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The Portland State University Bulletin is not a contract but rather a guide for the convenience of students. The University reserves the right to change or withdraw courses; to change the fees, rules, and calendar for admission, registration, instruction, and graduation; and to change other regulations affecting the student body, at any time.

Portland State University supports equal opportunity in admissions, education, employment, housing, and use of facilities by prohibiting discrimination in those areas based on age, color, disability, marital status, national origin, race, religion or creed, sex or gender, sexual or gender identity, sexual orientation, veteran status, or any other basis in law. This policy implements state and federal laws (including Title IX); inquires about it should be directed to the Office of Diversity and Inclusion, 1600 SW Fourth Avenue, Suite 830, 503-725-4417; TTY: 503-725-6503.

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COURSE NUMBERING SYSTEM.

Courses are numbered as follows:

0 - 99  Noncredit courses or credit courses of a remedial, terminal, or semiprofessional nature not applicable toward degree requirements.

100 - 299  Courses on the lower-division level.

300 - 499  Courses on the upper-division level.

4xx/5xx  Master's level graduate courses which are also offered as courses for undergraduates.

5xx  Graduate courses offered in support of master’s degree level instructional programs. Ordinarily employed for units whose majors have access to master’s programs or for courses populated by master’s students.

5xx/6xx  Graduate courses offered in support of doctoral degree level instructional programs which are also offered as courses for master’s level students.

6xx  Graduate courses offered in support of doctoral degree level instructional programs. Ordinarily employed for units whose majors have access to doctorate programs or for courses populated by doctorate students.

7xx  Postbaccalaureate courses which may not be applied toward an academic degree.

8xx  In-service courses with limited application toward advanced degrees and no application toward undergraduate degrees.

In addition, the following number system is generally in effect in all Oregon public institutions: 100 to 110 and 200 to 210 courses are survey or foundation courses in the liberal arts and sciences in the disciplines covered.

The following numbered courses are repeating courses (they may be taken for more than one term under the same number), with credit being granted according to the amount of work done:

- 199, 299, 399, Special Studies;
- 401, 501, 601, 801, Research;
- 402, 502, 602, 802, Independent Study;
- 403 Honors Thesis; 503 Thesis/603 Dissertation;
- 404, 504, 604, 804, Cooperative Education/Internship;
- 405, 505, 605, 805, Reading and Conference;
- 406, 506, 606, 806, Problems/Projects;
- 407, 507, 607, 807, Seminar;
- 408, 508, 608, 808, Workshop;
- 409, 509, 609, 809, Practicum;
- 410, 510, 610, 810, Selected Topics.

Other repeating numbers are assigned to activity courses, such as art, music, and physical education.

Certain senior level courses are taught concurrently with their graduate-level counterparts. Hence this course may be offered for either graduate or undergraduate credit. (See quarterly Schedule of Classes for specific offering.) In the graduate credit course, additional work appropriate to the graduate level of study will be assigned.
COURSES

Actg - Accounting

Actg 199 - Special Studies (1-3)
(Credit to be arranged.) Often offered as Debits and Credits, recommended for accounting majors.

Actg 281 - Accounting Mechanics: Debits and Credit (1)
Focus on the mechanics of the accounting cycle using an interactive, online, problem-oriented learning system. Specific topics include use of T-accounts, rules of Debits/Credits, journal entries, adjusting and closing entries, and subsequent preparation of financial statements.
Prerequisite: BA 211.

Actg 310 - Professional Accounting Seminar (2)
Designed to introduce students to a wide range of accounting careers. Guest speakers from public accounting firms, private industry, and governmental agencies will provide information and discuss various career paths within their organizations. In addition, information on how to find and get the "right" job will be provided. Pass/no pass only.
Prerequisite: B or better in both BA 211 and 213 or consent of instructor.

Actg 335 - Accounting Information Systems (4)
Methodology used in manual and computer systems for the accumulation, classification, processing, analysis, and communication of accounting data. Development of the accounting techniques used in the handling of large amounts of information; special journals and controlling accounts; computer files for storing data; computer processing of data. Discussion of the problems encountered in the systems for different types of organizations.
Prerequisite: BA 213, BA 325, Stat 244 and Ec 202.

Actg 360 - Management Accounting (4)
Emphasis on the development, analysis, and communication of cost information relevant to the following functions: planning, decision making, cost control and management, pricing, and performance evaluation.
Prerequisite: BA 213, Stat 244 and Ec 202.

Actg 381 - Financial Accounting and Reporting I (4)
Comprehensive study of the principles, conventions and postulates of financial accounting. Appropriate preparation of GAAP financial statements and financial disclosures, including exposure to the judgment inherent in financial reporting. Considers information requirements and expectations of users of financial statements. International financial accounting standards will be considered where appropriate. Specific focus on the responsibility of accountants for maintaining professional accountability to the public interest in the face of institutional pressures. This is the third course in a sequence of three: Actg 381, Actg 382, and Actg 383 which must be taken in sequence.
Prerequisite: Actg 382.

Actg 382 - Financial Accounting and Reporting II (4)
Comprehensive study of the principles, conventions and postulates of financial accounting. Appropriate preparation of GAAP financial statements and financial disclosures, including exposure to the judgment inherent in financial reporting. Considers information requirements and expectations of users of financial statements. International financial accounting standards will be considered where appropriate. Specific focus on the responsibility of accountants for maintaining professional accountability to the public interest in the face of institutional pressures. This is the second course in a sequence of three: Actg 381, Actg 382, and Actg 383 which must be taken in sequence.
Prerequisite: BA 213, Stat 244, and Ec 202.

Actg 383 - Financial Accounting and Reporting III (4)
Comprehensive study of the principles, conventions and postulates of financial accounting. Appropriate preparation of GAAP financial statements and financial disclosures, including exposure to the judgment inherent in financial reporting. Considers information requirements and expectations of users of financial statements. International financial accounting standards will be considered where appropriate. Specific focus on the responsibility of accountants for maintaining professional accountability to the public interest in the face of institutional pressures. This is the third course in a sequence of three: Actg 381, Actg 382, and Actg 383 which must be taken in sequence.
Prerequisite: Actg 381.

Actg 399 - Special Studies (1-6)
(Credit to be arranged.)

Actg 401 - Research (1-6)
(Credit to be arranged.)

Actg 404 - Internship (1-6)
(Credit to be arranged.) Consent of instructor.

Actg 405 - Reading and Conference (1-6)
(Credit to be arranged.)

Actg 406 - Special Projects (1-12)
Credit to be arranged.

Actg 407 - Seminar (1-6)
(Credit to be arranged.) Student-selected problems in business operation and business management to be studied by the individual and discussed in group meeting under direction of academic staff.

Actg 409 - Practicum (1-8)
(Credit to be arranged.)

Actg 410 - Selected Topics (1-6)
(Credit to be arranged.)

Actg 421 - Introduction to Taxation (4)
Introduces students to a broad range of tax concepts, tax policies, and different types of taxpayers. Students should develop an understanding of how tax laws affect most business and personal financial decisions. Tax reporting, tax planning, and basic tax research skills will be emphasized.
Actg 422 - Advanced Taxation (4)
Expands students' knowledge of how tax laws affect sole proprietors, partnerships, corporations, and other business entities. In addition, the tax laws applicable to estates, gifts, trusts, tax exempt organizations, and foreign persons are explored. Also offered for graduate-level credit as Actg 522 and may be taken only once for credit.
Prerequisite: Actg 421.

Actg 430 - Governmental and Not-for-Profit Accounting (2)
An introduction to governmental and "fund" accounting. Topics include state and local governmental funds and accounting for not-for-profit hospitals, universities, and health/welfare organizations.
Prerequisite: Actg 382.

Actg 445 - Forensic Accounting (4)
Introduces forensic and investigative accounting. Develops working knowledge of the fraud environment, fraud schemes, fraud prevention and detection controls, fraudster characteristics, interviews and evidence techniques, the legal system and process for litigation and mediation, how to testify in various trials, and how to conduct and write up a fraud investigation. Also offered for graduate-level credit as Actg 545 and may be taken only once for credit.
Prerequisite: Actg 381.

Actg 460 - Advanced Managerial Accounting (4)
Advanced development, analysis, and communication of cost information, focusing on the use of financial and non-financial information in decision making and strategic management. Cases and/or simulations will be used extensively.
Prerequisite: Actg 360.

Actg 485 - Business Law (4)
Laws of contracts, negotiable checks, notes, and drafts, insurance, documents of title, sales of goods, letters of credit, employees and independent contractors, agency, partnership, corporations, securities, bankruptcy, security interests, mortgages, suretyship and bulk sales. Covers law part of CPA exam. Also offered for graduate-level credit as Actg 585 and may be taken only once for credit.
Prerequisite: BA 213, Stat 244 and Ec 202.

Actg 490 - Advanced Financial Accounting (2)
Emphasizes accounting for business combinations, stock ownership investments and financial consolidations.
Prerequisite: Upper-division standing.

Actg 492 - Auditing Concepts and Practices (4)
Auditing standards and procedures observed by Certified Public Accountants in the examination of the financial statements of business and other organizations. Audit standards and objectives and conceptual framework for collection of evidence and assessment of control risk. Shortform audit report and operational auditing. Also offered for graduate-level credit as Actg 592 and may be taken only once for credit.
Prerequisite: Actg 335 and Actg 382.

Actg 493 - Advanced Auditing (4)
Audit objectives and procedures for the collection of evidence and the assessment of control risk are explored. The effects of attribute and variables sampling as well as the effects of computers and computer-control procedures on the audit process are examined. In addition, audit, compilation, and review reports are important elements of this course. Also offered for graduate-level credit as Actg 593 and may be taken only once for credit.
Prerequisite: Actg 492.

Actg 495 - Integrated Accounting Issues (4)
Integrates topics from various accounting areas. Provides students with opportunities to see the accounting interactions and tradeoffs that result from realistic business situations. Course will enhance students' understanding of accounting and its influence on business, as well as the understanding of how business processes affect accounting results, through a set of comprehensive case studies.
Prerequisite: Actg 360, Actg 421, Actg 492.

Actg 501 - Research (1-9)
(Credit to be arranged.)

Actg 503 - Thesis (1-9)
(Credit to be arranged.)

Actg 504 - Internship (1-9)
(Credit to be arranged.)

Actg 505 - Reading and Conference (1-6)
(Credit to be arranged.) Consent of instructor.

Actg 507 - Seminar (1-6)
(Credit to be arranged.) Student-selected problems in business operation and business management to be studied by the individual and discussed in group meeting under direction of academic staff.

Actg 507S - Seminar (1-8)
(Credit to be arranged.) Student-selected problems in business operation and business management to be studied by the individual and discussed in group meeting under direction of academic staff.

Actg 509 - Practicum (1-9)
(Credit to be arranged.)

Actg 510 - Selected Topics (1-6)
(Credit to be arranged.)

Actg 511 - Financial Accounting (4)
An introduction to the reporting system used by businesses to convey financial information to parties external to the enterprise. Primary emphasis is placed on understanding the financial reports that are the end product of this system—what they do and do not tell the user about a business enterprise. The accounting principles, conventions, and concepts underlying financial reporting are examined with the objective of developing the ability to read, comprehend, and perform a basic analysis of financial statements. An introduction to environment performance reporting also will be provided. Ethics are essential in accounting and provide guidance on all aspects of financial reporting topics covered in this course.

Actg 512 - Managerial Accounting and Control (2)
Course participants study traditional managerial accounting issues, including operational budgeting, cash flow analysis and cost accounting. In addition, the course will consider financial models used in analyzing the economic viability of new products and services. Concurrent or
Prerequisite: Actg 511.
Actg 512S - Business Law (4)
Laws of contracts, negotiable checks, notes, and drafts, insurance, documents of title, sales of goods, letters of credit, employees and independent contractors, agency, partnership, corporations, securities bankruptcy, security interests, mortgages, suretyship and bulk sales. Covers law part of CPA exam.
Prerequisite: Fin 226 or BA 385 (Fin 226 or BA 385 not required for students in postbaccalaureate certificate in accounting program) or Mgmt 560.

Actg 522 - Advanced Taxation (4)
Expands students' knowledge of how tax laws affect sole proprietors, partnerships, corporations, and other business entities. In addition, the tax laws applicable to estates, gifts, trusts, tax exempt organizations, and foreign persons are explored. Also offered for undergraduate-level credit as Actg 422 and may be taken only once for credit.
Prerequisite: Actg 421.

Actg 522S - Advanced Taxation (4)
Expands students' knowledge of how tax laws affect sole proprietors, partnerships, corporations, and other business entities. In addition, the tax laws applicable to estates, gifts, trusts, tax exempt organizations, and foreign persons are explored.
Prerequisite: Actg 421.

Actg 525 - Professional Accounting Research (4)
This course covers the research and documentation methods used in professional practice by accountants. Topics generally include use of the research tools and methods used by professional accountants, including documenting and communicating research.

Actg 527 - Advanced Tax Topics (4)
The study of federal income tax law applicable to common business structures through the use of case studies. Topics generally include the tax treatment of business formation, operations, distributions, liquidations, mergers and acquisitions. Applying tax laws, performing analyses, and making judgments are critical in this case course. Expected preparation: Actg 422 or Actg 522 or equivalent.

Actg 542 - Tax Factors in Business Decisions (4)
Tax implications of common business questions and transactions, including choices of business entity, acquisition and sale of business assets, compensation and benefits planning, and U.S. taxation of international trade. Students will be exposed to the common income and estate tax planning strategies of individuals and families engaged in business.
Prerequisite: Actg 512 or admission to the Master of Science in financial analysis program.

Actg 545 - Forensic Accounting (4)
Introduces forensic and investigative accounting. Develops working knowledge of the fraud environment, fraud schemes, fraud prevention and detection controls, fraudster characteristics, interview and evidence techniques, the legal system and process for litigation and mediation, how to testify in various trials, and how to conduct and write up a fraud investigation. Also offered for undergraduate-level credit as Actg 445 and may be taken only once for credit.
Prerequisite: Actg 381.

Actg 546 - Strategic Cost Management (4)
Prerequisite: Actg 421.

Actg 550 - Advanced Financial Reporting (4)
Prerequisite: Actg 511.

Actg 551 - Accounting Information Systems (4)
Study of accounting information systems for operations with an emphasis on accounting issues. Addresses the information systems issues encountered by internal financial analysts. Topics may include database and accounting information system design, model building, the use of accounting information for forecasting, and other topics associated with the development of information systems to support financial analysis.

Actg 552 - Strategic Cost Management (4)
Course takes the perspective that managers should not use information from accounting systems designed to prepare external financial reports in order to make internal management decisions. Provides alternative approaches to developing and using accounting information. Special emphasis will be placed on understanding traditional cost systems, activity-based costing systems, and determining the cost of quality. Course will rely heavily on the examination of actual company situations.
Prerequisite: Actg 512 or admission to the Master of Science in financial analysis program.

Actg 553 - Financial Statement Analysis (4)
Sound financial information for making business decisions is obtained by an understanding of accounting data from which the information is derived as well as by the application of tools of analysis. Students will gain an increased understanding of the properties and use of accounting numbers in the determination and forecasting of financial positions, results of operations, cash flows, the financial disclosure process, and its use in comparing business performance.
Prerequisite: Fin 551 or concurrent enrollment or Fin 561.

Actg 560 - Professional Ethics and the Public Interest (2)
Introduces students to ethical perspectives that provide the philosophical context for the study of applied business ethics. Students use practical frameworks to address complex ethical and social issues and explore organizational processes and structures that can shape social performances. The context for this course is financial and accounting situations.

Actg 565 - Current Topics in Global Financial Accounting (4)
Covers current complex financial accounting issues faced by corporations operating within a global context. Because of today's rapidly changing financial accounting environment, this course will take an adaptable view of topics covered, monitoring recent regulatory issues to include timely complex issues that must be understood by today's financial accounting professional.
Prerequisite: admission to the MSFA program.
control risk are explored. The effects of collection of evidence and the assessment of Audit objectives and procedures for the
Audit objectives and procedures for the collection of evidence and the assessment of control risk are explored. The effects of attribute and variables sampling as well as the effects of computers and computer-control procedures on the audit process are examined. In addition, audit, compilation, and review reports are important elements of this course. Also offered for undergraduate-level credit as Actg 493 and may be taken only once for credit.

Prerequisite: Actg 492.

Actg 593S - Business Law (4)

Laws of contracts, negotiable checks, notes, and drafts, insurance, documents of title, sales of goods, letters of credit, employees and independent contractors, agency, partnership, corporations, securities, bankruptcy, security interests, mortgages, suretyship and bulk sales. Covers law part of CPA exam. Also offered for undergraduate-level credit as Actg 485 and may be taken only once for credit.

Prerequisite: Fin 226 or BA 385 (Fin 226 or CPA exam. Also offered for undergraduate-level credit as Actg 485 and may be taken only once for credit.

Actg 592 - Auditing Concepts and Practices (4)

Auditing standards and procedures observed by Certified Public Accountants in the examination of the financial statements of business and other organizations. Audit standards and objectives and conceptual framework for collection of evidence and assessment of control risk. Shortform audit report and operational auditing. Also offered for undergraduate-level credit as Actg 492 and may be taken only once for credit.

Prerequisite: Actg 335 and Actg 382.

Actg 592S - Auditing Concepts and Practices (4)

Auditing standards and procedures observed by Certified Public Accountants in the examination of the financial statements of business and other organizations. Audit standards and objectives and conceptual framework for collection of evidence and assessment of control risk. Shortform audit report and operational auditing.

Prerequisite: Actg 335 and 382.

Actg 593 - Advanced Auditing (4)

Audit objectives and procedures for the collection of evidence and the assessment of control risk are explored. The effects of movement in the Fourth World; racism; and sexism.

Anth 300U - The Modern World in Anthropological Perspective (4)

Examination of anthropological approaches to cultural diversity in a global context. Include cultural contact between the Fourth World and the industrialized world; health, nutrition, and poverty in different world areas; ecocide and ethnocide; political movements in the Fourth World; racism; and sexism.

Anth 301 - Culture and Ethnography (4)

Cultural diversity and contemporary social issues examined through a series of ethnographic studies that highlight the methodology and efficacy of ethnographic research. Topics may include, but will not be limited to, issues to identity formation, gender, political economy, and transnational culture flows.

Anth 304 - Social Theory (4)

Examines social organization at various levels, from the family on up to the global economy. Theoretical perspectives span classic social theory, the ethnographic tradition, and hybrid approaches used by present-day anthropologists. Topics include power, identity, agency, social change, and globalization, with an emphasis on understanding contemporary social issues in cross-cultural perspective. Designed for anthropology majors and minors. Note: This course is not approved for distribution credits. Expected preparation: Anth 103.

Anth 305 - Cultural Theory (4)

Examines social organization at various levels, from the family on up to the global economy. Theoretical perspectives span classic social theory, the ethnographic tradition, and hybrid approaches used by present-day anthropologists. Topics include power, identity, agency, social change, and globalization, with an emphasis on understanding contemporary social issues in cross-cultural perspective. Designed for anthropology majors and minors. Note: This course is not approved for distribution credits. Expected preparation: Anth 103.

Anth 310 - Chinese Culture and Society (4)

Recent issues in contemporary Chinese culture and society including rural and urban transformations, minority representations, gender shifts, religious and resistance movements and other trends. Most years will focus on PRC but may also include Hong Kong and Taiwan.
Anth 310 - Peoples and Cultures of Latin America (4)
Introduction to the peoples and cultures of Latin America, including Mexico, Central and South America, and the Caribbean. Course topics include religion, ecology, race and ethnicity, gender, urbanization, conflict, and social change.

Anth 311U - Peoples and Cultures of Latin America (4)
Introduction to the peoples and cultures of Latin America, including Mexico, Central and South America, and the Caribbean. Course topics include religion, ecology, race and ethnicity, gender, urbanization, conflict, and social change.

Anth 315 - American Culture (4)
Central beliefs and core values of modern American society are examined from an anthropological perspective. Considers: value of constructs such as individualism and conformity; creation of public images; kinship and friendship; privacy; schools and neighborhoods; and conflicts involving ethnicity, social class, and gender. Questions the role of culture in our own lives, thereby gaining a greater understanding of social experience and of the concept of culture.

Anth 315U - American Culture (4)
Central beliefs and core values of modern American society are examined from an anthropological perspective. Considers: value of constructs such as individualism and conformity; creation of public images; kinship and friendship; privacy; schools and neighborhoods; and conflicts involving ethnicity, social class, and gender. Questions the role of culture in our own lives, thereby gaining a greater understanding of social experience and of the concept of culture.

Anth 317 - Peoples and Cultures of South Asia (4)
Introduction to the peoples and cultures of South Asia, the area encompassed by India, Pakistan, Sri Lanka, Nepal, Bangladesh, Butan and the Maldives. Topics include cultural diversity, religious traditions, the caste system, class and gender hierarchies, and social change.

Anth 317U - Peoples and Cultures of South Asia (4)
Introduction to the peoples and cultures of South Asia, the area encompassed by India, Pakistan, Sri Lanka, Nepal, Bangladesh, Butan and the Maldives. Topics include cultural diversity, religious traditions, the caste system, class and gender hierarchies, and social change.

Anth 318 - Asian American Experience (4)
Explores the contemporary experiences of Asian immigrants to the United States, focusing on issues of migration, family adjustments, community formations, and identity constructions among diverse groups of Asians including Chinese, Japanese, Korean, Filipino, Vietnamese, South Asians, and others. Recommended: Anth 103.

Anth 318U - Asian American Experience (4)
Explores the contemporary experiences of Asian immigrants to the United States, focusing on issues of migration, family adjustments, community formations, and identity constructions among diverse groups of Asians including Chinese, Japanese, Korean, Filipino, Vietnamese, South Asians, and others. Recommended: Anth 103.

Anth 319U - Traditional Cultures of Africa (4)
A survey of the culture history and characteristics of the traditional (before Western influence) cultures of African peoples.

Anth 319 - Traditional Cultures of Africa (4)
A survey of the culture history and characteristics of the traditional (before Western influence) cultures of African peoples.

Anth 320 - Native Americans of the Northwest Coast (4)
Native Americans of the Pacific Northwest coast are among the most affluent, diverse, and complex hunting-gathering peoples in the world. This course examines the unity and diversity of these cultures from Alaska to the Oregon-California border by tracing their historical evolution and responses to contemporary problems. Topics include: subsistence economies and resource tenure, social identity, art, ceremonial and spiritual life, culture change and revitalization, and modern indigenous-state relations. Recommended prerequisites: Anth 103, 314 or 313.

Anth 325 - Culture, Health, and Healing (4)
Introduction to the field of medical anthropology. Biocultural aspects of disease and healing. Comparison of healers and healing professions in Western and non-
Western societies. Interactions among culture, social relations, environment, and health. Topics include healers and healing roles, ethnomedicine and medical pluralism, clinical medical anthropology, and nutritional anthropology.

**Anth 325U - Culture, Health, and Healing (4)**

Introduction to the field of medical anthropology. Biocultural aspects of disease and healing. Comparison of healers and healing professions in Western and non-Western societies. Interactions among culture, social relations, environment, and health. Topics include healers and healing roles, ethnomedicine and medical pluralism, clinical medical anthropology, and nutritional anthropology.

**Anth 330 - Anthropology of Folklore (4)**

Review of folklore, including legend, folktales, music, and dance, and its role in society. Emphasis will be on the study of folklore by anthropologists in both western and non-western contexts. Explores how folklore can reveal social relations, conflict and resistance, social change and gender relations.

**Anth 330U - Anthropology of Folklore (4)**

Review of folklore, including legend, folktales, music, and dance, and its role in society. Emphasis will be on the study of folklore by anthropologists in both western and non-western contexts. Explores how folklore can reveal social relations, conflict and resistance, social change and gender relations.

**Anth 333 - Anthropology of Food (4)**

Explores biological and cultural aspects of past and present human food systems. Topics include nutrition, the cultural significance of food, domestication of plants and animals, archaeological records of competitive feasting, global movement of foods during the colonial period, new revolutions in food technology, the politics and economics of contemporary food systems, and eating disorders such as obesity, anorexia, and bulimia.

**Anth 335 - Anthropology of Space and Place (4)**

Space and place are foundational to human cognition, emotion, and experience, and yet we often take them for granted. This course examines the origins, development and contemporary variation of human senses of space, place, and environment in a variety of cultural settings around the world. Recommended: Anth 102.

**Anth 345 - Practicing Anthropology (4)**

Introduction to applied anthropology as a tool to address real world problems related to development, environment, human health, cultural resource management, conflict, and more. Includes creation of a personalized career plan which will assist in the transition from education to profession following the completion of an undergraduate degree in anthropology. Expected preparation: Anth 101, 102, 304 and 305.

**Anth 350 - Archaeological Method and Theory (4)**

A survey of current techniques and conceptual models applied in the discovery and analysis of archaeological materials. The fundamentals of archaeological research design, field survey, excavation, dating, cultural reconstruction, and the application of interdisciplinary studies.

**Anth 350U - Archaeological Method and Theory (4)**

A survey of current techniques and conceptual models applied in the discovery and analysis of archaeological materials. The fundamentals of archaeological research design, field survey, excavation, dating, cultural reconstruction, and the application of interdisciplinary studies. Recommended prerequisite: Anth 102.

**Anth 355 - Historical Archaeology and the Origins of the Modern Pacific Northwest (4)**

Explores the origins of the modern Pacific Northwest from fur-trade/indigenous contacts to the present using theories and methods of historical archaeology in North America and elsewhere. Topics include heritage, history, and interpretation; the archaeology of the fur trade; the industrial revolution and industrial archaeology; slavery and inequality; and military sites archaeology. Expected preparation: 350.

**Anth 355U - Historical Archaeology and the Origins of the Modern Pacific Northwest (4)**

Explores the origins of the modern Pacific Northwest from fur-trade/indigenous contacts to the present using theories and methods of historical archaeology in North America and elsewhere. Topics include heritage, history, and interpretation; the archaeology of the fur trade; the industrial revolution and industrial archaeology; slavery and inequality; and military sites archaeology. Expected preparation: 350.

**Anth 357 - Archaeology in Popular Culture (4)**

Study relationships between archaeology, archaeology in popular culture, and modern society. Build knowledge of science in archaeology through analysis of archaeological representations in popular culture (e.g. films, television).

**Anth 357U - Archaeology in Popular Culture (4)**

Study relationships between archaeology, archaeology in popular culture, and modern society. Build knowledge of science in archaeology through analysis of archaeological representations in popular culture (e.g. films, television).

**Anth 361 - The Archaeology of Europe (4)**

Methods and results of the study of ancient cultures of Europe from the earliest traces until the advent of written records. Expected preparation: Anth 350.

**Anth 361U - The Archaeology of Europe (4)**

Methods and results of the study of ancient cultures of Europe from the earliest traces until the advent of written records. Expected preparation: Anth 350.

**Anth 362 - African Prehistory (4)**

Methods, sources of evidence, and the results of the study of prehistoric cultures of Africa from the earliest traces until the first written records; it includes human origins (physical and cultural evolution), the earliest civilizations, peopling of Africa, migrations, earliest settlements, origins of agriculture.
Crosslisted as: BSt 362U.

Anth 362U - African Prehistory (4)
Methods, sources of evidence, and the results of the study of prehistoric cultures of Africa from the earliest traces until the first written records; it includes human origins (physical and cultural evolution), the earliest civilization, peopling of Africa, migrations, earliest settlements, origins of agriculture and metallurgy. This is the same course as BSt 362 and may be taken only once for credit.
Crosslisted as: BSt 362.

Anth 363 - Egyptian Archaeology: From Earliest Peoples to the Pyramid Age (4)
A survey of the archaeological record of Egypt beginning with the earliest evidence of human occupation to the Pyramid era, with an emphasis on the period from 6000 BCE to the end of the Old Kingdom period (ca 2000 BCE). Lectures and readings will focus on how archaeological materials are used to reconstruct events in Egypt's past.

Anth 363U - Egyptian Archaeology: From Earliest Peoples to the Pyramid Age (4)
A survey of the archaeological record of Egypt beginning with the earliest evidence of human occupation to the Pyramid era, with an emphasis on the period from 6000 BCE to the end of the Old Kingdom period (ca 2000 BCE). Lectures and readings will focus on how archaeological materials are used to reconstruct events in Egypt's past.

Anth 364 - The Archaeology of the Pacific Northwest (4)
A survey of the ancient cultures and societies of northwestern North America from its earliest peoples to the arrival of Europeans. Expected preparation: Anth 350.

Anth 364U - The Archaeology of the Pacific Northwest (4)
A survey of the ancient cultures and societies of northwestern North America from its earliest peoples to the arrival of Europeans. Expected preparation: Anth 350.

Anth 365 - The Archaeology of North America (4)
A survey of the ancient cultures and societies of North America north of Mexico, from the first ancient migrant populations and early hunter-gatherers to the complex agricultural societies encountered by 15th and 16th century European explorers. Expected preparation: Anth 350.

Anth 365U - The Archaeology of North America (4)
A survey of the ancient cultures and societies of North America north of Mexico, from the first ancient migrant populations and early hunter-gatherers to the complex agricultural societies encountered by 15th and 16th century European explorers. Expected preparation: Anth 350.

Anth 366 - The Archaeology of Mesoamerica (4)
Early cultures of Mesoamerica with an emphasis on the domestication of plants and animals and the development of civilization, focusing on the Maya and Highland Mexico. Expected preparation: Anth 350.

Anth 366U - The Archaeology of Mesoamerica (4)
Early cultures of Mesoamerica with an emphasis on the domestication of plants and animals and the development of civilization, focusing on the Maya and Highland Mexico. Expected preparation: Anth 350.

Anth 367 - The Archaeology of East Asia (4)
The archaeology of China, Japan, and Korea from about 1 million years ago to the establishment of the Yamato State in Japan. Focuses on developments during the past 18,000 years, including the domestication of plants and animals, the spread of agriculture, and the development of civilization and regional states. Expected preparation: Anth 350.

Anth 367U - The Archaeology of East Asia (4)
The archaeology of China, Japan, and Korea from about 1 million years ago to the establishment of the Yamato State in Japan. Focuses on developments during the past 18,000 years, including the domestication of plants and animals, the spread of agriculture, and the development of civilization and regional states. Expected preparation: Anth 350.

Anth 368 - The Archaeology of Oceania (4)
Reviews issues related to the peopling of Australia about 40,000 years ago, and subsequent voyaging and colonization of all parts of the South Pacific. Examines prehistoric cultural developments in Hawaii, New Zealand, Easter Island, and island groups in Micronesia. Examines evidence of human modification of island ecosystems. Expected preparation: Anth 350.

Anth 368U - The Archaeology of Oceania (4)
Reviews issues related to the peopling of Australia about 40,000 years ago, and subsequent voyaging and colonization of all parts of the South Pacific. Examines prehistoric cultural developments in Hawaii, New Zealand, Easter Island, and island groups in Micronesia. Examines evidence of human modification of island ecosystems. Expected preparation: Anth 350.

Anth 370 - Paleanthropology (5)
Method and theory in paleoanthropology. A study of hominoid and human evolution from the Miocene to modern times. Emphasis will be placed on the fossil record and the interactions between biology and culture in the evolution of the human species. Four hours lecture and one biweekly laboratory. Recommended prerequisite: Anth 101.
Corequisite: Anth 370L.

Anth 370L - Paleanthropology Laboratory (0)
Lab for Anth 370 Paleoanthropology.
Corequisite: Anth 370.

Anth 372 - Human Variability (4)
The causes and significance of biological variation in contemporary human populations genetic, environmental and cultural factors. Recommended prerequisite: Anth 101.

Anth 373 - Primate Ecology and Behavior (4)
Study of origins, diversity, ecology, behavior, and conservation of living non-human primates. Primate ecology and behavior are explored from a comparative and evolutionary perspective. Emphasis is on primates in natural habitats rather than in captive settings, spanning apes, monkeys, and prosimians. Recommended prerequisite: Anth 101.
Anth 379 - Practicing Forensic Science (4)
Survey of topics in forensic science: DNA, drug chemistry, toxicology, firearms, and latent prints. Focus on forensic anthropology and taphonomy, including assessment of age, sex, population-based skeletal variation, and effects of peri-/post-mortem environmental processes on forensic investigation. Course clarifies popular media misinformation with fact-based overview of real forensic analysis.
Prerequisite: Anth 101 or permission of instructor.

Anth 399 - Special Studies (1-12)
See department for course description.
(Credit to be arranged.)

Anth 399U - Special Studies (4)
Special Studies (Credit to be arranged.)

Anth 401 - Research (1-6)
See department for course description.
Consent of instructor. (Credit to be arranged.)

Anth 404 - Cooperative Education/Internship (1-12)
See department for course description.
(Credit to be arranged.)

Anth 405 - Reading and Conference (1-6)
See department for course description.
Consent of instructor. (Credit to be arranged.)

Anth 407 - Seminar (1-6)
See department for course description.
Consent of instructor. (Credit to be arranged.)

Anth 409 - Practicum (1-9)
(Credit to be arranged.)

Anth 410 - Selected Topics (1-6)
See department for course description.
Consent of instructor. (Credit to be arranged.)

Anth 412 - Research Methods in Social and Cultural Anthropology (4)
Methods and techniques of research involving primary contacts with people, institutions and communities. The initiating and developing of projects designed to produce data for basic ethnographic, as well as applied, anthropological research. Also offered for graduate-level credit as Anth 512 and may be taken only once for credit. Expected preparation: 12 credits in anthropology (Anth 304, 305 strongly recommended).

Anth 414 - Culture and Ecology (4)
A critical analysis of the interrelations of culture, social structure, and human ecology. Social organization as influenced by characteristic patterns of resource exploitation. The uses of natural environment from the viewpoint of the members of societies. Also offered for graduate-level credit as Anth 514 and may be taken only once for credit. Expected preparation: Anth 304, 305.

Anth 415 - Applied Anthropology (4)
Examines theories, methods, and ethical considerations required to conduct applied anthropology in a variety of contexts. Students will carry out independent research on a real world problem linked with his/her career goal. Also offered for graduate-level credit as Anth 515 and may be taken only once for credit.
Prerequisite: Anth 304 or Anth 305.

Anth 416 - Urban Anthropology (4)
Cross-cultural examination of urban phenomena including: variability in cultural and institutional patterning of cities, acculturation processes affecting urban populations, migration and social accommodation of rural and tribal peoples to urban settings, and the varieties of new subcultures that emerge in urban society. Also offered for graduate-level credit as Anth 516 and may be taken only once for credit. Expected preparation: 8 credits in sociocultural anthropology or allied social science (Anth 304, 305 strongly recommended).

Anth 417 - Advanced Topics in Native American Studies (4)
In-depth examination of a current scholarly topic in the anthropology of native North America, especially in relation to colonialism and native resistance. Course will cover appropriate theory, as well as ethnographic and ethnohistorical materials. Also offered for graduate-level credit as Anth 517. Expected preparation: Anth 313 and 314 or two courses on Native Americans in any department.

Anth 418 - Environmental Anthropology (4)
What can anthropology teach us about contemporary environmental problems? Emphasizing key issues of environmental change, adaptation, conservation and sustainability, biocultural diversity, resilience, political ecology, and environmental justice, this course examines how the cross-cultural study of human-environmental relations can improve our understanding of contemporary environmental problems and their solutions. Also offered for graduate-level credit as Anth 518 and may be taken only once for credit. Expected preparation: Anth 102, 103, 301 or 304, 414/514.

Anth 422 - Contemporary American Indian Policy (4)
An examination of current federal, state, and tribal law and policy pertaining to Indian affairs, including tribal government organization, government-to-government relations, economic development, natural and cultural resource management, health care, welfare, and education. Both reservation communities and the Portland metropolitan Indian community are considered. Student research is based on reading, field trips, and interviews with tribal officials and other policy professionals. Also offered for graduate-level credit as Anth 522 and may be taken only once for credit. Expected preparation: Anth 313, and Anth 314.

Anth 425 - Perspectives in Medical Anthropology (4)
Examination of critical, interpretive, and ecological perspectives in medical anthropology. Anthropological study of practice of biomedicine in the United States, and response to global diseases, including AIDS. Topics include the new medical technologies, social meanings of the body, bioethics, and the medicalization of social problems. Also offered for graduate-level credit as Anth 525 and may be taken only once for credit. Expected preparation: Anth 325 or 8 credits of socio-cultural anthropology.

Anth 426 - Transnationalism and Migration (4)
In-depth exploration of globalization, transnationalism, and migration. Topics include colonialism and the history of world connections, the global economic system,
Anth 428 - Political Anthropology (4)
Survey of major anthropological approaches to politics and power. Coverage includes structural functionalism, evolutionism, action theory, structuralism, political economy, and post-structuralism. Ethnographic cases include both primitive politics and contemporary ethnic, class, and gender struggles in heterogeneous societies. Also offered for graduate-level credit as Anth 528 and may be taken only once for credit. Expected preparation: 8 credits in sociocultural anthropology (Anth 304, 305 strongly recommended).

Anth 430 - Myth, Ritual, and Symbol (4)
A critical examination of both classic and recent anthropological theories in the cross-cultural study of symbolic forms. Also offered for graduate-level credit as Anth 530 and may be taken only once for credit. Expected preparation: 8 credits in sociocultural anthropology (Anth 304, 305 strongly recommended).

Anth 431 - Advanced Topics in Latin American Anthropology (4)
In-depth exploration of a current topic in Latin American anthropology, especially in relation to the study of social change. Course materials will cover both theory and ethnography. Also offered for graduate-level credit as Anth 531. Expected preparation: either Anth 311 or two courses related to Latin America.

Anth 432 - Gender in Cross-Cultural Perspective (4)
A cross-cultural examination of sex roles and gender beliefs including political, social, economic, and ideological aspects of the position of the sexes. Also offered for graduate-level credit as Anth 532 and may be taken only once for credit. Expected preparation: upper-division standing and at least one basic course in sociocultural anthropology (Anth 103, Anth 304, or Anth 305).

Anth 435 - Visual Anthropology (4)
Examination of visual representation and visual research in Sociocultural Anthropology with a focus on photographic images, ethnographic films, and mass media. Also offered for graduate-level credit as Anth 535 and may be taken only once for credit. Expected preparation: 8 credits of sociocultural anthropology (Anth 304, Anth 305 strongly recommended). Upper-division standing required.

Anth 447 - Advanced Topics in South Asian Anthropology (4)
In-depth exploration of a current topic in South Asian anthropology, especially in relation to social change, nationalism and conflict, colonialism, or modernization. Course materials will cover both theory and ethnography. Also offered for graduate-level credit as Anth 547. Expected preparation: either Anth 317 or two related courses in Asian studies. (Anth Anth 304, Anth 305 strongly recommended.)

Anth 451 - History of Archaeology (4)
A chronological survey of developments in the field of archaeological inquiry: major schools of thoughts, innovations in method and theory, key personalities and their contributions. Also offered for graduate-level credit as Anth 551 and may be taken only once for credit. Prerequisite: Anth 350.

Anth 452 - Archaeological Lab Methods (4)
Techniques and their applications in the analysis of materials recovered from archaeological sites. Course content will vary, emphasizing the study of various artifact types—lithics, ceramics, textiles, botanical remains, etc. Also offered for graduate-level credit as Anth 552 and may be taken only once for credit. Prerequisite: Anth 350.

Anth 453 - Archaeological Field Methods (4)
The theory and practice of contemporary archaeological field investigation-research design, survey and reconnaissance, site excavation, sampling and recording techniques, cultural resource management. Also offered for graduate-level credit as Anth 553 and may be taken only once for credit. Prerequisite: Anth 350.

Anth 454 - Archaeological Field School (6)
Scientific excavation of archaeological sites or reconnaissance, survey and mapping of sites during a summer field project. Approximately 40 hours of field work per week, with a week of laboratory work. Also offered for graduate-level credit as Anth 554 and may be taken only once for credit. Prerequisite: admission to course is by permission of instructor via an application process.

Anth 455 - Analysis of Faunal Remains (5)
Reviews issues of recovery, identification, quantification, and interpretation of archaeological faunal remains. Seminar component involves discussion and critical review of recent faunal studies. Laboratory component introduces student to skeletal anatomy of vertebrates (with focus on fishes and mammals) and basic procedures used in faunal analysis. Also offered for graduate-level credit as Anth 555 and may be taken only once for credit. Prerequisite: Anth 350.

Anth 456 - Issues in Cultural Resource Management (4)
Examines the current cultural, legal and regulatory issues, problems, and frameworks affecting the management of cultural resources in North America and elsewhere in the world. Course coverage will include such topics as the laws affecting antiquities trafficking, and the relationships between indigenous peoples and archaeologists. Also offered for graduate-level credit as Anth 556. Prerequisite: Anth 350.

Anth 457 - Hunter-Gatherers (4)
An investigation of the economic and social diversity among modern and ancient hunter-gatherers and the theories and methods used by archaeologists to investigate and explain that diversity. Examines topics such as the evolution of hunting and gathering, hunter-gatherer settlement and mobility strategies, social complexity among hunter-gatherers and hunter-gatherers in the modern world. Also offered for graduate-level credit as Anth 557 and may be taken only once for credit. Prerequisite: Anth 350.
Anth 458 - Past Human-Environment Interactions (4)

This course introduces students to major theoretical approaches and topics within the archaeological study of past human-environment interactions, including application of archaeological research to contemporary human-environment issues. Also offered for graduate-level credit as Anth 558 and may be taken only once for credit. 

Prerequisite: Anth 350.

Anth 461 - Advanced Topics in Archaeology (4)

In-depth exploration and analysis of a major current problem in archaeology. Problems may be substantive or theoretical. Also offered for graduate-level credit as Anth 561.

Prerequisite: Anth 350.

Anth 464 - Topics in Northwest Archaeology (4)

In-depth exploration of current problems in the study of Northwest Prehistory, particularly as it articulates with general theories of hunter-gatherer adaptations and cultural evolution. Also offered for graduate-level credit as Anth 564. Expected preparation: Anth 364.

Prerequisite: Anth 350.

Anth 471 - Advanced Topics in Paleoanthropology (4)

In-depth exploration and analysis of current problems in the study of Paleoanthropology. Emphasis on articulation of evolutionary theory with fossils and other relevant evidence. Also offered for graduate-level credit as Anth 571. Expected preparation: Anth 370.

Anth 472 - Population Dynamics (4)

The study of the principles of Mendelian and population genetics as they apply to the evolution of human populations and the maintenance of diversity in modern populations. Emphasis also is placed on the articulation of genetic methods with evolutionary theory. Also offered for graduate-level credit as Anth 572 and may be taken only once for credit. Expected preparation: Anth 372; 2 years of high school algebra or equivalent; Bi 341 as a pre-or corequisite.

Anth 477 - Primatology Field Methods (4)

Focus on methods for collecting behavioral and ecological data on free-ranging primates through a combination of field exercises and lectures. Curriculum includes development of ethograms, sampling methods and recording rules, mapping, and estimating resource availability. Students learn methods within a natural reserve setting populated by living primates. Also offered for graduate-level credit as Anth 577 and may be taken only once for credit.

Prerequisite: Anth 101 or permission of instructor.

Anth 478 - Human Osteology (4)

The identification and interpretation of human skeletal material from archaeological sites: the determination of age, gender, and population affinity; an introduction to paleopathology and the recognition of genetic and cultural variation. Also offered for graduate-level credit as Anth 578 and may be taken only once for credit. Expected preparation: Anth 350 and Anth 370.

Anth 479 - Forensic Anthropology (2)

Advanced techniques of human skeletal identification and their application to the solution of medico-legal (forensic) problems. Also offered for graduate-level credit as Anth 579 and may be taken only once for credit. Expected preparation: Anth 478/578 or consent of instructor.

Anth 490 - The Anthropology of Violence (4)

Theoretical and ethnographic exploration of the nature of violence. Topics include identity politics and nationalism; the biology of aggression and the cultural meanings of pain; state violence; symbolic and structural violence; and human rights. Also offered for graduate-level credit as Anth 590 and may be taken only once for credit. Expected preparation: Anth 490/590 or consent of instructor.

Anth 491 - Culture and Ecology (4)

A critical analysis of the interrelations of culture, social structure, and human ecology. Social organization as influenced by characteristic patterns of resource exploitation. The uses of natural environment from the viewpoint of the members of societies. Also offered for
undergraduate-level credit as Anth 418 and may be taken only once for credit. Expected preparation: Anth 102, 103, 301 or 304, 414/514.

**Anth 522 - Contemporary American Indian Policy (4)**
An examination of current federal, state, and tribal law and policy pertaining to Indian affairs, including tribal government organization, government-to-government relations, economic development, natural and cultural resource management, health care, welfare, and education. Both reservation communities and the Portland metropolitan Indian community are considered. Student research is based on reading, field trips, and interviews with tribal officials and other policy professionals. Also offered for undergraduate-level credit as Anth 422 and may be taken only once for credit. Expected preparation: Anth 313, and Anth 314.

**Anth 525 - Perspectives in Medical Anthropology (4)**
Examination of critical, interpretive, and ecological perspectives in medical anthropology. Anthropological study of practice of biomedicine in the United States, and response to global diseases, including AIDS. Topics include the new medical technologies, social meanings of the body, bioethics, and the medicalization of social problems. Also offered for undergraduate-level credit as Anth 425 and may be taken only once for credit. Expected preparation: Anth 325 or 8 credits of socio-cultural anthropology.

**Anth 526 - Transnationalism and Migration (4)**
In-depth exploration of globalization, transnationalism, and migration. Topics include colonialism and the history of world connections, the global economic system, cultural imperialism, nationalism and identity, migration, refugees, tourism, and the commodification of local cultures. Also offered for undergraduate-level credit as Anth 426 and may be taken only once for credit. Expected preparation: 8 credits in socio-cultural anthropology (Anth 304, 305 strongly recommended).

**Anth 527 - Political Anthropology (4)**
Survey of major anthropological approaches to politics and power. Coverage includes structural functionalism, evolutionism, action theory, structuralism, political economy, and post-structuralism. Ethnographic cases include both primitive politics and contemporary ethnic, class, and gender struggles in heterogeneous societies. Also offered for undergraduate-level credit as Anth 427 and may be taken only once for credit. Expected preparation: 8 credits in socio-cultural anthropology (Anth 304, 305 strongly recommended).

**Anth 530 - Myth, Ritual, and Symbol (4)**
A critical examination of both classic and recent anthropological theories in the cross-cultural study of symbolic forms. Also offered for undergraduate-level credit as Anth 430 and may be taken only once for credit. Expected preparation: 8 credits in socio-cultural anthropology (Anth 304, 305 strongly recommended).

**Anth 531 - Advanced Topics in Latin American Anthropology (4)**
In-depth exploration of a current topic in Latin American anthropology, especially in relation to the study of social change. Course materials will cover both theory and ethnography. Also offered for undergraduate-level credit as Anth 431. Expected preparation: either Anth 311 or two courses related to Latin America.

**Anth 532 - Gender in Cross-Cultural Perspective (4)**
A cross-cultural examination of sex roles and gender beliefs including political, social, economic, and ideological aspects of the position of the sexes. Also offered for undergraduate-level credit as Anth 432 and may be taken only once for credit. Expected preparation: upper-division standing and at least one basic course in sociocultural anthropology (Anth 103, Anth 304, or Anth 305).

**Anth 533 - Visual Anthropology (4)**
Examination of visual representation and visual research in Sociocultural Anthropology with a focus on photographic images, ethnographic films, and mass media. Also offered for undergraduate-level credit as Anth 433 and may be taken only once for credit. Expected preparation: 8 credits of sociocultural anthropology (Anth 304, Anth 305 strongly recommended). Upper-division standing required.
Anth 547 - Advanced Topics in South Asian Anthropology (4)
In-depth exploration of a current topic in South Asian anthropology, especially in relation to social change, nationalism and conflict, colonialism, or modernization. Course materials will cover both theory and ethnography. Also offered for undergraduate-level credit as Anth 447.
Expected preparation: either Anth 317 or two related courses in Asian studies. (Anth Anth 304, Anth 305 strongly recommended.)
Prerequisite: Graduate standing or instructor permission.

Anth 550 - Core Seminar in Archaeology (4)
A seminar that provides a methodological, theoretical, and substantive review and integration of anthropological materials in archaeology.
Prerequisite: graduate standing in anthropology and consent of instructor.

Anth 551 - History of Archaeology (4)
A chronological survey of developments in the field of archaeological inquiry: major schools of thoughts, innovations in method and theory, key personalities and their contributions. Also offered for undergraduate-level credit as Anth 451 and may be taken only once for credit.
Prerequisite: Graduate standing or instructor permission.

Anth 552 - Archaeological Lab Methods (4)
Techniques and their applications in the analysis of materials recovered from archaeological sites. Course content will vary, emphasizing the study of various artifact types-lithics, ceramics, textiles, botanical remains, etc. Also offered for undergraduate-level credit as Anth 452 and may be taken only once for credit.
Prerequisite: Graduate standing or instructor permission.

Anth 553 - Archaeological Field Methods (4)
The theory and practice of contemporary archaeological field investigation-research design, survey and reconnaissance, site excavation, sampling and recording techniques, cultural resource management. Also offered for undergraduate-level credit as Anth 453 and may be taken only once for credit.
Prerequisite: Graduate standing or instructor permission.

Anth 554 - Archaeological Field School (6)
Scientific excavation of archaeological sites or reconnaissance, survey and mapping of sites during a summer field project. Approximately 40 hours of field work per week, with a week of laboratory work. Also offered for undergraduate-level credit as Anth 454 and may be taken only once for credit.
Prerequisite: admission to course is by permission of instructor via an application process.

Anth 555 - Analysis of Faunal Remains (5)
Reviews issues of recovery, identification, quantification, and interpretation of archaeological faunal remains. Seminar component involves discussion and critical review of recent faunal studies. Laboratory component introduces student to skeletal anatomy of vertebrates [with focus on fishes and mammals] and basic procedures used in faunal analysis. Also offered for undergraduate-level credit as Anth 455 and may be taken only once for credit.
Prerequisite: Graduate standing or instructor permission.

Anth 556 - Issues in Cultural Resource Management (4)
Examines the current cultural, legal and regulatory issues, problems, and frameworks affecting the management of cultural resources in North America and elsewhere in the world. Course coverage will include such topics as the laws affecting antiquities trafficking, and the relationships between indigenous peoples and archaeologists. Also offered for undergraduate-level credit as Anth 456.
Prerequisite: Graduate standing or instructor permission.

Anth 557 - Hunter-Gatherers (4)
An investigation of the economic and social diversity among modern and ancient hunter-gatherers and the theories and methods used by archaeologists to investigate and explain that diversity. Examines topics such as the evolution of hunting and gathering, hunter-gatherer settlement and mobility strategies, social complexity among hunter-gatherers and hunter-gatherers in the modern world. Also offered for undergraduate-level credit as Anth 457 and may be taken only once for credit.

Anth 558 - Past Human-Environment Interactions (4)
This course introduces students to major theoretical approaches and topics within the archaeological study of past human-environment interactions, including application of archaeological research to contemporary human-environment issues. Also offered for undergraduate-level credit as Anth 458 and may be taken only once for credit.
Prerequisite: Graduate standing or instructor permission.

Anth 561 - Advanced Topics in Archaeology (4)
In-depth exploration and analysis of a major current problem in archaeology. Problems may be substantive or theoretical. Also offered for undergraduate-level credit as Anth 461.
Prerequisite: Graduate standing or instructor permission.

Anth 564 - Topics in Northwest Archaeology (4)
An investigation of the economic and social diversity among modern and ancient hunter-gatherers and the theories and methods used by archaeologists to investigate and explain that diversity. Examines topics such as the evolution of hunting and gathering, hunter-gatherer settlement and mobility strategies, social complexity among hunter-gatherers and hunter-gatherers in the modern world. Also offered for undergraduate-level credit as Anth 457 and may be taken only once for credit.

Anth 570 - Core Seminar in Physical Anthropology (4)
A seminar that provides a methodological, theoretical, and substantive review and integration of anthropological materials in physical anthropology.
Prerequisite: graduate standing in anthropology and consent of instructor.

Anth 571 - Advanced Topics in Paleoanthropology (4)
In-depth exploration and analysis of current problems in the study of Northwest Prehistory, particularly as it articulates with general theories of hunter-gatherer adaptations and cultural evolution. Also offered for undergraduate-level credit as Anth 464.
Expected preparation: Anth 364.
Prerequisite: Graduate standing or instructor permission.

Anth 577 - Core Seminar in Physical Anthropology (4)
A seminar that provides a methodological, theoretical, and substantive review and integration of anthropological materials in physical anthropology.
Prerequisite: graduate standing in anthropology and consent of instructor.

Anth 578 - Advanced Topics in Paleanthropology (4)
In-depth exploration and analysis of current problems in the study of Paleoanthropology. Emphasis on articulation of evolutionary theory with fossils and other relevant evidence. Also offered for undergraduate-
level credit as Anth 471. Expected preparation: Anth 370.

Anth 572 - Population Dynamics (4)
The study of the principles of Mendelian and population genetics as they apply to the evolution of human populations and the maintenance of diversity in modern populations. Emphasis also is placed on the articulation of genetic methods with evolutionary theory. Also offered for undergraduate-level credit as Anth 472 and may be taken only once for credit. Expected preparation: Anth 372; 2 years of high school algebra or equivalent; Bi 341 as a pre- or corequisite.

Anth 577 - Primatology Field Methods (4)
Focus on methods for collecting behavioral and ecological data on free-ranging primates through a combination of field exercises and lectures. Curriculum includes development of ethograms, sampling methods and recording rules, mapping, and estimating resource availability. Students learn methods within a natural reserve setting populated by living primates. Also offered for undergraduate-level credit as Anth 477 and may be taken only once for credit.

Prerequisite: Anth 101 or permission of instructor.

Anth 578 - Human Osteology (4)
The identification and interpretation of human skeletal material from archaeological sites: the determination of age, gender, and population affinity; an introduction to paleopathology and the recognition of genetic and cultural variation. Also offered for undergraduate-level credit as Anth 478 and may be taken only once for credit.


Anth 579 - Forensic Anthropology (2)
Advanced techniques of human skeletal identification and their application to the solution of medico-legal (forensic) problems. Also offered for undergraduate-level credit as Anth 479 and may be taken only once for credit. Expected preparation: Anth 478/578 or consent of instructor.

Anth 590 - The Anthropology of Violence (4)
Theoretical and ethnographic exploration of the nature of violence. Topics include identity politics and nationalism; the biology of aggression and the cultural meanings of pain; state violence; symbolic and structural violence; and human rights. Also offered for undergraduate-level credit as Anth 490 and may be taken only once for credit. Expected preparation: 8 credits in socio-cultural anthropology (Anth 304, Anth 305 strongly recommended).

Ar - Arabic

Ar 101 - First-year Standard Arabic (4)
Introduction to modern literary (fus-ha) Arabic: Emphasis on reading and writing the cursive Arabic script, accurate pronunciation, comprehension of basic texts, translation, vocabulary, dictation, basic grammar and syntax, writing Arabic compositions, and media to facilitate the learning of simple communications in standard spoken Arabic. This is the first course in a sequence of three: Ar 101, Ar 102, and Ar 103. For non-native speakers of Arabic only.

Ar 102 - First-year Standard Arabic (4)
Introduction to modern literary (fus-ha) Arabic: Emphasis on reading and writing the cursive Arabic script, accurate pronunciation, comprehension of basic texts, translation, vocabulary, dictation, basic grammar and syntax, writing Arabic compositions, and media to facilitate the learning of simple communications in standard spoken Arabic. This is the second course in a sequence of three: Ar 101, Ar 102, and Ar 103. For non-native speakers of Arabic only.

Ar 103 - First-year Standard Arabic (4)
Introduction to modern literary (fus-ha) Arabic: Emphasis on reading and writing the cursive Arabic script, accurate pronunciation, comprehension of basic texts, translation, vocabulary, dictation, basic grammar and syntax, writing Arabic compositions, and media to facilitate the learning of simple communications in standard spoken Arabic. This is the third course in a sequence of three: Ar 101, Ar 102, and Ar 103. For non-native speakers of Arabic only.

Ar 199 - Special Studies (1-4)
(Credit to be arranged.)

Ar 201 - Second-year Standard Arabic (4)
Continued work in modern literary Arabic: Emphasis on reading prose texts dealing with the popular standard language, expanded grammar and syntax, writing Arabic compositions, translation, enhanced vocabulary, dictation, and media for better listening comprehension of standard spoken Arabic, for expanded conversations dealing with daily life. This is the first course in a sequence of three: Ar 201, Ar 202, and Ar 203.

Prerequisite: Ar 103. For non-native speakers of Arabic only.

Ar 202 - Second-year Standard Arabic (4)
Continued work in modern literary Arabic: Emphasis on reading prose texts dealing with the popular standard language, expanded grammar and syntax, writing Arabic compositions, translation, enhanced vocabulary, dictation, and media for better listening comprehension of standard spoken Arabic, for expanded conversations dealing with daily life. This is the second course in a sequence of three: Ar 201, Ar 202, and Ar 203.

Prerequisite: Ar 103. For non-native speakers of Arabic only.

Ar 203 - Second-year Standard Arabic (4)
Continued work in modern literary Arabic: Emphasis on reading prose texts dealing with the popular standard language, expanded grammar and syntax, writing Arabic compositions, translation, enhanced vocabulary, dictation, and media for better listening comprehension of standard spoken Arabic, for expanded conversations dealing with daily life. This is the third course in a sequence of three: Ar 201, Ar 202, and Ar 203.

Prerequisite: Ar 103. For non-native speakers of Arabic only.

Ar 204 - Common Spoken Arabic for Beginners (4)
Popular spoken Arabic ('ammiiyyah/darijah) used in social gathering and general daily life encounters. Does not replace Ar 201-2-3. For non-natives speakers of Arabic only. This is the first course in a sequence of three: Ar 204, Ar 205, and Ar 206.

Prerequisite: Ar 103.

Ar 205 - Common Spoken Arabic for Beginners (4)
Popular spoken Arabic ('ammiiyyah/darijah) used in social gathering and general daily life encounters. Does not replace Ar 201-2-3. For non-natives speakers of Arabic only. This is
Ar 206 - Common Spoken Arabic for Beginners (4)

Popular spoken Arabic (‘ammīyah/darjīyah) used in social gathering and general daily life encounters. Does not replace Ar 201-2-3. For non-natives speakers of Arabic only. This is the third course in a sequence of three: Ar 204, Ar 205, and Ar 206.

Prerequisite: Ar 103.

Ar 299 - Special Studies (1-12)

(Credit to be arranged.)

Ar 301 - Third-year Standard Arabic (4)

Intermediate modern literary Arabic prose: Emphasis on reading prose texts dealing with a wide spectrum of daily-life topics in their social-cultural context; advanced grammar and syntax (weak verbs, weak nouns, doubled verbs, verb moods, and the conditional); translation of complex texts, writing expanded Arabic compositions; media and Arabic web-sites to enhance conversational skills. This is the first course in a sequence of three: Ar 301, Ar 302, and Ar 303.

Ar 302 - Third-year Standard Arabic (4)

Intermediate modern literary Arabic prose: Emphasis on reading prose texts dealing with a wide spectrum of daily-life topics in their social-cultural context; advanced grammar and syntax (weak verbs, weak nouns, doubled verbs, verb moods, and the conditional); translation of complex texts, writing expanded Arabic compositions; media and Arabic web-sites to enhance conversational skills. This is the second course in a sequence of three: Ar 301, Ar 302, and Ar 303.

Ar 303 - Third-year Standard Arabic (4)

Intermediate modern literary Arabic prose: Emphasis on reading prose texts dealing with a wide spectrum of daily-life topics in their social-cultural context; advanced grammar and syntax (weak verbs, weak nouns, doubled verbs, verb moods, and the conditional); translation of complex texts, writing expanded Arabic compositions; media and Arabic web-sites to enhance conversational skills. This is the third course in a sequence of three: Ar 301, Ar 302, and Ar 303.

Ar 304 - Intermediate Common Spoken Arabic (4)

Practical pan-Arab spoken Arabic used in social, intellectual gatherings and business in lieu of limited local spoken "dialects," or the fus-ha (literary Arabic), understandable and usable anywhere in the Arab world. For non-native speakers of Arabic only. This is the first course in a sequence of three: Ar 304, Ar 305, and Ar 306.

Prerequisite: Ar 203 and Ar 206.

Ar 305 - Intermediate Common Spoken Arabic (4)

Practical pan-Arab spoken Arabic used in social, intellectual gatherings and business in lieu of limited local spoken "dialects," or the fus-ha (literary Arabic), understandable and usable anywhere in the Arab world. For non-native speakers of Arabic only. Does not replace Ar 301, 302, 303. This is the second course in a sequence of three: Ar 304, Ar 305, and Ar 306.

Prerequisite: Ar 203 and Ar 206.

Ar 306 - Intermediate Common Spoken Arabic (4)

Practical pan-Arab spoken Arabic used in social, intellectual gatherings and business in lieu of limited local spoken "dialects," or the fus-ha (literary Arabic), understandable and usable anywhere in the Arab world. For non-native speakers of Arabic only. Does not replace Ar 301, 302, 303. This is the third course in a sequence of three: Ar 304, Ar 305, and Ar 306.

Prerequisite: Ar 203 and Ar 206.

Ar 311 - Intermediate Media Arabic (4)

Reading and translating intermediate-level Arabic newspaper and journal materials; viewing selected media and news websites. For non-native speakers of Arabic only. Does not replace Ar 301, Ar 302, Ar 303.

Prerequisite: Ar 301, Ar 302, Ar 303.

Ar 330 - Arabic Calligraphy: Reading and Writing (4)

Introduction to Arabic script since the fifth century A.D.; presentation of early prominent pens and styles; reading various exhibits covering all major styles; mastering the writing of the ruq‘ah style. Does not replace Ar 301, 302, 303.

Prerequisite: Ar 203 or consent of instructor.

Ar 331 - Arabic Calligraphy: Reading and Writing (4)

Introduction to Arabic script since the fifth century A.D.; presentation of early prominent pens and styles; reading various exhibits covering all major styles; mastering the writing of the ruq‘ah style. Does not replace Ar 301, 302, 303.

Prerequisite: Ar 203 or consent of instructor.

Ar 399 - Special Studies (1-6)

(Credit to be arranged.)

Ar 401 - Research (1-6)

(Credit to be arranged.)

Ar 404 - Cooperative Education/Internship (1-12)

(Credit to be arranged.)

Ar 405 - Reading and Conference (1-12)

(Credit to be arranged.)

Ar 409 - Practicum (1-6)

(Credit to be arranged.)

Ar 410 - Selected Topics (1-6)

(Credit to be arranged.)

Ar 411 - Advanced Arabic (4)

Reading, discussing and translating advanced Arabic texts by prominent Arab authors in various genres presenting cultural, literary, and political topics. Also offered for graduate-level credit as Ar 511 and may be taken only once for credit.

Prerequisite: Ar 303 or consent of instructor.

Ar 412 - Advanced Arabic Reading and Writing: Essay (4)

Reading and translating advanced Arabic essays written by prominent Arab authors in various genres presenting social cultural topics, and writing critiques in Arabic. Also offered for graduate-level credit as Ar 512 and may be taken only once for credit.

Prerequisite: Ar 303 or consent of instructor.

Ar 413 - Advanced Modern Standard Arabic: Short Story and Novel (4)

Reading modern Arabic short stories, condensed novels, or short biographies of prominent Arab authors; viewing related films; writing critiques in Arabic. Also offered...
Ar 411 or Ar 519 may be taken only once for credit.

Prerequisite: Ar 301 and Ar 304 or consent of instructor.

Ar 419 - Folk Proverbs of the Arabs (4)

Reading and analyzing Arabic folk proverbs representing a wide range of critical social-cultural issues and moral values; writing critiques. Also offered for graduate-level credit as Ar 519 and may be taken only once for credit.

Prerequisite: Ar 301 and Ar 304 or consent of instructor.

Ar 420 - Folk Tales of the Arabs (4)

Introduction to the oral tradition of the Arabs since early times; analysis of selected folk tales; viewing cultural videos; writing short critiques. Also offered for graduate-level credit as Ar 520 and may be taken only once for credit.

Prerequisite: Ar 303 and Ar 304 or consent of instructor.

Ar 421 - Extemporized-sung Poetry and Folk Songs of the Arabs (4)

Reading, translating, and analyzing selected texts of extemporized-sung folk poetry (zajal) covering major genres and lyrics of folk songs composed in the vernacular Arabic; viewing videos of social occasions during which the above genres are performed; writing critical analysis of poems. Also offered for graduate-level credit as Ar 521 and may be taken only once for credit.

Prerequisite: Ar 303 and Ar 306 or consent of instructor.

Ar 423 - Modern Arabic Poetry (4)

Reading, translating, and analyzing selected modern Arabic poems from prominent Arab poets covering a wide range of issue and genres; writing critical analysis of poems. Also offered for graduate-level credit as Ar 523 and may be taken only once for credit.

Prerequisite: Ar 303 or consent of instructor.

Ar 424 - Classical Arabic Poetry (4)

Reading, translating, and analyzing selected texts of classical Arabic poems from prominent Arab poets of early Arabia and al-Andalus covering a wide range of major issues; writing critical analysis of poems. Also offered for graduate-level credit as Ar 524 and may be taken only once for credit.

Prerequisite: Ar 303 or consent of instructor.

Ar 427 - Advanced Classical Arabic: Prose (4)

Introduction to the history of Arabic prose (7th – 18th century AD); reading selected texts from classic literary works of major authors such as Ibn al-Muqaffa’, al-Jahiz, al-Isfahani, Ibn ‘Adiy, and Ibn ‘Abd Rabbuh; translating texts and writing literary reviews in Arabic. Also offered for graduate-level credit as Ar 527 and may be taken only once for credit.

Prerequisite: Ar 411 or Ar 511 or consent of instructor.

Ar 441 - Major Arabic Works in Translation (4)

Study of selected masterpieces of Arabic literature in English translation: short stories, women’s essays, poetry, folk literature, and introduction to Arab culture. Viewing critical films and videos. Lectures and discussions in English.

Ar 441U - Major Arabic Works in Translation (4)

Study of selected masterpieces of Arabic literature in English translation: short stories, women’s essays, poetry, folk literature, and introduction to Arab culture. Viewing critical films and videos. Lectures and discussions in English. Recommended prerequisite: 4 credits of upper division literature. Course may be repeated for credit if content varies.

Ar 490 - History of the Arabic Language (4)

Study of the development of classical Arabic language from early times, with emphasis on two major schools of Arabic grammar: al-Kufah and al-Basrah; contribution of major grammarians, evolution of morphology and syntax; development of current Modern Standard Arabic vs colloquial Spoken Arabic. Also offered for graduate-level credit as Ar 590 and may be taken only once for credit.

Prerequisite: Ar 303 or consent of instructor.

Ar 510 - Selected Topics (1-6)

(Credit to be arranged.)

Ar 511 - Advanced Arabic (4)

Reading, discussing and translating advanced Arabic texts by prominent Arab authors in various genres presenting cultural, literary, and political topics. Also offered for undergraduate-level credit as Ar 411 and may be taken only once for credit.

Ar 513 - Advanced Modern Standard Arabic: Short Story and Novel (4)

Reading modern Arabic short stories, condensed novels, or short biographies of prominent Arab authors; viewing related films; writing critiques in Arabic. Also offered for undergraduate-level credit as Ar 413 and may be taken only once for credit.

Ar 514 - Advanced Arabic Grammar (4)

The use of the critical connectors of the standard Arabic grammar and the major rules of the Arabic syntax. Also offered for undergraduate-level credit as Ar 414 and may be taken only once for credit.

Ar 519 - Folk Proverbs of the Arabs (4)

Reading and analyzing Arabic folk proverbs representing a wide range of critical social-cultural issues and moral values; writing critiques. Also offered for undergraduate-level credit as Ar 419 and may be taken only once for credit.

Prerequisite: Ar 411 or Ar 511 or consent of instructor.

Ar 520 - Folk Tales of the Arabs (4)

Introduction to the oral tradition of the Arabs since early times; analysis of selected folk tales; viewing cultural videos; writing short critiques. Also offered for undergraduate-level credit as Ar 420 and may be taken only once for credit.

Prerequisite: Ar 301 and Ar 304 or consent of instructor.

Ar 521 - Extemporized-sung Poetry and Folk Songs of the Arabs (4)

Reading, translating, and analyzing selected texts of extemporized-sung folk poetry (zajal) covering major genres and lyrics of folk songs composed in the vernacular Arabic; viewing videos of social occasions during which the above genres are performed; writing critical analysis of poems. Also offered for graduate-level credit as Ar 521 and may be taken only once for credit.

Prerequisite: Ar 303 and Ar 306 or consent of instructor.
also offered for undergraduate-level credit as Ar 421 and may be taken only once for credit.

Ar 523 - Modern Arabic Poetry (4)
Reading, translating, and analyzing selected modern Arabic poems from prominent Arab poets covering a wide range of issue and genres; writing critical analysis of poems. Also offered for undergraduate-level credit as Ar 423 and may be taken only once for credit.

Ar 524 - Classical Arabic Poetry (4)
Reading, translating, and analyzing selected texts of classical Arabic poems from prominent Arab poets of early Arabia and al-Andalus covering a wide range of major issues; writing critical analysis of poems. Also offered for undergraduate-level credit as Ar 424 and may be taken only once for credit.

Ar 527 - Advanced Classical Arabic: Prose (4)
Introduction to the history of Arabic prose (7th – 18th century AD); reading selected texts from classic literary works of major authors such as Ibn al-Muqaffa’, al-Jahiz, al-Isfahani, Ibn ‘Adiy, and Ibn ‘Abd Rabboh; translating texts and writing literary reviews in Arabic. Also offered for undergraduate-level credit as Ar 427 and may be taken only once for credit.

Ar 590 - History of the Arabic Language (4)
Study of the development of classical Arabic language from early times, with emphasis on two major schools of Arabic grammar: al-Kufah and al-Hasrah; contribution of major grammarians, evolution of morphology and syntax; development of current Modern Standard Arabic vs colloquial Spoken Arabic. Also offered for undergraduate-level credit as Ar 490 and may be taken only once for credit.

Arch - Architecture
Arch 100 - Introduction to Architecture (4)
Introductory course designed to introduce concepts, theories, and practices of the discipline of architecture. Includes a study of perceptual, environmental, technical, and organizational concepts through lectures and individual projects in observing architectural spaces and forms. Open to non-majors.

Arch 101 - Introduction to Environmental Design (4)
Concepts and theories of the fields of environmental and sustainable design. Includes a study of perceptual, technical, and philosophical concepts of natural and built resources through lectures, design projects, and individual projects. Open to non-majors.

Arch 120 - Visual Communication 1 (4)
An introduction to freehand drawing focused on the delineation of both interior and exterior space, starting with direct observation through to conceptual drawings of imagination. Use of different media and color including the study of light and light qualities. Open to non-majors.

Arch 121 - Visual Communication 2 (4)
Develops skills in graphic visualization, representation, and communication as used in architecture and related design fields. Concepts and conventions, from hand to digital media and production, used as a means to imagine, develop and represent design ideas.

Arch 199 - Special Studies (0-12)
See department for course description.

Arch 202 - Project Management II (6)
Series of courses designed to develop in students construction project management techniques for profitable construction administration. Students will demonstrate knowledge of course material by completing projects in light construction administration. Coursework includes utilization of estimating, critical path, and presentation computer software relevant to current practices. Arch 202: developing standards of performance, bidding contracts and liability, production scheduling, and techniques for controlling a profitable construction project. This is the second course in a sequence of two: Arch 201 and Arch 202 which must be taken in sequence.

Arch 225 - Digital Graphics (4)
A beginning computer graphics course that has at its core the idea to probe, to experiment, and to investigate the computer’s 3D modeling capability as a tool for rigorous design investigations.

Arch 230 - Architecture and Cultural History I (4)
A series of courses tracing the history of architecture understood as a cultural product from the early Paleolithic Age up to the 20th century. The first course covers from the early Stone Age up to the Iron Age, the second course begins in the 1st century C.E. to cover up to the 19th century, and the third course addresses the 20th century. The courses will focus on a select number of architectural works that are representative of specific cultural beliefs, values, and ideologies in a global context as embodied in architectonic forms and experiences. This is the first course in a sequence of three: Arch 230, Arch 231, and Arch 232 which must be taken in sequence.

Arch 231 - Architecture and Cultural History II (4)
A series of courses tracing the history of architecture understood as a cultural product from the early Paleolithic Age up to the 20th century. The first course covers from the early Stone Age up to the Iron Age, the second course begins in the 1st century C.E. to cover up to the 19th century, and the third course addresses the 20th century. The courses will focus on a select number of architectural works that are representative of specific cultural beliefs, values, and ideologies in a global context as embodied in architectonic forms and experiences. This is the second course in a sequence of three: Arch 230, Arch 231, and Arch 232 which must be taken in sequence.

Arch 232 - Architecture and Cultural History III (4)
A series of courses tracing the history of architecture understood as a cultural product from the early Paleolithic Age up to the 20th century. The first course covers from the early Stone Age up to the Iron Age, the second course begins in the 1st century C.E. to cover up to the 19th century, and the third course addresses the 20th century. The courses will focus on a select number of...
architectural works that are representative of specific cultural beliefs, values, and ideologies in a global context as embodied in architectonic forms and experiences. This is the third course in a sequence of three: Arch 230, Arch 231, and Arch 232 which must be taken in sequence.

Arch 280 - Design Fundamentals Studio 1 (6)
Foundational design studio sequence initiating awareness of the creative language of architecture through practical assignments in drawing, modeling, and artful making. The communication of perceptions and imaginative propositions through the use of diverse media is encouraged. Includes individual criticism, lectures, and seminar discussions. This is the first course in a sequence of two: Arch 280 and Arch 281 which must be taken in sequence.
Prerequisite: Arch 100, Arch 101, Arch 121.

Arch 281 - Design Fundamentals Studio 2 (6)
Foundational design studio sequence initiating awareness of the creative language of architecture through practical assignments in drawing, modeling, and artful making. The communication of perceptions and imaginative propositions through the use of diverse media is encouraged. Includes individual criticism, lectures, and seminar discussions. This is the second course in a sequence of two: Arch 280 and Arch 281 which must be taken in sequence.
Prerequisite: Arch 100, Arch 101, Arch 121.

Arch 299 - Special Studies (1-6)
(Credit to be arranged.)

Arch 360 - Building Tectonics 1 (4)
A three-quarter sequence introducing technologies involved in the design and construction of buildings. Topics include construction materials and methods, envelope design, mechanical systems, thermal, and other environmental building systems. This is the first course in a sequence of three: Arch 360, Arch 361, and Arch 362 which must be taken in sequence.
Prerequisite: Arch 281.

Arch 361 - Building Tectonics 2 (4)
A three-quarter sequence introducing technologies involved in the design and construction of buildings. Topics include construction materials and methods, envelope design, mechanical systems, thermal, and other environmental building systems. This is the third course in a sequence of three: Arch 360, Arch 361, and Arch 362 which must be taken in sequence.
Prerequisite: Arch 360.

Arch 362 - Building Tectonics 3 (4)
A three-quarter sequence introducing technologies involved in the design and construction of buildings. Topics include construction materials and methods, envelope design, mechanical systems, thermal, and other environmental building systems. This is the second course in a sequence of three: Arch 360, Arch 361, and Arch 362 which must be taken in sequence.
Prerequisite: Arch 360.

Arch 367 - Fundamentals of Environmental Design (4)
Basic concepts of climate and impacts on personal comfort. Thermal, lighting, and acoustical topics covered. Design approaches and concepts discussed from large urban siting projects to individual buildings in order to minimize mechanical systems and reduce energy use. Alternative energy sources and building materials introduced.
Prerequisite: junior year standing.

Arch 367U - Fundamentals of Environmental Design (4)
Basic concepts of climate and impacts on personal comfort. Thermal, lighting, and acoustical topics covered. Design approaches and concepts discussed from large urban siting projects to individual buildings in order to minimize mechanical systems and reduce energy use. Alternative energy sources and building materials introduced.
Prerequisite: Arch 380.

Arch 380 - Architectural Design Studio 1 (6)
Studio investigations of fundamental design concepts, issues, and process. Projects and exercises focusing on the concepts of making three-dimensional forms --organization, proportion, scale, human activities, and introductory site and building design relationships. The release of the student’s potential creative capabilities is a primary concern for the course. Includes individual criticism, lectures, and seminars. This is the first course in a sequence of three: Arch 380, Arch 381, and Arch 382 and must be taken in sequence.
Prerequisite: Arch 380.

Arch 381 - Architectural Design Studio 2 (6)
Studio investigations of fundamental design concepts, issues, and process. Projects and exercises focusing on the concepts of making three-dimensional forms --organization, proportion, scale, human activities, and introductory site and building design relationships. The release of the student’s potential creative capabilities is a primary concern for the course. Includes individual criticism, lectures, and seminars. This is the second course in a sequence of three: Arch 380, Arch 381, and Arch 382 and must be taken in sequence.
Prerequisite: Arch 380.

Arch 382 - Architectural Design Studio 3 (6)
Studio investigations of fundamental design concepts, issues, and process. Projects and exercises focusing on the concepts of making three-dimensional forms --organization, proportion, scale, human activities, and introductory site and building design relationships. The release of the student’s potential creative capabilities is a primary concern for the course. Includes individual criticism, lectures, and seminars. This is the third course in a sequence of three: Arch 380, Arch 381, and Arch 382 and must be taken in sequence.
Prerequisite: Arch 380.
Arch 399 - Special Studies (0-12)
See department for course description. (Credit to be arranged.)

Arch 401 - Research (0-12)
See department for course description. (Credit to be arranged.)

Arch 404 - Cooperative Education/Internship (0-12)
See department for course description. (Credit to be arranged.)

Arch 405 - Reading or Studio and Conference (0-12)
See department for course description. (Credit to be arranged.)

Arch 406 - Special Projects (1-12)
(Credit to be arranged.)

Arch 407 - Seminar (0-12)
See department for course description. (Credit to be arranged.)

Arch 408 - Workshop (0-12)
See department for course description. (Credit to be arranged.)

Arch 410 - Selected Topics (0-12)
See department for course description. (Credit to be arranged.)

Arch 410U - Selected Topics (1-4)
(Credit to be arranged.)

Arch 420 - Advanced Architectural Graphics and Media (4)
Studio assignments exploring a full range of graphic representational techniques and media. Exploratory drawing and modeling work addressing the visualization of ideas in architecture, including: speculative thought and concept formation; studies of light and shadow; exploration of color and texture of materials; and the composition of appropriate and coherent forms of visual presentation. Also offered for graduate-level credit as Arch 520 and may be taken only once for credit.

Arch 421 - Urban Design Methods (4)
Introduction to analytical and synthetic research methodologies inherent in the design of natural, architectural and urban contexts essential to contemporary urban design practice. Also offered as graduate-level credit as Arch 521 and may be taken only once for credit.

Arch 425 - Architectural Computer Graphics I (4)
Focuses on computer-aided design software as used in the architecture field (e.g., AutoCad). Arch 425 explores various methods for constructing, editing, and displaying two-dimensional architectural drawings. Arch 426 explores methods for creating, modifying, and visualizing three-dimensional architectural forms. This is the first course in a sequence of two: Arch 425 and Arch 426 which must be taken in sequence. Also offered as graduate-level credit as Arch 525 and may be taken only once for credit.

Prerequisite: Arch 281.

Arch 426 - Architectural Computer Graphics II (4)
Focuses on computer-aided design software as used in the architecture field (e.g., AutoCad). Arch 425 explores various methods for constructing, editing, and displaying two-dimensional architectural drawings. Arch 426 explores methods for creating, modifying, and visualizing three-dimensional architectural forms. This is the second course in a sequence of two: Arch 425 and Arch 426 and must be taken in sequence. Also offered as graduate-level credit as Arch 526 and may be taken only once for credit.

Prerequisite: Arch 425.

Arch 429 - Architectural Computer Graphics III (4)
Focuses on computer-aided design software as used in the architecture field (e.g., AutoCad). Arch 425 explores various methods for constructing, editing, and displaying two-dimensional architectural drawings. Arch 426 explores methods for creating, modifying, and visualizing three-dimensional architectural forms. This is the second course in a sequence of two: Arch 425 and Arch 426 and must be taken in sequence. Also offered as graduate-level credit as Arch 526 and may be taken only once for credit.

Prerequisite: Arch 425.

Arch 430 - Architectural Theory (4)
Introduction to the content of theoretical propositions in architecture and their influence upon the directions, emphases and outcomes of creative making within an historical context.

Arch 431 - Studies in Contemporary Urban Design (4)
Seminar course examining the contemporary relationships between the making of architecture and the making of cities. The course critically explores emerging urban characteristics, comparative design strategies, and the integration of design approaches with the processes of economic and social change. Also offered for graduate-level credit as Arch 531 and may be taken only once for credit.

Prerequisite: upper-division standing.

Arch 432 - History and Theory of Urban Design (3)
Introduction to the development of historical and contemporary urban design with parallel developments in architecture and urban planning. Theoretical models are related to current practices in the design of various sociopolitical, environmental and aesthetic urban contexts. Also offered for graduate-level credit as Arch 532 and may be taken only once for credit.

Arch 433 - Contemporary Issues Seminar (4)
In-depth exploration of selected topics that explore contemporary issues informing the discipline of architecture. Whether cultural, social, political, economic, aesthetic, environmental or other, contemporary issues and voices contribute to the dynamic and evolving production, construction and inhabitation of architecture. Topics may include: visual art, literature, aesthetics, ethics, philosophy, politics, culture(s), and technology. Course may be repeated for credit with different topics. Also offered for graduate-level credit as Arch 533.

Prerequisite: upper-division standing or graduate standing.

Arch 434 - Topics in Architectural History and Theory (4)
Seminar on selected topics focusing on the history and theory of architecture. Consists of discussions, presentations, lectures, and readings on relevant topics as they have historically emerged within the discipline of architecture. May focus on specific historical periods and/or may include philosophy of architecture, architectural representation, architecture and the city. Course may be repeated for credit with different topics. Also offered for graduate-level credit as Arch 534.

Prerequisite: upper division or graduate standing.

Arch 435 - Topics in Modernism (4)
Seminar investigating the influences and products of industrialized cultures as they relate to the discipline of architecture. Depending on the instructor, emphasis may be on the critical study of cities, buildings, or landscapes, but each will be explored within the comprehensive understanding of the cultural and social conditions of Modernism.
Course may be repeated for credit with different topics. Also offered for graduate-level credit as Arch 535.

Prerequisite: upper division or graduate standing.

**Arch 440 - Professional Practice (4)**

A lecture course focusing on the context, responsibilities, licensure, principles and processes of the practice of architecture, including project and client acquisition, risk analysis, project and practice management, project delivery methods, services and scope definition, roles and responsibilities of all parties, contract forms, general conditions of the contract, compensation methods, fee budget management, contract administration, and standard of care. Also offered for graduate-level credit as Arch 540 and may be taken only once for credit.

Prerequisite: upper division standing.

**Arch 441 - Practicum and Internship (4)**

Offers students an opportunity to gain industry experience and to integrate the skills and concepts learned in the academic curriculum. Weekly seminars review and establish internship objectives, which closely parallel the architectural internship development program required for licensure. Students are expected to secure employment or positions that meet the objectives of the course. Also offered for graduate-level credit as Arch 541 and may be taken only once for credit.

Prerequisite: Upper-division standing.

**Arch 442 - Building Economics (4)**

Focuses on the economic and life cycle context of building design and management decisions. Topics include project life cycle, decision milestones, value analysis of design and project proforma, discounted cash flow and equivalency calculation methods, and conceptual estimating techniques for building projects. Strategic leveraging of project value is emphasized, and sustainability objectives are examined. Also offered for graduate-level credit as Arch 542 and may be taken only once for credit.

Prerequisite: Arch 440 or Arch 540.

**Arch 460 - Concepts in Building Technology (4)**

Exploration of current advanced building technology and form generative responses to current sustainability issues. Includes extensive investigation of current technologies for envelope, mechanical and thermal comfort systems, and lighting and day-lighting strategies. Strategies of formal integration with architectural design area emphasized.

Prerequisite: Arch 362.

**Arch 462 - Advanced Architectural Materials (4)**

Seminar building on basic properties of architectural materials learned in Arch 360. A research-based course looking at creative use and reuse of materials for construction emphasizing sustainable solutions. Includes case study investigations of contemporary innovative material usage and student-designed building component. Also offered for graduate-level credit as Arch 562 and may be taken only once for credit.

Prerequisite: Arch 362 or graduate standing.

**Arch 467 - Building Structures (4)**

A lecture course that develops a basic understanding of structural elements and their implications for architectural form. Major topics include assembly, statics, properties of common structural materials, vertical and lateral load resisting systems. Precedent studies investigate structure in historical and contemporary buildings.

Prerequisite: Arch 362.

**Arch 480 - Architectural Design Studio 4 (6)**

Studio investigations of architectural designs based on supporting human activities, structure, and theory. Continued study of design process and methods encompassing concepts of architecture, landscape architecture, and interior design. Includes individual criticism, lectures, and seminars. This is the first course in a sequence of three: Arch 480, Arch 481, and Arch 482 which must be taken in sequence.

Prerequisite: Arch 381 or Arch 382 and Arch 362.

**Arch 481 - Architectural Design Studio 5 (6)**

Studio investigations of architectural designs based on supporting human activities, structure, and theory. Continued study of design process and methods encompassing concepts of architecture, landscape architecture, and interior design. Includes individual criticism, lectures, and seminars.

Prerequisite: Arch 582.
Arch 520 - Advanced Architectural Graphics and Media (4)

Studio assignments exploring a full range of graphic representational techniques and media. Explanatory drawing and modeling work addressing the visualization of ideas in architecture, including: speculative thought and concept formation; studies of light and shadow; exploration of color and texture of materials; and the composition of appropriate and coherent forms of visual presentation. Also offered for undergraduate-level credit as Arch 420 and may be taken only once for credit.

Arch 521 - Urban Design Methods (4)

Introduction to analytical and synthetic research methodologies inherent in the design of natural, architectural and urban contexts essential to contemporary urban design practice. Also offered as undergraduate-level credit as Arch 421 and may be taken only once for credit.

Arch 525 - Architectural Computer Graphics I (4)

Focuses on computer-aided design software as used in the architecture field (e.g., AutoCad). Arch 425 explores various methods for constructing, editing, and displaying two-dimensional architectural drawings. Arch 426 explores methods for creating, modifying, and visualizing three-dimensional architectural forms. This is the first course in a sequence of two: Arch 525 and Arch 526 and must be taken in sequence. Also offered as undergraduate-level credit as Arch 425 and may be taken only once for credit.

Arch 526 - Architectural Computer Graphics II (4)

Focuses on computer-aided design software as used in the architecture field (e.g., AutoCad). Arch 425 explores various methods for constructing, editing, and displaying two-dimensional architectural drawings. Arch 426 explores methods for creating, modifying, and visualizing three-dimensional architectural forms. This is the second course in a sequence of two: Arch 525 and Arch 426 and must be taken in sequence. Also offered as undergraduate-level credit as Arch 426 and may be taken only once for credit.

Arch 530 - Contemporary Architectural Theory (4)

Seminar course investigating architectural theory and critical thought by examination of key texts and contemporary architectural works.

Arch 531 - Studies in Contemporary Urban Design (4)

Seminar course examining the contemporary relationships between the making of architecture and the making of cities. The course critically explores emerging urban characteristics, comparative design strategies, and the integration of design approaches with the processes of economic and social change. Also offered for undergraduate-level credit as Arch 431 and may be taken only once for credit.

Prerequisite: upper-division standing.

Arch 532 - History and Theory of Urban Design (3)

Introduction to the development of historical and contemporary urban design with parallel developments in architecture and urban planning. Theoretical models are related to current practices in the design of various sociopolitical, environmental and aesthetic urban contexts. Also offered for undergraduate-level credit as Arch 432 and may be taken only once for credit.

Arch 533 - Contemporary Issues Seminar (4)

In-depth exploration of selected topics that explore contemporary issues informing the discipline of architecture. Whether cultural, social, political, economic, aesthetic, environmental or other, contemporary issues and voices contribute to the dynamic and evolving production, construction and inhabitation of architecture. Topics may include: visual art, literature, aesthetics, ethics, philosophy, politics, culture(s), and technology. Course may be repeated for credit with different topics. Also offered for undergraduate-level credit as Arch 433.

Arch 534 - Topics in Architectural History and Theory (4)

Seminar on selected topics focusing on the history and theory of architecture. Consists of discussions, presentations, lectures, and readings on relevant topics as they have historically emerged within the discipline of architecture. May focus on specific historical periods and/or may include philosophy of architecture, architectural representation, architecture and the city. Course may be repeated for credit with different topics. Also offered for undergraduate-level credit as Arch 434.

Prerequisite: upper division or graduate standing.

Arch 535 - Topics in Modernism (4)

Seminar investigating the influences and products of industrialized cultures as they relate to the discipline of architecture. Depending on the instructor, emphasis may be on the critical study of cities, buildings, or landscapes, but each will be explored within the comprehensive understanding of the cultural and social conditions of Modernism. Course may be repeated for credit with different topics. Also offered for undergraduate-level credit as Arch 435.

Prerequisite: upper division or graduate standing.

Arch 540 - Professional Practice (4)

A lecture course focusing on the context, responsibilities, licensure, principles and processes of the practice of architecture, including project and client acquisition, risk analysis, project and practice management, project delivery methods, services and scope definition, roles and responsibilities of all parties, contract forms, general conditions of the contract, compensation methods, fee budget management, contract administration, and standard of care. Also offered for undergraduate-level credit Arch 440 and may be taken only once for credit.

Prerequisite: upper division standing.

Arch 541 - Practicum and Internship (4)

Offers students an opportunity to gain industry experience and to integrate the skills and concepts learned in the academic curriculum. Weekly seminars review and establish internship objectives, which closely parallel the architectural internship development program required for licensure. Students are expected to secure employment or positions that meet the objectives of the course. Also offered for undergraduate-level credit as Arch 441 and may be taken only once for credit.

Arch 542 - Building Economics (4)

Focuses on the economic and life cycle context of building design and management.
decisions. Topics include project life cycle, decision milestones, value analysis of design and project proforma, discounted cash flow and equivalency calculation methods, and conceptual estimating techniques for building projects. Strategic leveraging of project value is emphasized, and sustainability objectives are examined. Also offered for undergraduate-level credit as Arch 442 and may be taken only once for credit.

Prerequisite: Arch 440 or Arch 540.

Arch 543 - Topics in Professional Practice (4)
Focused investigation of key aspects of professional architectural practice through direct case study analysis, reflection and critical appraisal. Emphasis on understanding the application of professionally inspired principles and processes in contemporary architectural practice.

Prerequisite: Arch 540.

Arch 560 - Advanced Architectural Technology (4)
A lecture and seminar course providing exploration of current advanced building technology and form generative responses to current sustainability issues. Includes extensive classroom, as well as fieldwork, and laboratory investigation of current technologies for envelope, mechanical and thermal comfort systems, and lighting and day-lighting strategies. Strategies of formal integration with architectural design are emphasized.

Arch 561 - Detail Design (4)
A companion course to the Design Thesis, developing the technological implications of the thesis proposition. Addresses the detailed application of technological know-how in terms of materials, envelope, environmental control, tectonics and structural logic, with respect to a predetermined portion of the architectural project.

Prerequisite: Arch 511.

Arch 562 - Advanced Architectural Materials (4)
Seminar building on basic properties of architectural materials learned in Arch 360. A research-based course looking at creative use and reuse of materials for construction emphasizing sustainable solutions. Includes case study investigations of contemporary innovative material usage and student-designed building component. Also offered for undergraduate-level credit as Arch 462 and may be taken only once for credit.

Prerequisite: Arch 362 or graduate standing.

Arch 563 - Building Science Research Topics (4)
A workshop and seminar addressing the detailed application of passive strategies and building technology engaging key topics such as: building materials, envelope, environmental control, and structural systems. Utilizing contemporary building science research methods and practice. Course may be repeated for credit with different topics.

Arch 567 - Advanced Architectural Structures (4)
A workshop and seminar based course addressing the design and construction of large-scale structural systems. Investigates the innovative use of traditional and non-traditional building materials and structural detailing, exploring the potential of visually expressive structural systems through a series of working models. Architectural precedent and nature’s engineering will be studied to gain insight into the correlation of form and structure.

Arch 568 - Architectural Technology I (4)
A two-quarter sequence introducing technologies involved in the design and construction of buildings. Exploration of the physical properties of materials, building assemblies, and the methods of construction, leading to the integration of building envelope, mechanical, thermal and other environmental building systems. This is the first course in a sequence of two: Arch 568 and Arch 569 which must be taken in sequence.

Prerequisite: graduate standing.

Arch 569 - Architectural Technology II (4)
A two-quarter sequence introducing technologies involved in the design and construction of buildings. Exploration of the physical properties of materials, building assemblies, and the methods of construction, leading to the integration of building envelope, mechanical, thermal and other environmental building systems. This is the second course in a sequence of two: Arch 568 and Arch 569 which must be taken in sequence.

Prerequisite: Arch 568.

Arch 570 - Architectural Design Transition Studio I (6)
Transition studios developing architectural ideas, alongside media and technical skills necessary for advanced graduate study. Creative investigations of architectural design inspired by human activities, site, landscape, structure, tectonics, communal space and urbanism. Includes individual criticism, lectures and seminars. This is the first course in a sequence of three: Arch 570, Arch 571, and Arch 572 which must be taken in sequence.

Prerequisite: graduate standing.

Arch 571 - Architectural Design Transition Studio II (6)
Transition studios developing architectural ideas, alongside media and technical skills necessary for advanced graduate study. Creative investigations of architectural design inspired by human activities, site, landscape, structure, tectonics, communal space and urbanism. Includes individual criticism, lectures and seminars. This is the second course in a sequence of three: Arch 570, Arch 571, and Arch 572 which must be taken in sequence.

Prerequisite: Arch 570.

Arch 572 - Architectural Design Transition Studio III (6)
Transition studios developing architectural ideas, alongside media and technical skills necessary for advanced graduate study. Creative investigations of architectural design inspired by human activities, site, landscape, structure, tectonics, communal space and urbanism. Includes individual criticism, lectures and seminars. This is the third course in a sequence of three: Arch 570, Arch 571, and Arch 572 which must be taken in sequence.

Prerequisite: Arch 571.

Arch 580 - Architectural Design Studio 7 (6)
Advanced investigations of architectural and urban design issues in concluding series of studies. Projects include the design of private and public buildings which require comprehensive, integrative design development. Includes individual criticism,
Arch 580 - Design Development Studio 8 (6)
Advanced investigations of architectural and urban design issues in concluding series of studios. Projects include the design of private and public buildings which require comprehensive, integrative design development. Includes individual criticism, lectures, and seminars. This is the second course in a sequence of three: Arch 580, Arch 581, and Arch 582 which must be taken in sequence.
Prerequisite: Arch 580.

Arch 581 - Architectural Design Studio 9 (6)
A companion course to Architectural Design Studio 9, this studio addresses the integration of building systems through detailed development of the design proposition begun in Arch 582 leading to a comprehensive design. Addresses application and technical documentation of building systems including materials, envelope, environmental controls, building services, and structure.
Prerequisite: Arch 582.

Arch 585 - Design Thesis (6)
A studio course offering a focused culmination of architectural design studies by means of a student generated thesis proposition incorporating research, development, and creative transformation of a specific urban situation.
Prerequisite: Arch 511, Arch 584.

Arch 586 - Integrated Systems (6)
A companion course to Architectural Design Studio 9, this studio addresses the integration of building systems through detailed development of the design proposition begun in Arch 582 leading to a comprehensive design. Addresses application and technical documentation of building systems including materials, envelope, environmental controls, building services, and structure.
Prerequisite: Arch 582.

ArH - Art History
ArH 110 - Visual Literacy (4)
Course is intended to equip students with the necessary skills to critically view and interpret global visual culture, and to provide them with a strong foundation for future art courses in art history, art, and design, through critical analysis, reading, discussion, and writing.

ArH 199 - Special Studies (0-12)
See department for course description. (Credit to be arranged.)

ArH 204 - History of Western Art (4)
Survey of the visual arts from prehistoric art to the present. Selected works of painting, sculpture, architecture, and other arts are studied in relation to the cultures that produced them. ArH 204: Prehistoric through Early Medieval. ArH 205: Romanesque through Rococo. ArH 206: Enlightenment through Contemporary Art. This is the first course in a sequence of three: ArH 204, ArH 205, and ArH 206. Open to non-majors.

ArH 206 - History of Western Art (4)
Survey of the visual arts from prehistoric art to the present. Selected works of painting, sculpture, architecture, and other arts are studied in relation to the cultures that produced them. ArH 204: Prehistoric through Early Medieval. ArH 205: Romanesque through Rococo. ArH 206: Enlightenment through Contemporary Art. This is the second course in a sequence of three: ArH 204, ArH 205, and ArH 206. Open to non-majors.

ArH 208 - Introduction to Asian Art (4)
Historical survey of the visual arts in Asia from prehistory to 1900. Selected works of painting, sculpture, architecture, and ceramics from India, China, Japan, Korea, Southeast and Central Asia are studied in relation to the religions and cultures producing them. Open to non-majors.

ArH 290 - History of Modern Design (4)
Survey of the visual arts from c. 1800 to the present, focusing on the changes in style within the field, but also on the interconnection between design and other forms of expression. Open to non-majors.

ArH 291 - History of Animation (4)
Exploration of the history of animation, its sources in drawing, painting, photography, film, video, and digital media, its various innovators, styles, and techniques, its relationship with cinema, and its reliance on the development of creative and presentation technologies. Emphasis is placed on the theory and critical study of animation. Readings and discussion are combined with extensive screenings of animations and animated films, including the history of computer animation. Open to non-majors.

ArH 311 - History of Asian Art (4)
A survey of art and architecture of Asia from prehistoric times to the 19th century. The art and architecture (including ceramics, sculpture, painting, textiles, and other utilitarian implements—e.g., ritual bronze vessels of China) of Asia will be presented in context of chronology, source (indigenous or foreign influence), site and in relation to the forces of each society’s culture, religion, politics, geography, and history.
Hinduism, Confucianism, Shintoism, Taoism, Shamanism, symbolism, and mythology are basic to the arts of Asia. ArH 311: South Asia (India) and Southeast Asia (Sri Lanka, Cambodia, Thailand, Burma, and Indonesia). ArH 312: China and Korea. ArH 313: Japan. This is the first course in a sequence of three: ArH 311, ArH 312, and ArH 313. Prerequisite: Upper-division standing. Open to non-majors.

**ArH 311U - History of Asian Art (4)**
A survey of art and architecture of Asia from prehistoric times to the 19th century. The art and architecture (including ceramics, sculpture, painting, textiles, and other utilitarian implements—e.g., ritual bronze vessels of China) of Asian art will be presented in context of chronology, source (indigenous or foreign influence), site and in relation to the forces of each society’s culture, religion, politics, geography, and history. Buddhism, Hinduism, Confucianism, Shintoism, Taoism, Shamanism, symbolism, and mythology are basic to the arts of Asia. ArH 311: South Asia (India) and Southeast Asia (Sri Lanka, Cambodia, Thailand, Burma, and Indonesia). ArH 312: China and Korea. ArH 313: Japan. This is the second course in a sequence of three: ArH 311, ArH 312, and ArH 313. Prerequisite: Upper-division standing. Open to non-majors.

**ArH 312 - History of Asian Art (4)**
A survey of art and architecture of Asia from prehistoric times to the 19th century. The art and architecture (including ceramics, sculpture, painting, textiles, and other utilitarian implements—e.g., ritual bronze vessels of China) of Asian art will be presented in context of chronology, source (indigenous or foreign influence), site and in relation to the forces of each society’s culture, religion, politics, geography, and history. Buddhism, Hinduism, Confucianism, Shintoism, Taoism, Shamanism, symbolism, and mythology are basic to the arts of Asia. ArH 311: South Asia (India) and Southeast Asia (Sri Lanka, Cambodia, Thailand, Burma, and Indonesia). ArH 312: China and Korea. ArH 313: Japan. This is the third course in a sequence of three: ArH 311, ArH 312, and ArH 313. Prerequisite: Upper-division standing. Open to non-majors.

**ArH 312U - History of Asian Art (4)**
A survey of art and architecture of Asia from prehistoric times to the 19th century. The art and architecture (including ceramics, sculpture, painting, textiles, and other utilitarian implements—e.g., ritual bronze vessels of China) of Asian art will be presented in context of chronology, source (indigenous or foreign influence), site and in relation to the forces of each society’s culture, religion, politics, geography, and history. Buddhism, Hinduism, Confucianism, Shintoism, Taoism, Shamanism, symbolism, and mythology are basic to the arts of Asia. ArH 311: South Asia (India) and Southeast Asia (Sri Lanka, Cambodia, Thailand, Burma, and Indonesia). ArH 312: China and Korea. ArH 313: Japan. This is the third course in a sequence of three: ArH 311, ArH 312, and ArH 313. Prerequisite: Upper-division standing. Open to non-majors.

**ArH 313 - History of Asian Art (4)**
A survey of art and architecture of Asia from prehistoric times to the 19th century. The art and architecture (including ceramics, sculpture, painting, textiles, and other utilitarian implements—e.g., ritual bronze vessels of China) of Asian art will be presented in context of chronology, source (indigenous or foreign influence), site and in relation to the forces of each society’s culture, religion, politics, geography, and history. Buddhism, Hinduism, Confucianism, Shintoism, Taoism, Shamanism, symbolism, and mythology are basic to the arts of Asia. ArH 311: South Asia (India) and Southeast Asia (Sri Lanka, Cambodia, Thailand, Burma, and Indonesia). ArH 312: China and Korea. ArH 313: Japan. This is the third course in a sequence of three: ArH 311, ArH 312, and ArH 313. Prerequisite: Upper-division standing. Open to non-majors.

**ArH 313U - History of Asian Art (4)**
A survey of art and architecture of Asia from prehistoric times to the 19th century. The art and architecture (including ceramics, sculpture, painting, textiles, and other utilitarian implements—e.g., ritual bronze vessels of China) of Asian art will be presented in context of chronology, source (indigenous or foreign influence), site and in relation to the forces of each society’s culture, religion, politics, geography, and history. Buddhism, Hinduism, Confucianism, Shintoism, Taoism, Shamanism, symbolism, and mythology are basic to the arts of Asia. ArH 311: South Asia (India) and Southeast Asia (Sri Lanka, Cambodia, Thailand, Burma, and Indonesia). ArH 312: China and Korea. ArH 313: Japan. This is the third course in a sequence of three: ArH 311, ArH 312, and ArH 313. Prerequisite: Upper-division standing. Open to non-majors.

**ArH 321 - Survey of Korean Art (4)**
A chronological survey of art and architecture of Korea, and its uniqueness, in the context of East Asian art history. Prehistoric arts, as well as tomb paintings, and artifacts recognizing Buddhism’s effect on Korea’s sculptural, painting, and architectural heritage. Also treats Confucianism shaping Korean ink painting, folk painting, and porcelains. Prerequisite: Upper-division standing. Open to non-majors.

**ArH 321U - Survey of Korean Art (4)**
A chronological survey of art and architecture of Korea, and its uniqueness, in the context of East Asian art history. Prehistoric arts, as well as tomb paintings, and artifacts recognizing Buddhism’s effect on Korea’s sculptural, painting, and architectural heritage. Also treats Confucianism shaping Korean ink painting, folk painting, and porcelains. Prerequisite: Upper-division standing. Open to non-majors.

**ArH 337 - Nature into Art (4)**
Focuses on a specific theme concerning the relationship of the nature and the environment with the visual arts. Specific themes may include topics such as environmental art, landscape painting and/or photography, landscape architecture, cartography and art, and the representation of animals. Recommended preparation: ArH 205 or ArH 206 (expected of art history majors). Prerequisite: upper-division. Open to non-majors.

**ArH 337U - Nature into Art (4)**
Focuses on a specific theme concerning the relationship of the nature and the environment with the visual arts. Specific themes may include topics such as environmental art, landscape painting
ArH 352 - Ancient Art (4)
Art and architecture of the ancient world from Neolithic through Roman times. ArH 351: Egyptian, Mesopotamian. ArH 352: Greek. ArH 353: Etruscan and Roman. This is the second course in a sequence of three: ArH 351, ArH 352, and ArH 353. Recommended preparation: ArH 204 (expected of art history majors).
Prerequisite: upper-division standing.

ArH 352U - Ancient Art (4)
Art and architecture of the ancient world from Neolithic through Roman times. ArH 351: Egyptian, Mesopotamian. ArH 352: Greek. ArH 353: Etruscan and Roman. This is the second course in a sequence of three: ArH 351, ArH 352, and ArH 353. Recommended preparation: ArH 204 (expected of art history majors).
Prerequisite: upper-division standing.

ArH 353 - Ancient Art (4)
Art and architecture of the ancient world from Neolithic through Roman times. ArH 351: Egyptian, Mesopotamian. ArH 352: Greek. ArH 353: Etruscan and Roman. This is the third course in a sequence of three: ArH 351, ArH 352, and ArH 353. Recommended preparation: ArH 204 (expected of art history majors).
Prerequisite: upper-division standing.

ArH 353U - Ancient Art (4)
Art and architecture of the ancient world from Neolithic through Roman times. ArH 351: Egyptian, Mesopotamian. ArH 352: Greek. ArH 353: Etruscan and Roman. This is the third course in a sequence of three: ArH 351, ArH 352, and ArH 353. Recommended preparation: ArH 204 (expected of art history majors).
Prerequisite: upper-division standing.

ArH 354 - History of Architecture (4)
A history of architecture from Prehistory to Post-Modernism. This is the first course in a sequence of two: ArH 339 and ArH 340. Recommended preparation: ArH 204 or ArH 205 (expected of art history majors).
Prerequisite: upper-division standing.

ArH 355 - History of Architecture (4)
A history of architecture from Prehistory to Post-Modernism. This is the first course in a sequence of two: ArH 339 and ArH 340. Recommended preparation: ArH 204 or ArH 205 (expected of art history majors).
Prerequisite: upper-division standing.

ArH 356 - Early Medieval Art (4)
Focuses on the art and architecture of Early Christian, Celtic, Carolingian, and early Islamic world. Recommended preparation: ArH 204 (expected of art history majors).
Prerequisite: upper-division standing.

ArH 356U - Early Medieval Art (4)
Focuses on the art and architecture of Early Christian, Celtic, Carolingian, and early Islamic world. Recommended preparation: ArH 204 (expected of art history majors).
Prerequisite: upper-division standing.

ArH 357 - Byzantine Art (4)
Focuses on the art and architecture of the Byzantine world from the founding to the fall of Constantinople (330-1453 A.D.) Recommended preparation: ArH 204 (expected of art history majors).
Prerequisite: upper-division standing.

ArH 357U - Byzantine Art (4)
Focuses on the art and architecture of the Byzantine world from the founding to the fall of Constantinople (330-1453 A.D.) Recommended preparation: ArH 204 (expected of art history majors).
Prerequisite: upper-division standing.

ArH 358 - Romanesque Art (4)
Focuses on the art and architecture of the Romanesque, Crusader, and medieval Islamic world. Recommended preparation: ArH 204 (expected of art history majors).
Prerequisite: upper-division standing.

ArH 358U - Romanesque Art (4)
Focuses on the art and architecture of the Romanesque, Crusader, and medieval Islamic world. Recommended preparation: ArH 204 (expected of art history majors).
Prerequisite: upper-division standing.

ArH 359 - Gothic Art (4)
Studies Gothic art and architecture across Europe from the 13th to the 16th centuries. Topics include the development of the cathedral, and the rise of the city, and artists such as Giotto and Duccio. Recommended preparation: ArH 205 (expected of art history majors).
Prerequisite: upper-division standing.

ArH 359U - Gothic Art (4)
Studies Gothic art and architecture across Europe from the 13th to the 16th centuries. Topics include the development of the cathedral, and the rise of the city, and artists such as Giotto and Duccio. Recommended preparation: ArH 205 (expected of art history majors).
Prerequisite: upper-division standing.
ArH 361 - Northern Renaissance Art (4)
Manuscript illumination, painting, and sculpture in the Netherlands, Germany, and France from the late 14th to the 16th century. Recommended preparation: ArH 205 (expected of art art history majors).
Prerequisite: upper-division standing.
ArH 361U - Northern Renaissance Art (4)
Manuscript illumination, painting, and sculpture in the Netherlands, Germany, and France from the late 14th to the 16th century. Recommended preparation: ArH 205 (expected of art art history majors).
Prerequisite: upper-division standing.

ArH 371 - Italian Renaissance Art (4)
Painting, sculpture, and architecture from the 13th to the 16th century in Italy. This is the first course in a sequence of three: ArH 371, ArH 372, and ArH 373. Recommended preparation: ArH 205 (expected of art art history majors).
Prerequisite: upper-division standing.

ArH 371U - Italian Renaissance Art (4)
Painting, sculpture, and architecture from the 13th to the 16th century in Italy. This is the first course in a sequence of three: ArH 371, ArH 372, and ArH 373. Recommended preparation: ArH 205 (expected of art art history majors).
Prerequisite: upper-division standing.

ArH 372 - Italian Renaissance Art (4)
Painting, sculpture, and architecture from the 13th to the 16th century in Italy. This is the second course in a sequence of three: ArH 371, ArH 372, and ArH 373. Recommended preparation: ArH 205 (expected of art art history majors).
Prerequisite: upper-division standing.

ArH 372U - Italian Renaissance Art (4)
Painting, sculpture, and architecture from the 13th to the 16th century in Italy. This is the second course in a sequence of three: ArH 371, ArH 372, and ArH 373. Recommended preparation: ArH 205 (expected of art art history majors).
Prerequisite: upper-division standing.

ArH 373 - Italian Renaissance Art (4)
Painting, sculpture, and architecture from the 13th to the 16th century in Italy. This is the third course in a sequence of three: ArH 371, ArH 372, and ArH 373. Recommended preparation: ArH 205 (expected of art art history majors).
Prerequisite: upper-division standing.

ArH 373U - Italian Renaissance Art (4)
Painting, sculpture, and architecture from the 13th to the 16th century in Italy. This is the third course in a sequence of three: ArH 371, ArH 372, and ArH 373. Recommended preparation: ArH 205 (expected of art art history majors).
Prerequisite: upper-division standing.

ArH 376 - Baroque Art (4)
A study of European art and architecture from the late 16th to the mid-18th century. 376: Italy; 377: The Netherlands; 378: Spain and the Americas. This is the first course in a sequence of three: ArH 376, ArH 377, and ArH 378. Open to non-majors. Recommended preparation: ArH 205 (expected of art art history majors).
Prerequisite: upper-division standing.

ArH 376U - Baroque Art (4)
A study of European art and architecture from the late 16th to the mid-18th century. 376: Italy; 377: The Netherlands; 378: Spain and the Americas. This is the first course in a sequence of three: ArH 376, ArH 377, and ArH 378. Open to non-majors. Recommended preparation: ArH 205 (expected of art art history majors).
Prerequisite: upper-division standing.

ArH 377 - Baroque Art (4)
A study of European art and architecture from the late 16th to the mid-18th century. 376: Italy; 377: The Netherlands; 378: Spain and the Americas. This is the second course in a sequence of three: ArH 376, ArH 377, and ArH 378. Recommended preparation: ArH 205 (expected of art art history majors).
Prerequisite: upper-division standing.

ArH 377U - Baroque Art (4)
A study of European art and architecture from the late 16th to the mid-18th century. 376: Italy; 377: The Netherlands; 378: Spain and the Americas. This is the second course in a sequence of three: ArH 376, ArH 377, and ArH 378. Open to non-majors. Recommended preparation: ArH 205 (expected of art art history majors).
Prerequisite: upper-division standing.

ArH 381 - 19th Century Art (4)
A survey of painting and sculpture in the 19th century. ArH 381: Neoclassicism, Romanticism, and Realism; ArH 382: Impressionism and Post-Impressionism. This is the first course in a sequence of two: ArH 381 and ArH 382. Open to majors. Recommended preparation: ArH 206 (expected of art art history majors).
Prerequisite: upper-division standing.

ArH 381U - 19th Century Art (4)
A survey of painting and sculpture in the 19th century. ArH 381: Neoclassicism, Romanticism, and Realism; ArH 382: Impressionism and Post-Impressionism. This is the first course in a sequence of two: ArH 381 and ArH 382. Open to majors. Recommended preparation: ArH 206 (expected of art art history majors).
Prerequisite: upper-division standing.

ArH 382 - 19th Century Art (4)
A survey of painting and sculpture in the 19th century. ArH 381: Neoclassicism,
ArH 382U - 19th Century Art (4)
A survey of painting and sculpture in the 19th century. ArH 381: Neoclassicism, Romanticism, and Realism; ArH 382: Impressionism and Post-Impressionism. This is the second course in a sequence of two: ArH 381 and ArH 382. Recommended preparation: ArH 206 (expected of art history majors).
Prerequisite: upper-division standing.
ArH 381 - 18th Century Art (4)
A concentrated study of the 18th century. Open to non-majors.
Prerequisite: upper-division standing.

ArH 380 - Survey of Art History (4)
A survey of prehistoric to modern art history. See department for course description. (Credit to be arranged.)
Prerequisite: upper-division standing.

ArH 382 - Art History Majors' Seminar (1)
See department for course description. (Credit to be arranged.)
Prerequisite: upper-division standing.

ArH 383 - Seminar in 20th-Century Art (1)
See department for course description. (Credit to be arranged.)
Prerequisite: upper-division standing.

ArH 384 - Seminar in Contemporary Art (1)
See department for course description. (Credit to be arranged.)
Prerequisite: upper-division standing.

ArH 385 - Seminar in Art Theory (1)
See department for course description. (Credit to be arranged.)
Prerequisite: upper-division standing.

ArH 407 - Seminar (0-12)
See department for course description. (Credit to be arranged.)
Prerequisite: upper-division standing.

ArH 410 - Selected Topics (0-12)
See department for course description. (Credit to be arranged.)
Prerequisite: upper-division standing.

ArH 410U - Selected Topics (1-4)
(Credit to be arranged.)
Prerequisite: upper-division standing.

ArH 411 - Chinese Buddhist Art (4)
A concentrated study of the Buddhist art of China and Central Asia. Buddhist art of caves of the Six-dynasties period (220-589 C.E.) to the Tang period will be covered in-depth. Basic concepts of Buddhism, such as Hinayana, Mahayana, and Tantric Buddhism; arts related to specific sects; and the iconography and stylistic changes will be covered. Open to non-majors.
Prerequisite: upper-division standing.

ArH 411U - Chinese Buddhist Art (4)
A concentrated study of the Buddhist art of China and Central Asia. Buddhist art of caves of the Six-dynasties period (220-589 C.E.) to the Tang period will be covered in-depth. Basic concepts of Buddhism, such as Hinayana, Mahayana, and Tantric Buddhism; arts related to specific sects; and the iconography and stylistic changes will be covered. Open to non-majors.
Prerequisite: upper-division standing.

ArH 412 - Japanese Buddhist Art (4)
A survey of the Japanese Buddhist art and architecture, including: sculpture, painting, Shingon Buddhist art, Zen garden and architecture, and ink paintings through selected examples from the 6th century to the 18th century. Open to non-majors.
Prerequisite: upper-division standing.

ArH 412U - Japanese Buddhist Art (4)
A survey of the Japanese Buddhist art and architecture, including: sculpture, painting, Shingon Buddhist art, Zen garden and architecture, and ink paintings through selected examples from the 6th century to the 18th century. Open to non-majors.
Prerequisite: upper-division standing.

ArH 413 - Japanese Buddhist Art (4)
A concentrated study of the Buddhist art of China and Central Asia. Buddhist art of caves of the Six-dynasties period (220-589 C.E.) to the Tang period will be covered in-depth. Basic concepts of Buddhism, such as Hinayana, Mahayana, and Tantric Buddhism; arts related to specific sects; and the iconography and stylistic changes will be covered. Open to non-majors.
Prerequisite: upper-division standing.

ArH 414 - Japanese Buddhist Art (4)
A concentrated study of the Buddhist art of China and Central Asia. Buddhist art of caves of the Six-dynasties period (220-589 C.E.) to the Tang period will be covered in-depth. Basic concepts of Buddhism, such as Hinayana, Mahayana, and Tantric Buddhism; arts related to specific sects; and the iconography and stylistic changes will be covered. Open to non-majors.
Prerequisite: upper-division standing.

ArH 415 - Issues in Asian Art (4)
Issues in Asian art may be keyed to museum exhibitions or deal with thematic topics or specific media. Examples include Buddhist or other religious art, tomb art, ceramics, special topics in Korean art, or the work of Asian-American artists. Open to non-majors.
Prerequisite: upper-division standing.

ArH 415U - Issues in Asian Art (4)
Issues in Asian art may be keyed to museum exhibitions or deal with thematic topics or specific media. Examples include Buddhist or other religious art, tomb art, ceramics, special topics in Korean art, or the work of Asian-American artists. Open to non-majors.
Prerequisite: upper-division standing.

ArH 416 - Japanese Buddhist Art (4)
A survey of the Japanese Buddhist art and architecture, including: sculpture, painting, Shingon Buddhist art, Zen garden and architecture, and ink paintings through selected examples from the 6th century to the 18th century. Open to non-majors.
Prerequisite: upper-division standing.

ArH 416U - Japanese Buddhist Art (4)
A survey of the Japanese Buddhist art and architecture, including: sculpture, painting, Shingon Buddhist art, Zen garden and architecture, and ink paintings through selected examples from the 6th century to the 18th century. Open to non-majors.
Prerequisite: upper-division standing.

ArH 417 - Japanese Buddhist Art (4)
A concentrated study of the Buddhist art of China and Central Asia. Buddhist art of caves of the Six-dynasties period (220-589 C.E.) to the Tang period will be covered in-depth. Basic concepts of Buddhism, such as Hinayana, Mahayana, and Tantric Buddhism; arts related to specific sects; and the iconography and stylistic changes will be covered. Open to non-majors.
Prerequisite: upper-division standing.

ArH 418 - Japanese Buddhist Art (4)
A concentrated study of the Buddhist art of China and Central Asia. Buddhist art of caves of the Six-dynasties period (220-589 C.E.) to the Tang period will be covered in-depth. Basic concepts of Buddhism, such as Hinayana, Mahayana, and Tantric Buddhism; arts related to specific sects; and the iconography and stylistic changes will be covered. Open to non-majors.
Prerequisite: upper-division standing.

ArH 419 - Japanese Buddhist Art (4)
A concentrated study of the Buddhist art of China and Central Asia. Buddhist art of caves of the Six-dynasties period (220-589 C.E.) to the Tang period will be covered in-depth. Basic concepts of Buddhism, such as Hinayana, Mahayana, and Tantric Buddhism; arts related to specific sects; and the iconography and stylistic changes will be covered. Open to non-majors.
Prerequisite: upper-division standing.

ArH 420 - Issues in Asian Art (4)
Issues in Asian art may be keyed to museum exhibitions or deal with thematic topics or specific media. Examples include Buddhist or other religious art, tomb art, ceramics, special topics in Korean art, or the work of Asian-American artists. Open to non-majors.
Prerequisite: upper-division standing.

ArH 421 - Issues in Asian Art (4)
Issues in Asian art may be keyed to museum exhibitions or deal with thematic topics or specific media. Examples include Buddhist or other religious art, tomb art, ceramics, special topics in Korean art, or the work of Asian-American artists. Open to non-majors.
Prerequisite: upper-division standing.

ArH 422U - Chinese Painting (4)
A concentrated study of the Chinese paintings from the 3rd century B.C.E. to the 18th century. Open to non-majors.
Prerequisite: upper-division standing.

ArH 422 - Chinese Painting (4)
A concentrated study of the Chinese paintings from the 3rd century B.C.E. to the 18th century. Open to non-majors.
Prerequisite: upper-division standing.

ArH 423U - Japanese Painting (4)
A concentrated study of Japanese painting from the 4th century to the 19th century. Buddhist paintings, ink paintings, and decorative paintings. Open to non-majors.
Prerequisite: upper-division standing.

ArH 423 - Japanese Painting (4)
A concentrated study of Japanese painting from the 4th century to the 19th century. Buddhist paintings, ink paintings, and decorative paintings. Open to non-majors.
Prerequisite: upper-division standing.

ArH 424U - Japanese Painting (4)
A concentrated study of Japanese painting from the 4th century to the 19th century. Buddhist paintings, ink paintings, and decorative paintings. Open to non-majors.
Prerequisite: upper-division standing.

ArH 424 - Japanese Painting (4)
A concentrated study of Japanese painting from the 4th century to the 19th century. Buddhist paintings, ink paintings, and decorative paintings. Open to non-majors.
Prerequisite: upper-division standing.

ArH 425 - Modern Japanese Painting (4)
Recent scholarship in the history of modern Japanese paintings and prints, from the Meiji, Taisho, and Showa periods covers major themes of Japan's westernization in a new light. The issues revolve around westernization: conflict and nationalism. New art forms, the revival of traditional styles, reclining women?ts theme, and the
gaze of subjects will be explored. Open to non-majors.

Prerequisite: upper-division standing.

ArH 426U - Modern Japanese Painting (4)
Recent scholarship in the history of modern Japanese paintings and prints, from the Meiji, Taisho, and Showa periods covers major themes of Japan’s westernization in a new light. The issues revolve around westernization: conflict and nationalism. New art forms, the revival of traditional styles, reclining women’s theme, and the gaze of subjects will be explored. Open to non-majors.

Prerequisite: upper-division standing.

ArH 426 - African Art (4)
Examination of selected African art forms, styles, and traditions. Emphasis on the context of the art and artist and their relationship to politics and society in African history. Open to nonmajors. This is the same course as BSt 470 and may be taken only once for credit.

Prerequisite: upper-division standing. Crosslisted as: BSt 470.

ArH 426U - African Art (4)
Examination of selected African art forms, styles, and traditions. Emphasis on the context of the art and artist and their relationship to politics and society in African history. Open to nonmajors. This is the same course as BSt 470 and may be taken only once for credit.

Prerequisite: upper-division standing. Crosslisted as: BSt 470.

ArH 431 - Women in the Visual Arts (4)
This course studies both the representation of women and gender and the art and patronage by women in various media (painting, sculpture, architecture, printmaking, photography, textiles and mixed media). Explores 19th century and 20th century America and Europe. This is the same course as WS 431 and may be taken only once for credit. Open to non-majors. Recommended preparation: ArH 206 (expected of art art history majors).

Prerequisite: upper-division standing. Crosslisted as: WS 431U.

ArH 431U - Women in the Visual Arts (4)
This course studies both the representation of women and gender and the art and patronage by women in various media (painting, sculpture, architecture, printmaking, photography, textiles and mixed media). Explores 19th century and 20th century America and Europe. This is the same course as WS 431 and may be taken only once for credit. Open to non-majors. Recommended preparation: ArH 206 (expected of art art history majors).

Prerequisite: upper-division standing. Crosslisted as: WS 431U.

ArH 432 - Issues in Gender and Art (4)
Research, reading, and discussion on sexual subjectivity and the construction of gender in visual images and various cultural contexts. May be keyed to regional exhibitions, collections, or symposia. Topics include: masculinity in ancient Rome, pornography and representation, surrealism, and sexuality. Open to nonmajors. Recommended preparation: ArH 206 and either ArH 204 or ArH 205 (expected of art art history majors).

Prerequisite: upper-division standing.

ArH 432U - Issues in Gender and Art (4)
Research, reading, and discussion on sexual subjectivity and the construction of gender in visual images and various cultural contexts. May be keyed to regional exhibitions, collections, or symposia. Topics include: masculinity in ancient Rome, pornography and representation, surrealism, and sexuality. Open to nonmajors. Recommended preparation: ArH 206 and either ArH 204 or ArH 205 (expected of art art history majors).

Prerequisite: upper-division standing.

ArH 449 - Art History Methods (4)
Seminar for juniors and seniors. Explores major approaches to the study of art history through readings, discussion, and essays. Includes the development of art history as a field and common methodologies such as iconography, gender theory, social art history, and post-modernism and post-structuralism. Open to nonmajors. Also offered for graduate-level credit as ArH 549 and may be taken only once for credit.

Prerequisite: at least three upper-division art history courses.

ArH 450 - Great Periods and Themes in Art and Architecture (4)
A concentrated study of the art and/or architecture of a major historical period or theme, for example, Pre-Columbian art and architecture or Medieval Venetian Architecture. May be repeated for credit with different topics. Open to nonmajors, Also offered for graduate-level credit as ArH 550. Recommended preparation: ArH 204, ArH 205, or ArH 206 (expected of art art history majors).

Prerequisite: upper-division standing.

ArH 486 - American Art and Architecture 17th through 19th Centuries (4)
ArH 486: Colonial through the Early Republic. ArH 487: Jacksonian to the 20th century. Open to non-majors. This is the first course in a sequence of two: ArH 486 and ArH 487. Recommended preparation: ArH 206 (expected of art art history majors).

Prerequisite: upper-division standing.

ArH 486U - American Art and Architecture 17th through 19th Centuries (4)
ArH 486: Colonial through the Early Republic. ArH 487: Jacksonian to the 20th century. Open to non-majors. This is the first course in a sequence of two: ArH 486 and ArH 487. Recommended preparation: ArH 206 (expected of art art history majors).

Prerequisite: upper-division standing.

ArH 487 - American Art and Architecture 17th through 19th Centuries (4)
ArH 487: Colonial through the Early Republic. ArH 488: Jacksonian to the 20th century. Open to non-majors. This is the second course in a sequence of two: ArH 486 and ArH 487. Recommended preparation: ArH 206 (expected of art art history majors).

Prerequisite: upper-division standing.

ArH 487U - American Art and Architecture 17th through 19th Centuries (4)
ArH 487: Colonial through the Early Republic. ArH 488: Jacksonian to the 20th century. Open to non-majors. This is the second course in a sequence of two: ArH 486 and ArH 487. Recommended preparation: ArH 206 (expected of art art history majors).
**ArH 491 - 20th Century Art (4)**
A chronological survey of modern and postmodern art in Europe and the U.S. in the 20th century. ArH 491: from Art Nouveau to Surrealism; ArH 492: from American Scene Painting through the rebellious sixties; ArH 493: from Conceptual art through the end of the century. This is the first course in a sequence of three: ArH 491, ArH 492, and ArH 493. Also offered as graduate-level credit as ArH 591 and may be taken only once for credit. Open to non-majors.

Prerequisite: ArH 206 and upper-division standing.

**ArH 492 - 20th Century Art (4)**
A chronological survey of modern and postmodern art in Europe and the U.S. in the 20th century. ArH 491: from Art Nouveau to Surrealism; ArH 492: from American Scene Painting through the rebellious sixties; ArH 493: from Conceptual art through the end of the century. This is the second course in a sequence of three: ArH 491, ArH 492, and ArH 493. Also offered as graduate-level credit as ArH 592 and may be taken only once for credit. Open to non-majors.

Prerequisite: ArH 206 and upper-division standing.

**ArH 493 - 20th Century Art (4)**
A chronological survey of modern and postmodern art in Europe and the U.S. in the 20th century. ArH 491: from Art Nouveau to Surrealism; ArH 492: from American Scene Painting through the rebellious sixties; ArH 493: from Conceptual art through the end of the century. This is the third course in a sequence of three: ArH 491, ArH 492, and ArH 493. Also offered as graduate-level credit as ArH 593 and may be taken only once for credit. Open to non-majors.

Prerequisite: ArH 206 and upper-division standing.

**ArH 499 - Contemporary Art II (4)**
A thematic examination of historical dimensions of contemporary art practices in the 21st century. Explores themes, movements and trends as much as individual artists or works of art. Places art into a broad historical and social context, and looks at cross-cultural and interdisciplinary connections. Suggested preparation: ArH 491, ArH 492, ArH 493, and ArH 498.

Prerequisite: ArH 206 and upper-division standing.

**ArH 500 - 20th Century Art (4)**
A chronological survey of modern and postmodern art in Europe and the U.S. in the 20th century. ArH 591: from Art Nouveau to Surrealism; ArH 592: from American Scene Painting through the rebellious sixties; ArH 593: from Conceptual art through the end of the century. This is the first course in a sequence of three: ArH 491, ArH 492, and ArH 493. Also offered as graduate-level credit as ArH 592 and may be taken only once for credit. Open to non-majors.

Prerequisite: at least three prior upper division art history courses.

**ArH 501 - Research (0-12)**
Terms, section, instructor and hours to be arranged. Consent of instructor and chair of the Department of Art required. (Credit to be arranged.)

**ArH 503 - Thesis (1-9)**
(Credit to be arranged)

**ArH 504 - Cooperative Education/Internship (0-12)**
Terms, section, instructor and hours to be arranged. Consent of instructor and chair of the Department of Art required. (Credit to be arranged.)

**ArH 505 - Reading and Conference (0-12)**
Terms, section, instructor and hours to be arranged. Consent of instructor and chair of the Department of Art required. (Credit to be arranged.)

**ArH 506 - Projects (1-9)**
(Credit to be arranged.)

**ArH 507 - Seminar (0-12)**
See department for course description. (Credit to be arranged.)

**ArH 510 - Selected Topics (0-12)**
See department for course description. (Credit to be arranged.)

**ArH 540 - History of Architecture (4)**
A history of architecture from Prehistory to Post-Modernism. Open to non-majors.

Prerequisite: Graduate-level standing and permission of instructor.

**ArH 549 - Art History Methods (4)**
Seminar for juniors and seniors. Explores major approaches to the study of art history through readings, discussion, and essays. Includes the development of art history as a field and common methodologies such as iconography, gender theory, social art history, and post-modernism and post-structuralism. Open to nonmajors. Also offered for undergraduate-level credit as ArH 449 and may be taken only once for credit.

Prerequisite: at least three prior upper division art history courses.

**ArH 550 - Great Periods and Themes in Art and Architecture (4)**
A concentrated study of the art and/or architecture of a major historical period or theme, for example, Pre-Columbian art and architecture or Medieval Venetian Architecture. May be repeated for credit with different topics. Open to nonmajors. Also offered for undergraduate-level credit as ArH 450.

Prerequisite: graduate-level standing and permission of instructor.

**ArH 591 - 20th Century Art (4)**
A chronological survey of modern and postmodern art in Europe and the U.S. in the 20th century. ArH 591: from Art Nouveau to Surrealism; ArH 592: from American Scene Painting through the rebellious sixties; ArH 593: from Conceptual art through the end of the century. This is the first course in a sequence of three: ArH 491, ArH 492, and ArH 493. Also offered as graduate-level credit as ArH 491 and may be taken only once for credit. Open to non-majors.

Prerequisite: graduate-level standing and permission of instructor.

**ArH 592 - 20th Century Art (4)**
A chronological survey of modern and postmodern art in Europe and the U.S. in the 20th century. ArH 591: from Art Nouveau to Surrealism; ArH 592: from American Scene Painting through the rebellious sixties; ArH 593: from Conceptual art through the end of the century. This is the second course in a sequence of three: ArH 491, ArH 492, and ArH 493. Also offered as graduate-level credit as ArH 492 and may be taken only once for credit. Open to non-majors.

Prerequisite: graduate-level standing and permission of instructor.

**ArH 599 - Contemporary Art II (4)**
A thematic examination of historical dimensions of contemporary art practices in the 21st century. Explores themes, movements and trends as much as individual artists or works of art. Places art into a broad historical and social context, and looks at cross-cultural and interdisciplinary connections. Suggested preparation: ArH 491, ArH 492, ArH 493, and ArH 498.

Prerequisite: ArH 206 and upper-division standing.
Prerequisite: graduate-level standing and permission of instructor.

ArH 593 - 20th Century Art (4)
A chronological survey of modern and postmodern art in Europe and the U.S. in the 20th century. ArH 591: from Art Nouveau to Surrealism; ArH 592: from American Scene Painting through the rebellious sixties; ArH 593: from Conceptual art through the end of the century. This is the third course in a sequence of three: ArH 591, ArH 592, and ArH 593. Also offered as undergraduate-level credit as ArH 493 and may be taken only once for credit. Open to non-majors.
Prerequisite: graduate-level standing and permission of instructor.

ArH 599 - Contemporary Art I (4)
A thematic examination of historical movements and trends as much as individual artists or works of art. Places art into a broad historical context. Emphasis on strategies, placing one's own work and that of others in historical contexts. No prerequisite required. Open to non-majors.

ArH 598 - Introduction to Typography and Communication Design (4)
Applies the fundamental design principles covered in 2-D design and color theory to the visual language of communication design—specifically typography. Projects address the various roles of typography within the discipline. Methods, strategies, and processes for thinking creatively and solving design problems are investigated. Manual skills with tools are developed. It's recommended that you take this class after or concurrently with Art 120. Open to non-majors with instructor's consent.
Prerequisite: Art 115. Corequisite: Art 120.

ArH 110 - Introduction to Typography and Communication Design for Non-Art Majors (4)
Introduction for non-art majors to the language of communication design. Addresses what graphic design is and examines the many ways in which design can engage audiences. Explores the language and media of graphic design, considering its conceptual and practical methodologies in order to generate an understanding of the ways which design can be framed, made, and used. Fosters a more nuanced conception of the larger discourse of graphic design.

Art 115 - Foundation Studio I: 2-D Design (4)
Studio course investigating the elements and principles of design and their application to a variety of visual design problems. Acquisition and application of design strategies drawn from both rational and non-rational modes for problem solving. Various approaches drawn from art history, aesthetics, and art criticism are considered for the purpose of critically evaluating art. Open to non-majors.

Art 116 - Color Theory (4)
Studio course investigating principles and methods of application in color theory. Physical properties, psychological effects, and historical symbolism for color. Art history, aesthetics, and art criticism are examined relative to various color issues. More advanced methods of critically evaluating one's own work and that of others. Exploration of both wet and dry media. All studio projects culminate with a class critique. It is highly recommended that students take Art 115 prior to this course. Open to non-majors.

Art 117 - Foundation Studio II: 3-D Design (4)
Introduces fundamental principles and their application through the concepts, processes and practices of three-dimensional design and continues the exploration of color theory. Students investigate physical properties of form, the interaction of forms in space, the inherent qualities of materials, basic methods of fabrication and methods for critically evaluating works of art and design. Illustrated lectures, reading, discussion and studio projects place the exploration within contemporary and art historical contexts. No prerequisite required. Open to non-majors with instructor's consent.

Art 118 - Computer Graphics for Art and Design (4)
Introduction to computer graphics as a technical and creative medium for art and design. Introduces concepts of vector and raster graphics, including digital type, image and device resolution, electronic color theory, layering and combining graphics, and translating between digital and physical media. Teaches methods to implement creative solutions with digital tools. Open to non-majors with instructor's consent.

Art 120 - Computer Graphics for Art and Design (4)
Introduction to computer graphics as a technical and creative medium for art and design. Introduces concepts of vector and raster graphics, including digital type, image and device resolution, electronic color theory, layering and combining graphics, and translating between digital and physical media. Teaches methods to implement creative solutions with digital tools. Open to non-majors with instructor's consent.

Art 131 - Introduction to Drawing I (4)
Introduction to observational, expressive, and formal modes of drawing. Critical approaches drawn from art history, aesthetics, and art criticism are examined relative to these modes of drawing to establish methods of evaluating art and placing one's own work and that of others in a historical context. Emphasis on strategies, methods, and techniques for translating
three-dimensional form and space onto a
two-dimensional surface using the language of
line and value, and the illusion of depth
and texture. Markmaking and its expressive
and descriptive qualities is examined. Open
to non-majors with instructor’s consent or
departmental approval.

Art 182 - Idea and Form (4)
Introduces an interdisciplinary approach to
understanding images and image systems,
their history, and their intersection with the
larger culture. With an emphasis on critical
thinking and analysis, the course investigates
the way social and cultural dynamics shape
meaning and perception in art and design.
Examples from art history, contemporary
practice, popular culture and
print/broadcast culture are examined
through illustrated lectures, discussion,
readings, writing assignments and studio
projects. Expected preparation: Art 117 and
119. Open to non-majors with instructors
consent or departmental approval.

Prerequisite: Art 115.

Art 199 - Special Studies (0-5)
(Credit to be arranged.)

Art 200 - Digital Page Design I (4)
Studio course introducing single and multi-
page document design. Projects embody the
entire process of creating a publication from
concept, through compositional and
typographic skills, clear use of hierarchy, and
pre-press. Emphasis is placed on work-flow
and project management for production of
documents in print and electronic media.
This course requires that students furnish a
laptop computer that meets the
departmental standards in terms of
hardware and software (see departmental
website for requirements). Open to non-
majors with instructors’ consent.

Prerequisite: Art 120.

Art 203 - Making and Meaning (4)
Explores the relationship of material,
method and process to the construction of
meaning in art practice. Students
experiment with various research methods
as a way to generate, inspire and inform
projects that reflect current topics of
interest in contemporary art and culture.
Course focus depends on instructor;
examples include personal narratives, time,
the constructed body, self and ritual, history
and memory, public space, concepts of
beauty. Maximum 4 credits. Open to non-
majors with instructor’s consent or
departmental approval.

Prerequisite: Art 182.

Art 210 - Digital Imaging and Illustration I
(4)
Studio course in digital image creation with
an emphasis on raster and vector-based
illustration. Hybrid illustration techniques of
mixing handmade work with digital imagery
and photography may also be explored.
Basic ways in which form communicates
meaning are parsed and explored. This
course requires that students furnish a
laptop computer that meets the
departmental standards for hardware and
software. See departmental site for
requirements.

Prerequisite: Art 120.

Art 224 - Narrative and Communication
Design (4)
The theme for this course is narrative
structures relating to printed matter and
motion. Projects explore visual languages,
storytelling, storyboards and the visual
essay. Problem solving, idea generation,
typography, point of view, conceptual
thinking and composition are reinforced.
Critical readings, group and individual
critiques, and written assignments support
visual design exploration.

Prerequisite: Art 120, Art 115 & Art 131.

Art 225 - Communication Design Systems
(4)
Introduction to communication design
systems, specifically relating to branding and
data visualization. Students develop strong
custom conceptual solutions and systems for
managing projects with large amounts of
information and branding applications.
Emphasis is placed on the expansion of a
strong design process and a continuing to
develop a personal visual language.

Prerequisite: Art 224.

Art 230 - Drawing Concepts I (4)
The course focuses on skills learned in
drawing courses and
embraces a transition from formal
observational methods to abstract
expressive modes of drawing. Students
explore historical and contemporary
strategies of visual analysis, surface and
space as tools for creative exploration and
employ analytical and verbal skills. Open to
non-majors with instructor’s consent or
departmental approval.

Prerequisite: Art 115 & Art 131.

Art 241 - Interaction Design Principles (4)
Studio course dealing in the fundamentals of
Interaction Design, incorporating the
concepts of sound graphic design principles
with user experience processes. Students
will examine a series of interfaces—from
everyday appliances to websites—learn to
analyze their effectiveness and explore
designs that better serve real human needs.
Topics include user interface design, product
design, information architecture and user
experience research methods.

Art 250 - Life Drawing I (4)
Developing skills for drawing the human
figure from observation in a variety of poses
and media. This is the first of a sequence of
three classes. Develops, skills in observation
and perception. Later, analytic skills are
combined with personal expression and
invention. A variety of media is used to
explore the implications of line and modeled
form to explore the figure in compositional
environments. The skeleton and muscles will
be studied in relationship to the model
poses. Open to nonmajors with instructor’s consent or departmental approval.

Art 254 - Typography I (4)

First course in a sequence on typography. Builds on the principles introduced in Art 118. Projects focus on typography as medium and message. Typographic history, including the history of letterforms and the construction and use of grids. Design projects range from purely textual to problems that require the successful integration of typography and image. Conceptual solutions are emphasized. Open to non-majors who have prerequisites and consent of the instructor. This course requires that students furnish a laptop computer that meets the departmental standards in terms of hardware and software (see departmental website for requirements).

Prerequisite: Art 118 and Art 120.

Art 255 - Two-dimensional Animation I (4)

Studio introduction to principles and processes of two-dimensional animation composed in digital form. Storytelling and animation skills are developed in projects that apply tools and techniques for writing, staging, movement, timing, key framing, editing, and the use of sound and music. The language and aesthetics of animation are investigated through the design and production of a two-dimensional animation. Focus may be placed on either pixel or vector graphics. Project planning and workflow are explored in response to technical requirements for presenting the work in multiple media delivery formats. Open to Non-majors. Recommended preparation: Art 115 and Art 119 or Art 120 (expected of art art history majors).

Art 257 - Introduction to Video Art (4)

Introduction to fundamental techniques of digital video production in the context of contemporary art practices. Topics cover a range of experimental and non-narrative forms, focusing on artists’ use of video and other related media theory. Technical information includes cinematography, camera operations and digital video editing. Open to Non-majors. Recommended preparation: Art 119 (expected of art art history majors).

Art 260 - Black and White Photography (4)

Studio introduction to black and white photography using both film-based darkroom and digital imaging techniques, including 35mm camera controls, film processing, enlargement, digital image capture, and basic digital image adjustment. Assignments focus on two dimensional design principles of line, shape, pattern, texture, symmetry, asymmetry, and vantage point, and culminate in a coherent photo story. While learning basic photographic techniques, students discuss form, content, and the aesthetics of photographic image-making. Studio includes lecture, demonstration, critique, and supervised lab work. Students must furnish a focusing film camera with adjustable f-stops and shutter speeds. Automatic cameras must have manual override.

Art 261 - Photoimaging I (4)

Studio introduction to concepts, techniques, practices, aesthetics, and ethics of photographic imaging and image-making with digital technology. Investigations in photographic media are enabled through a variety of digital imaging techniques, including retouching, color correction, filtering, masking, layering, and compositing.

Prerequisite: Art 261.

Art 270 - Introduction to Printmaking: Relief (4)

A studio focused course concentrating on the planographic printmaking processes traditionally identified as “relief printmaking”. This specialized technique will be presented utilizing the practice and concepts unique to historic, traditional/nontraditional and contemporary printmaking methodology. Monoprinting one of a kind image making and edition printing creating identical multiple images will be explored. Graphic languages developed through researching historical and contemporary influences will be presented to inspire and stimulate the students imagination and knowledge of graphic languages. Sequential thinking processes and theory will also be addressed. May be repeated twice for credit maximum 8 credits.

Art 271 - Introduction to Printmaking: Etching (4)

A studio focused course concentrating on the Intaglio method of Printmaking also identified as “Etching”. This specialized technique will introduce basic theories, practice and concepts unique to historic, traditional/nontraditional and contemporary Printmaking methodology. Monoprinting (one of a kind image making processes) and edition printing -sequential image making will be explored. Technical processes of black and white drypoint, etching and softground will be at the core of the students investigation. Understanding manipulation of technical processes unique to etching, additive and subtractive processes will be equally explored. Graphic languages developed through researching historical and contemporary influences will
Art 281 - Introduction to Painting I (4)  
A two-term sequence course that introduces the principles and practice of painting. Art 281: explores basic theory and use of color and composition. Assignments involve both conceptual approaches and direct observation using still life, figures and landscape. Art 282: moves from the basic theory and use of color and composition to assignments involving both direct observation using still life, figures and landscape and a more conceptual approach. Further explores the various painting styles, techniques, and media used throughout the early 20th century. This is the first course in a sequence of two: Art 281 and Art 282 which must be taken in sequence. Open to non-majors with instructor’s consent or departmental approval.  
Prerequisite: (required for art and art history majors; recommended for non-majors): Art 115, Art 117 and Art 131. 

Art 282 - Introduction to Painting II (4)  
A two-term sequence course that introduces the principles and practice of painting. Art 281: explores basic theory and use of color and composition. Assignments involve both conceptual approaches and direct observation using still life, figures and landscape. Art 282: moves from the basic theory and use of color and composition to assignments involving both direct observation using still life, figures and landscape and a more conceptual approach. Further explores the various painting styles, techniques, and media used throughout the early 20th century. This is the second course in a sequence of two: Art 281 and Art 282 which must be taken in sequence. Open to non-majors with instructor’s consent or departmental approval.  
Prerequisite: (required for art and art history majors; recommended for non-majors): Art 115, Art 117 and Art 131. 

Art 287 - Introduction to Jewelry and Metalsmithing (4)  
A beginning level course in the exploration of materials and processes basic to jewelry and light-metal design and fabrication. This includes high temperature soldering, use of jewelers’ saw, files, hammers, small casting, and stone setting. Emphasis on idea development and craftsmanship. This course is the foundation for continued work of increasing conceptual and technical complexity. Open to Non-majors.  
Recommended preparation: Art 117 (expected of art art history majors). 

Art 291 - Introduction to Sculpture I (4)  
The first of a two-term sequence course that provides an introduction to basic materials, processes, and concepts fundamental to sculpture. Students gain command of specific sculptural processes and materials while engaging in concept-generated assignments. Lectures and readings expose students to the work of modern and contemporary sculptors. Introduces methods used in making sculptural forms such as rendering from observation, mold making, wood construction, and assemblage. The use of clay, plaster, wood, and found objects/materials will be covered. In addition to the materials and processes introduced, a mixed-media approach is encouraged in all projects. Students at this level also begin experimentation with a range of alternative materials and process that support current practices in contemporary art. When restricted, this course is open to non-majors with instructor’s consent or departmental approval. Recommended preparation: Art 117 (expected of art art history majors). 

Art 295 - Sculpture: The Figure (4)  
The second of a two-term sequence course that provides an introduction to basic materials, techniques, and concepts fundamental to making sculpture. Students gain command of specific sculptural processes and materials while engaging in concept-generated assignments. Lectures and readings expose students to basic theory and the work of modern and contemporary sculptors. Builds upon the knowledge learned in Art 291 and continues in introducing fundamental methods in which to make sculptural forms. Students are introduced to oxy-acetylene welding, basic fabrication techniques, and metal shop safety as well as at least two of the following other processes: carving, body casting, fibers, soldering, and/ or working with reclaimed materials. In addition to the materials and processes demonstrated, a mixed-media approach is encouraged in all projects. Students at this level also begin experimentation with a range of alternative materials and process that support current practices in contemporary art. When restricted, this course is open to non-majors with instructor’s consent or departmental approval. Recommended preparation: Art 117 (expected of art art history majors). 

Art 294 - Water Media (4)  
The techniques and uses of watercolor, gouache, and other water-based mediums with attention to unique characteristics as painting mediums. Collage and mixed media may be included with water-soluble pencils and crayons. Lectures on historic uses of these media and discussions of the aesthetic possibilities for layering and transparencies. Recommended preparation: Art 115 Art 131 (expected of art art history majors). 

Art 295 - Sculpture: The Figure (4)  
The techniques and uses of watercolor, gouache, and other water-based mediums with attention to unique characteristics as painting mediums. Collage and mixed media may be included with water-soluble pencils and crayons. Lectures on historic uses of these media and discussions of the aesthetic possibilities for layering and transparencies. Recommended preparation: Art 115 Art 131 (expected of art art history majors). 

Art 299 - Sculpture: The Figure (4)  
The techniques and uses of watercolor, gouache, and other water-based mediums with attention to unique characteristics as painting mediums. Collage and mixed media may be included with water-soluble pencils and crayons. Lectures on historic uses of these media and discussions of the aesthetic possibilities for layering and transparencies. Recommended preparation: Art 115 Art 131 (expected of art art history majors). 

Art 296 - Digital Drawing and Painting (4)  
Studio course introducing concepts and processes in computer graphics through a set of defined problems examined through digital drawing and painting applications. Projects explore a range of tools and techniques used in the digital paint environment, including the acquisition of imagery. The unique features of digital tools and techniques are investigated in terms of their relationships with traditional materials and processes. A critical and conceptual framework is developed for the many uses of these tools in a fine art context through
an emphasis on using the computer as an artist's tool and the inclusion of digital art forms and processes into the mixed media studio. Open to non-majors with instructor's consent or departmental approval. Recommended preparation: Art 115, Art 119 and Art 131 (expected of art art history majors).

**Art 297 - Book Arts (4)**

This mixed media class will explore the book as an art form. The relationship of images and/or words will be explored in relationship to narrative and sequential structures. Traditional and experimental methods of binding will be taught. Lectures on the history of the artist's book and issues in imagery and/or typography will be presented. Class emphasizes an experimental and conceptual approach that integrates content and form. Open to non-majors with instructor's consent or departmental approval. Maximum 8 credits. Recommended preparation: Art 115  Art 131 (expected of art art history majors).

**Art 299 - Special Studies (0-4)**

(Credit to be arranged.)

**Art 300 - Digital Page Design II (4)**

Studio course in advanced composition using photo-illustration, vector illustration, and hybrid illustration techniques. Emphasis is placed on a conceptual approach to composition and creative process exemplified in the content, style, and execution of illustration projects. Open to non-majors with instructor's consent. This course requires that students furnish a laptop computer that meets the departmental standards in terms of hardware and software (see departmental website for requirements). Open to non-majors who have prerequisites and consent of the instructor. Prerequisite: Art 210 and and formal acceptance into the third year by Sophomore Portfolio Review.

**Art 310 - Digital Imaging and Illustration II (4)**

Studio course in advanced composition using photo-illustration, vector illustration, and hybrid illustration techniques. Emphasis is placed on a conceptual approach to composition and creative process exemplified in the content, style, and execution of illustration projects. Open to non-majors with instructor's consent. This course requires that students furnish a laptop computer that meets the departmental standards in terms of hardware and software (see departmental website for requirements). Open to non-majors who have prerequisites and consent of the instructor. Prerequisite: Art 210 and and formal acceptance into the third year by Sophomore Portfolio Review.

**Art 312 - Art in the Elementary School (4)**

Art studio: exercises, problems and projects using tools, media, materials and equipment applicable to elementary teaching levels. Development of attitudes toward art and understanding of child growth and development. Open to non-majors. A sequence focusing on concept development and solutions for communication design problems. History, theoretical approaches, critical readings, group and individual critiques, and written assignments support visual design exploration. Art 320: Focus is placed on the narrative and information structures, Historical context and ethical design concerns are addressed. These courses require that students furnish a laptop computer that meets the departmental standards in terms of hardware and software (see departmental website for requirements). This is the second course in a sequence of two: Art 320 and Art 321. Open to non-majors who have prerequisites and consent of the instructor. Prerequisite: Art 320.

**Art 320 - Communication Design Studio III (4)**

A sequence focusing on concept development and solutions for communication design problems. History, theoretical approaches, critical readings, group and individual critiques, and written assignments support visual design exploration. Art 320: Focus is placed on the narrative and information structures, Historical context and ethical design concerns are addressed. These courses require that students furnish a laptop computer that meets the departmental standards in terms of hardware and software (see departmental website for requirements). This is the first course in a sequence of two: Art 320 and Art 321. Prerequisite: Art 225 and and formal acceptance into the third year by Sophomore Portfolio Review.

**Art 327 - Intermediate Art and Social Practices (4)**

Students will choose a department on campus other than the art department and will become “artists in residence” for that dept during the quarter. They will work with people in their selected departments to create projects that respond to the department’s qualities, needs and interests. Students will document their process and projects, and will be graded on engagement in class and with their departments, journals, and projects. Recommended that it be taken in sequence. Open to non-majors. Recommended preparation: Art 227.

**Art 330 - Critical Theories in Art I (4)**

After a brief look at art of the 1960s and 1970s, this class will explore major theoretical and philosophical developments in the art world over the last quarter-century. Various themes and forms of art and individual artists will be examined as manifestations of specific theories and philosophies that have emerged during the past 25 years. Particular emphasis will be on art of the post-9/11 era. Material will be covered through readings, slide lectures and films as well as frequent visits to the
This course requires that students furnish a laptop computer that meets the departmental standards in terms of hardware and software (see departmental website for requirements). Open to non-majors who have prerequisites and consent of the instructor.

Prerequisite: Art 341 and formal acceptance into the third year of the graphic design program by Sophomore Portfolio Review.

Art 345 - Introduction to Motion Graphics for Designers (4)

Motion graphics for graphic designers. Apply compositional and typographic skills to sequential story-telling, using self-generated graphic and photographic imagery. Emphasis on work flow, storyboards, and clear communication with increasingly conceptual projects. Introduction to essential After Effects skills.

Art 350 - Life Drawing II (4)

This is the second class in the Life Drawing sequence. The course continues development of skills in drawing the human figure in a variety of poses working with a variety of materials with an emphasis on the muscular system. The student should be able to state the figure quickly, economically and in proportion. Open to non-majors with instructor's consent. Recommended preparation: Art 115, Art 131, Art 182 and Art 250 (expected of art history majors). Open to Non-majors with instructor consent.

Prerequisite: Art 131, Art 250 or have equivalent experience drawing from a live model.

Art 353 - Typeface Design (4)

Focus on developing the skills and critical thinking necessary for producing digital typefaces. History, technology and contemporary practices of the industry. Basic lettering skills and theory explored, to aid in the primary focus of creating a functional, flexible and useful typeface.

Prerequisite: Art 254.

Art 354 - Typography II (4)

The second course in a sequence on typography addressing more complex communication problems. An emphasis is placed on developing strong conceptual solutions and integrating text and image. Design, Art and Literary Theory is introduced and applied to the problem-solving process. Continued emphasis is placed on understanding design within a historical context. Projects to include large, multiple page formats, such as books, editorial design and annual reports. This course requires that students furnish a laptop computer that meets the departmental standards in terms of hardware and software (see departmental website for requirements). Open to non-majors who have prerequisites and consent of the instructor.

Prerequisite: Art 200 and Art 254 and formal acceptance into the third year of the graphic design program by Sophomore Portfolio Review.

Art 356 - Visual Storytelling (4)

Studio course exploring strategies of representation of stories, characters, and other narrative elements in time-based visual media. Focuses on the use and creation of storyboards, graphic novels, and animation in fiction and non-fiction storytelling. Recommended preparation: Art 119 and Art 255, Art 256, and/or Art 257 (expected of art history majors). Open to Non-majors with instructor consent.

Prerequisite: Art 119.

Art 357 - Intermediate Video (4)

Required preparation: Art 119 and Art 257.

Prerequisite: Art 119 and Art 257, Art 255, Art 256, and/or Art 257 (expected of art history majors). Open to Non-majors with instructor consent.

Prerequisite: Art 257.

Art 358 - Video, Design & Community (4)

Focus on collaboration in video production and community-based media. Production of a promotional/informational video for community organizations in Portland. History of community and independent media. Basic video and audio recording, post-production, interviewing, and group decision-making skills.

Art 360 - Photographic Exploration I (4)

Study of photography as visual language. Lectures, demonstrations, and extended assignments explore technical, aesthetic, and ethical issues of contemporary photography.
photographic communication. Working in either a documentary or conceptual approach, students begin development of their photographic portfolios, with emphasis placed on the photographic series.

Prerequisite: Art 260, Art 261, and Art 262.

Art 365 - Digital Portfolios for Visual Artists (4)

Studio course for visual artists focusing on design and development of digital portfolios. Concepts of portfolio development, graphic design, and interactive design are applied to create an effective communication of the artist's body of work. Digital production techniques are practiced as portfolios are assembled and published in a variety of print, time-based, and interactive formats.

Prerequisite: upper-division standing.

Art 367 - Design Business Practices (4)

Introduction to multidisciplinary, team-based, problem-solving practices in communication design. Majors in art/graphic design and non-art majors enroll in this course to form interdisciplinary teams working on hypothetical projects or case studies in current business problems, issues, and trends. Emphasis is placed on strategic design and planning, creative process, project management, and studio management. Students demonstrate skills in research, conceptual development, persuasive writing and communication, negotiation, initiative, collaboration, and team dynamics. May be taken twice for credit. Maximum 8 credits. Open to non-majors with instructor's consent.

Prerequisite: for Non-art majors, Art 100, Art 120, Art 200, Art 224, and Art 290. For Art majors, Art 225 and Art 254, and Art 200 & Art 210.

Art 370 - Topics in Printmaking Techniques (4)

Adding on to the principles and skills sets first investigated in lower-level printmaking this course explores additional techniques in printmaking. Varying practices, methodologies, and theories will be explored. Topics include but are not limited to etching, relief, mixed media print, screen printing, and mono-print. May be repeated for credit up to a maximum of 12 credits. Open to non-majors with instructor’s consent or departmental approval.

Recommended preparation: Art 270 and Art 271 (expected of art history majors).

Prerequisite: Art 270 and Art 271.

Art 371 - Intermediate Printmaking: Thematic Process (4)

This course further investigates and explores the theory, practice and contemporary/historical issues unique to printmaking. At an intermediate level this course is intended to guide and help students make connections between content, process, and context of their creative works. Students will thematically direct the content of their works while making the necessary connections surrounding methods and application of their ideas toward the processes unique to printmaking.

Recommended preparation: Art 270 and Art 271 and Art 370 (expected of art history majors).

Prerequisite: Two of the following: Art 270, Art 271 or Art 370.

Art 373 - Intermediate Sculpture I: Contemporary Approaches (4)

The first of a two-term sequence that focuses on contemporary sculptural practices. Through assignments that emphasize conceptual development and critical thinking, students are introduced to topics such as appropriation, time-based art, kinetics, interactivity, collaboration, and performance. The expanded field of sculpture is explored as potential materials extend into light, sound, motion, and the environment. Students begin to develop their own personal voice while developing the vocabulary by which to discuss ones own work and others. Students will work in a variety of media while continuing to utilize and build upon the technical and conceptual knowledge they acquired in lower-division sculpture courses. Open to non-majors with instructor’s consent. Recommended preparation: Art 270 and Art 271 or Art 370.

Prerequisite: Art 291 or Art 292.

Art 375 - Mold Making and Casting (4)

Exploration of the primary tools, materials, and processes used in mold making technology as it relates to contemporary sculptural practice. An overview of various methods of both rigid and flexible mold making will be explored as well as both solid and hollow shell casting techniques and materials. There will be an emphasis on studio etiquette, craftsmanship and production as well as creative applications of mold making and casting. The conceptual possibilities of the multiple will be explored. Students will also be exposed to contemporary artists who utilize mold making as a central part of their practice. Course builds upon the basic mold making introduced in lower division sculpture courses. Open to non-majors. Recommended preparation: Art 291 and Art 292 (expected of art history majors).

Prerequisite: Art 291 or Art 292.

Art 387 - Intermediate Jewelry and Metalsmithing (4)

Advanced metalworking techniques (e.g., forming methods) are introduced along with continued development of basic processes. Typical projects include designing and fabricating a series of three theme-related objects. Can include cast elements and incorporation of non-metal materials. Open to non-majors. Recommended preparation: Art 117 and Art 287 (expected of art history majors).
Prerequisite: Art 287.

**Art 388 - Welding and Fabrication (4)**

An upper-division sculpture course with a technical and material focus on welding and fabrication with steel. A variety of welding and fabrication processes are explored. Builds on skills developed in lower division courses and expands sculptural thinking, refines personal visual language, advances the development of ideas, and builds technical skills. Experimental materials, methods, and concepts are explored and encouraged. Research and presentations of living sculptors offer perspective and context for contemporary issues and discussions which investigate those issues. Open to non-majors. Recommended preparation: Art 291 and Art 292 (expected of art art history majors).

Prerequisite: Art 292.

**Art 389 - Metal Casting (4)**

An upper-level sculpture course that explores Bronze and Aluminum casting using the lost wax method. Builds on mold making and casting skills developed in lower-division sculpture courses. Students will expand their sculptural thinking, refine their personal visual language, and advance the development of their ideas. They will develop skills in lost wax casting as well as explore experimental materials, methods and concepts of casting in the context of contemporary sculpture. Research and presentations of living sculptors expand on this perspective and help create context for contemporary issues and in class discussions which investigate those issues. Open to non-majors. Recommended preparation: Art 291 and Art 292 (expected of art art history majors).

Prerequisite: Art 292.

**Art 391 - Drawing Concepts II (4)**

Second of a two-term sequence to be taken in the third year for students majoring in either painting or printmaking. Engages the theories and practices involved in the many processes, methods, and techniques of drawing. Analytical and critical thought is emphasized and part of the final end of the term review. Emphasis will be on postmodern concepts and theories as applied to studio practice in art since 1960. Readings, discussions, and research are expected to inform studio practice. Required for all transfer students in painting/drawing/printmaking. Strongly recommend Art History 206. Open to non-majors with consent of instructor.

Prerequisite: Art 182, Art 203, and Art 230.

**Art 392 - Intermediate Painting I (4)**

Study of various concerns in the expansion of technical and conceptual approaches dealing with form and content in both historical and contemporary practices. Students investigate a variety of ways of seeing that expands their approach to the subject and prepares them to begin development of an independent body of work in advanced painting. Students work both individually and in a group setting. Art 392: emphasis is placed on surface, materials, and other technical concerns, although issues dealing with the relationships of form and content are also discussed. Art 393: utilizing traditional and non-traditional technical processes while dealing with specific themes, students develop a personal vocabulary within a contemporary discourse. This is the first course in a sequence of two: Art 392 and Art 393 and must be taken in sequence. Open to non-majors who have prerequisites and consent of the instructor.

Prerequisite: Art 182, Art 203, Art 230, Art 281 and Art 282.

**Art 393 - Intermediate Painting II (4)**

Study of various concerns in the expansion of technical and conceptual approaches dealing with form and content in both historical and contemporary practices. Students investigate a variety of ways of seeing that expands their approach to the subject and prepares them to begin development of an independent body of work in advanced painting. Students work both individually and in a group setting. Art 392: emphasis is placed on surface, materials, and other technical concerns, although issues dealing with the relationships of form and content are also discussed. Art 393: utilizing traditional and non-traditional technical processes while dealing with specific themes, students develop a personal vocabulary within a contemporary discourse. This is the second course in a sequence of two: Art 392 and Art 393 and must be taken in sequence. Open to non-majors who have prerequisites and consent of the instructor.

Prerequisite: Art 182, Art 203, and Art 230.

**Art 399 - Special Studies (0-6)**

(Credit to be arranged.) Terms, section, instructor and hours to be arranged. Consent of instructor and chair of the Department of Art required.

**Art 403 - Thesis (1-12)**

(Credit to be arranged.) Terms, section, instructor and hours to be arranged. Consent of instructor and chair of the Department of Art required.

**Art 407 - Seminar (1-6)**

(Credit to be arranged.) Terms, section, instructor and hours to be arranged. Consent of instructor and chair of the Department of Art required.

**Art 405 - Reading or Studio and Conference (1-9)**

(Credit to be arranged.) Terms, section, instructor and hours to be arranged. Consent of instructor and chair of the Department of Art required.

**Art 406 - Projects (1-8)**

(Credit to be arranged.) Terms, section, instructor and hours to be arranged. Consent of instructor and chair of the Department of Art required.

**Art 407 - Seminar (1-6)**

(Credit to be arranged.) Terms, section, instructor, and hours to be arranged. Consent of instructor and chair of Department of Art required.
Art 408 - Workshop (1-6)
(Credit to be arranged.) Terms, section, instructor and hours to be arranged. Consent of instructor and chair of the Department of Art required.

Art 409 - Practicum (1-12)
(Credit to be arranged.)

Art 410 - Selected Topics (1-12)
(Credit to be arranged.) Maximum: 12 credits in one area.
Prerequisite: consent of instructor and chair of Department of Art.

Art 425 - A+D Projects (4)
Advanced development of graphic design skills with emphasis placed upon conceptual development, research, visual and written messages, multi-task time and materials management, budgets and production. Emphasis will be placed on studio management, teamwork and production.
Prerequisite: Successfully pass the sophomore review. Instructor approval.

Art 427 - Advanced Art and Social Practices (4)
Students work outside of the PSU campus. The class will select a particular area of Portland, or a specific institution like a high school or senior center. The students will then become “artists-in-residence” in that area or institution. The students will keep journals documenting information presented in the class, personal project ideas. General class engagement and journal writing will form the basis for grades. Open to non-majors.
Prerequisite: Art 227 or Art 327 or consent of instructor.

Art 430 - Critical Art Theories II (4)
Artwork and artists of the 21st century are examined with in the context of contemporary art theory. A thematic rather than a chronological approach will be used when examining theoretical, philosophical and socio-cultural aspects. Material will be presented through in-class instruction and field trips.
Prerequisite: Art 330.

Art 436 - Painting Topical Issues (4)
Advanced painting problems based on various subjects. Work may include various media, such as oils, acrylics, and mixed media. May be offered with specific subtitles such as Figure Painting or Landscape Painting. Maximum: 8 credits. Open to non-majors with instructor’s consent. Also offered for graduate-level credit as Art 536 and may be taken only once for credit. This is the first course in a sequence of two: Art 436 and Art 437 and must be taken in sequence.
Prerequisite: Art 392 and Art 393.

Art 437 - Painting Topical Issues (4)
Advanced painting problems based on various subjects. Work may include various media, such as oils, acrylics, and mixed media. May be offered with specific subtitles such as Figure Painting or Landscape Painting. Maximum: 8 credits. Open to non-majors with instructor’s consent. Also offered for graduate-level credit as Art 537 and may be taken only once for credit. This is the second course in a sequence of two: Art 436 and Art 437 and must be taken in sequence.
Prerequisite: Art 436.

Art 440 - Interactive Team (4)
Interactive media design and development for internal and external community clients. Design solutions are presented, critiqued, and revised based on initial and ongoing client contact. Sites are developed, tested, and maintained on web servers. Team-based design and development process is coordinated through project management practices. Emphasis is placed on strategic and tactical design process, industry standards, usability studies, business proposals, design documents, and other professional practices. This course requires that students furnish a laptop computer that meets the departmental standards in terms of hardware and software (see departmental website for requirements). Also offered for graduate-level credit as Art 540 and may be taken only once for credit.
Prerequisite: Art 341 and Art 342.

Art 441 - Interface Design (4)
Studio course in Interaction Design, with an emphasis on design concepts and techniques in several media including mobile and non-conventional interfaces. Thorough examination of design trends, usability testing and prototyping, and communicating content within the interactive space. Topics include interaction design patterns, user experience, environmental design, information architecture, and understanding industry standards in UX design.
Prerequisite: Art 341.

Art 450 - Life Drawing III (4)
The third course in the life drawing sequence. If students have had the preparation of prior classes in learning to draw the figure accurately from observation and have learned a little about basic anatomy then they will continue to develop skills in drawing the human figure in a variety of poses with the addition of compositions dealing with two or more figures when possible. Emphasis on compositional and expressive means Use of variety of materials. Recommended that it be taken in sequence. Open to non-majors with instructor’s consent.
Prerequisite: Art 350.

Art 455 - Time-Based Art Studio (4)
Advanced studio course focused on production of time-based arts including video art, animation, sound, performance, experimental film, installation, and other interdisciplinary forms. Course content focuses on the representation of time in art.
Prerequisite: Art 255, Art 257 or consent of instructor.

Art 457 - Low Tech Cinema (4)
This studio course uses readily accessible technologies and inexpensive techniques to create media artwork. Course topics include cell phones and mobile devices, conceptual and text-based movies, handmade 16mm film techniques, toy cameras, diary videos, consumer-grade analog video equipment including VHS, glitch art, media appropriation, and hacking. Also offered for graduate credit as Art 557 and may be taken only once for credit.
Prerequisite: Upper-division standing.

Art 461 - Photographic Exploration II (4)
Continuation of Art 360 Photographic Exploration I, culminating in the completion and presentation of a final photographic
portfolio. Multiple portfolio formats are possible. Graduate students also complete original research or critical study on either a photographer or photographic technique. Also offered for graduate-level credit as Art 561 and may be taken only once for credit.

Prerequisite: Art 360.

Art 462 - Professional Practices in Photography (4)
Introduces senior and graduate students to the photography profession in its diverse forms and the commercial operation of photographic studios. Projects investigate one or more specialized forms of photographic practice, such as product, architectural, portrait, landscape, photo-illustration, or immersive photography. Specialized techniques in lighting and digital imaging may be explored. Also offered for graduate-level credit as Art 562 and may be taken only once for credit.

Prerequisite: Art 360.

Art 469 - Communication Design Internship (4)
An advanced, elective course with a required 100-hour placement in a professional design setting. Students conceive design, and develop client-oriented projects to gain experience in professional design practices, including design strategy, cost estimation, preparation of the creative brief, effective written and verbal presentation, team dynamics, client meetings, and project management. In-class sessions focus on topics and concerns related to professional practice. Stress is placed on understanding both the client’s and designer’s point of view in the conceptual process. Portfolio and permission of the instructor required. Pre-registration in this class is possible. However, final approval and acceptance into this class is based on portfolio review and instructor approval. This course requires that students furnish a laptop computer that meets the departmental standards in terms of hardware and software (see departmental website for requirements). Maximum: 8 credits.

Prerequisite: Art 321, Art 341, and Art 354.

Art 470 - Contemporary Design Projects (4)
Required for all design majors in their senior year. Students pursue their own body of work with a focus on the development of independent mechanisms for generating design problems and solutions. Emphasis is placed on accessing independent modes of analysis. Students learn to clarify concepts and execution methods in a sustained and integrated body of work that demonstrates refinement of visual and verbal communication ideas. The role of theory and criticism is emphasized. This course requires that students furnish a laptop computer that meets the departmental standards in terms of hardware and software (see departmental website for requirements).

Prerequisite: senior status in the major and Art 321, Art 341, Art 354, and Art 470.
Also offered for graduate-level credit as Art 590 and may be taken only once for credit. This is the first course in a sequence of two: Art 490 and Art 491 and must be taken in sequence.

Prerequisite: Art 392, Art 393, and Art 391.

**Art 491 - Advanced Painting II (4)**

A two-term sequence offering a contemporary view of painting through the exploration of various media, subject matter, and conceptual approaches. Research, idea generation, and production will be emphasized. Art 490/590: Students begin to develop an independent body of work within a historical and theoretical context. This course concentrates on working methods of research and execution through closely guided assistance. Art 491/591: Building on the processes and research practiced in Art 490/590, students complete a focused and unified body of work sustained by specific critical analysis. Courses must be taken in sequence. Open to non-majors who have prerequisites and consent of the instructor. Also offered for graduate-level credit as Art 591 and may be taken only once for credit. This is the second course in a sequence of two: Art 490 and Art 491 and must be taken in sequence.

Prerequisite: Art 490, Art 392, Art 393, and Art 391.

**Art 492 - Contemporary Studio Practice (4)**

This course allows students to pursue their own body of work as a thesis project. Providing the basis for continuity and sustained concentration within a long-term project, this course emphasizes laying a foundation for research and concentrates on developing a mechanism to design and access independent modes of analysis. Students learn to clarify ideas/images in a personal body of work. Role of theory and criticism is emphasized. Maximum: 8 credits.

Prerequisite: Formal departmental admission into the BFA program.

**Art 493 - Advanced Drawing Mixed Media (4)**

This class represents the culminating experience in drawing and mixed media. Students are expected to develop a unified body of work that reflects and is informed by art history and contemporary theory. Open to non-majors who have prerequisites and consent of the instructor. Also offered for graduate-level credit as Art 593 and may be taken only once for credit. Maximum: 8 credits.

Prerequisite: Art 391.

**Art 494 - Advanced Sculpture I (4)**

A two-term sequence that continues an exploration of contemporary sculptural practices. Building upon the knowledge acquired in intermediate and introductory sculpture courses, there is an emphasis on conceptual development, research, and production as an advanced level sculpture student. Through readings, research projects and critiques, students will further develop the ability to discuss their own work as well as others both verbally and in writing. Art 494/594: Under closely guided assistance, students will begin the process of developing an independent, cohesive body of work within a historical and theoretical context. Art 495/595: Building upon the knowledge acquired in Art 494/594, students will complete a cohesive, independent body of work within a historical and theoretical context. Courses must be taken in sequence. Also offered for graduate-level credit as Art 594 and may be taken only once for credit. Open to non-majors with instructor’s consent.

Prerequisite: Two of the following: Art 373, Art 374, Art 375, Art 388 or Art 389.

**Art 495 - Advanced Sculpture II (4)**

A two-term sequence that continues an exploration of contemporary sculptural practices. Building upon the knowledge acquired in intermediate and introductory sculpture courses, there is an emphasis on conceptual development, research, and production as an advanced level sculpture student. Through readings, research projects and critiques, students will further develop the ability to discuss their own work as well as others both verbally and in writing. Art 494/594: Under closely guided assistance, students will begin the process of developing an independent, cohesive body of work within a historical and theoretical context. Art 495/595: Building upon the knowledge acquired in Art 494/594, students will complete a cohesive, independent body of work within a historical and theoretical context. Courses must be taken in sequence. Also offered for graduate-level credit as Art 595 and may be taken only once for credit. Open to non-majors with instructor’s consent.

Prerequisite: Art 494 or Art 594.

**Art 497 - A History of Art and Social Practice (4)**

A history of social practice in art. Investigate the current critiques, debates and issues surrounding its current state in relation to its historical context. The course will examine social practice from 1920 to present and touch on the key movements. Will place a strong emphasis on contemporary examples of social practice art through readings, assignments, and online participation. This course will give a historic and critical context for social art. Open to non-majors. Also offered for graduate-level credit as Art 597 and may be taken only once for credit.

Prerequisite: Upper-division standing.

**Art 498 - BFA Thesis Exhibition (4)**

This is a directed study course in studio production and exhibition presentation and it should be taken in the last quarter of the BFA Program. Students prepare and produce a cohesive body of work to be presented in a Thesis Exhibition and a final oral review, concluding with the BFA committee’s final recommendation. Required for all BFA students.

Prerequisite: Formal departmental admission into the BFA program and Art 492.

**Art 501 - Research (1-9)**

(Credit to be arranged.) Terms, section, instructor and hours to be arranged. Consent of instructor and chair of the Department of Art required.

**Art 502 - Art Studio for Elementary and Secondary Education (1-6)**

Designed for the education student who may elect regular studio instruction in sculpture, painting, drawing, ceramics, jewelry and metalsmithing, textiles, or graphic design as fits the need of the student's teaching concentration. Arrangements must be made for placement in specific studio classes. Enrollment restricted to elementary education M.A.T./ M.S.T. candidates and art students in a certification program only. Credit not transferable to any other graduate program. Maximum: 18 credits.
Art 503 - Thesis (1-9)
(Credit to be arranged.)

Art 504 - Cooperative Education/Internship (1-9)
(Credit to be arranged.) Terms, section, instructor and hours to be arranged. Consent of instructor and chair of the Department of Art required.

Art 505 - Reading or Studio and Conference (1-9)
(Credit to be arranged.) Terms, section, instructor and hours to be arranged. Consent of instructor and chair of the Department of Art required.

Art 506 - Projects (1-8)
(Credit to be arranged.) Terms, section, instructor and hours to be arranged. Consent of instructor and chair of the Department of Art required.

Art 507 - Seminar (1-6)
(Credit to be arranged.) Terms, section, instructor, and hours to be arranged. Consent of instructor and chair of the Department of Art required.

Art 508 - Workshop (1-6)
(Credit to be arranged.) Terms, section, instructor and hours to be arranged. Consent of instructor and chair of the Department of Art required.

Art 510 - Selected Topics (1-8)
(Credit to be arranged.) Maximum: 12 credits in one area.
Prerequisite: consent of instructor and chair of Department of Art.

Art 514 - Art Methods For Secondary School Teachers (4)
Methods and materials for teaching and coordination of art programs in grades 5-12, with an emphasis on organizing historical, aesthetic, critical and studio demonstrations, lectures, and classroom/model presentations. Translating theory(ies) into practice(s) will be a continuing and ongoing focus of the classes in lessons, research and readings. Students will develop Art lessons and programs that reflect current state and national standards. Art 514 is an introduction to the history of Art Education, the methods of instruction, philosophy of art education, and organization of art materials and tools. Art 515 explores the current best practices and issues in Art Education, technology (media-computer) application to art, continuing research/issues in art education, Practical and contemporary issues in public/private education. This is the first course in a sequence of two: Art 514 and Art 515. Open to non-majors with instructor's consent.
Prerequisite: Admission into the Art Education GTEP program.

Art 515 - Art Methods For Secondary School Teachers (4)
Methods and materials for teaching and coordination of art programs in grades 5-12, with an emphasis on organizing historical, aesthetic, critical and studio demonstrations, lectures, and classroom/model presentations. Translating theory(ies) into practice(s) will be a continuing and ongoing focus of the classes in lessons, research and readings. Students will develop Art lessons and programs that reflect current state and national standards. Art 514 is an introduction to the history of Art Education, the methods of instruction, philosophy of art education, and organization of art materials and tools. Art 515 explores the current best practices and issues in Art Education, technology (media-computer) application to art, continuing research/issues in art education, Practical and contemporary issues in public/private education. This is the first course in a sequence of two: Art 514 and Art 515. Open to non-majors with instructor's consent.
Prerequisite: Admission into the Art Education GTEP program.

Art 540 - Interactive Team (4)
Interactive media design and development for internal and external community clients. Design solutions are presented, critiqued, and revised based on initial and ongoing client contact. Sites are developed, tested, and maintained on web servers. Team-based design and development process is coordinated through project management practices. Emphasis is placed on strategic and tactical design process, industry standards, usability studies, business proposals, design documents, and other professional practices. This course requires that students furnish a laptop computer that meets the departmental standards in terms of hardware and software (see departmental website for requirements). Also offered for undergraduate-level credit as Art 440 and may be taken only once for credit.
Prerequisite: Graduate-level standing and instructor's consent.

Art 557 - Low Tech Cinema (4)
This studio course uses readily accessible technologies and inexpensive techniques to create media artwork. Course topics include cell phones and mobile devices, conceptual and text-based movies, handmade 16mm film techniques, toy cameras, diary videos, media. May be offered with specific subtitles such as Figure Painting or Landscape Painting. Maximum: 8 credits. Open to non-majors with instructor's consent. Also offered for undergraduate-level credit as Art 436 and may be taken only once for credit.
Prerequisite: Graduate-level standing and instructor's consent.

Art 562 - Painting Topical Issues (4)
Advanced painting problems based on various subjects. Work may include various media, such as oils, acrylics, and mixed media. May be offered with specific subtitles such as Figure Painting or Landscape Painting. Maximum: 8 credits. Open to non-majors with instructor's consent. Also offered for undergraduate-level credit as Art 436 and may be taken only once for credit.
Prerequisite: Graduate-level standing and instructor's consent.

Art 530 - Critical Art Theories II (4)
Artwork and artists of the 21st century are examined with in the context of contemporary art theory. A thematic rather than a chronological approach will be used when examining theoretical, philosophical and socio-cultural aspects. Material will be presented through in-class instruction and field trips.
Prerequisite: Admission into the MFA in Contemporary Art Practice program.

Art 536 - Painting Topical Issues (4)
Advanced painting problems based on various subjects. Work may include various media, such as oils, acrylics, and mixed media. May be offered with specific subtitles such as Figure Painting or Landscape Painting. Maximum: 8 credits. Open to non-majors with instructor's consent. Also offered for undergraduate-level credit as Art 436 and may be taken only once for credit.
Prerequisite: Graduate-level standing and instructor's consent.

Art 537 - Painting Topical Issues (4)
Advanced painting problems based on various subjects. Work may include various media, such as oils, acrylics, and mixed media. May be offered with specific subtitles such as Figure Painting or Landscape Painting. Maximum: 8 credits. Open to non-majors with instructor's consent. Also offered for undergraduate-level credit as Art 436 and may be taken only once for credit.
Prerequisite: Graduate-level standing and instructor's consent.
Art 561 - Photographic Exploration II (4)

Continuation of Art 360 Photographic Exploration I, culminating in the completion and presentation of a final photographic portfolio. Multiple portfolio formats are possible. Graduate students also complete original research or critical study on either a photographer or photographic technique. Also offered for undergraduate-level credit as Art 461 and may be taken only once for credit.

Prerequisite: Graduate-level standing and instructor's consent.

Art 562 - Professional Practices in Photography (4)

Introduces senior and graduate students to the photography profession in its diverse forms and the commercial operation of photographic studios. Projects investigate one or more specialized forms of photographic practice, such as product, architectural, portrait, landscape, photo-illustration, or immersive photography. Specialized techniques in lighting and digital imaging may be explored. Also offered for undergraduate-level credit as Art 462 and may be taken only once for credit.

Prerequisite: Graduate-level standing and instructor's consent.

Art 568 - Studio Practice: Workshop (2)

This course is a co-requisite to Art 580 Studio Practice: Directed Studies. In this workshop the focus will be on group dialogue and peer critique of individual and collaborative work with an emphasis on the relationship between research, production and presentation. In addition to requiring that students experiment with new methods, materials and modes of research in regard to their studio work, Art 578 develops students' ability to assess the strength of developing work, enhances their ability to speak about their work and the work of their peers and gives them a wider view into issues and aspects of studio production. Includes reading assignments, student-led discussion, guest speakers and field trips. May be repeated for credit. Maximum credits 24. Required for MFA.

Prerequisite: Admission into the MFA in Contemporary Art Practice program.

Art 580 - Studio Practice: Directed Studies (2)

Tutorial and directed study in studio production with a supervising faculty member. In-depth discussions and assessment of graduate student's studio work-in-progress in relation to contemporary art practices and criticism, historical practices, technical and formal concerns and/or related interdisciplinary interests. Directed assignments and course of study will be given as appropriate. May be repeated for credit. Maximum credits 40. Required for MFA.

Prerequisite: Admission into the MFA in Contemporary Art Practice program.

Art 581 - MFA Graduate Seminar I: Special Topics in Contemporary Art (2)

Examines selected issues in contemporary art and culture. The given instructor's current research interests determine course material. Examples of topics include: post-colonialism and Diaspora; issues in feminism; gender and queer studies; modernisms and modernity; new technologies and digital culture; autobiography and memoir; cultural production and censorship; globalization and new economies of art. Course format consists of assigned readings, discussion and a writing component. Field trips, student presentations, screenings and assigned lectures may also be included. May be repeated for credit. Maximum credits 4. Required for MFA.

Prerequisite: Admission into the MFA in Contemporary Art Practice program.

Art 582 - MFA Graduate Seminar II: Writing and Research (2)

Explores the role of writing and research in contemporary art practice. Course materials include library research and developing bibliographies relevant to students' studio practice, discussion of methodologies and practices of contemporary art production. Preparatory course for written component of the MFA exhibition project: second-year students are expected to develop an abstract and outline for their exhibition project. May be repeated for credit. Maximum credits 4. Required for MFA.

Prerequisite: Admission into the MFA in Contemporary Art Practice program.

Art 583 - MFA Graduate Seminar III: Teaching Visual Culture (2)

Explores teaching at local and national institutions as preparation for teaching in higher ed. This seminar includes curriculum development, syllabi development, assessment, educational objectives reading and discussion of post-modern theory and other matters in the area of art education and visual culture. Required for MFA. Maximum credits 2.

Prerequisite: Admission into the MFA in Contemporary Art Practice program.

Art 584 - Social Practice: Directed Studies (2)

Tutorial and directed study in social practice production with a supervising faculty member. In-depth discussions and assessment of graduate student's work-in-progress in relation to contemporary art practices and criticism, historical practices, technical and formal concerns and/or related interdisciplinary interests. Directed assignments and course of study will be given as appropriate. May be repeated for credit. Maximum credits 20. Required for MFA.

Prerequisite: Admission into the MFA in Contemporary Art Practice program.

Art 585 - MFA Graduate Seminar IV: Professional Practices (2)

Explores practical issues of career development for professional artists including preparing a portfolio, grant writing, C.V. writing, applying for teaching positions and residencies, working with museums and galleries, working in and with public, nonprofit and community arts organizations. The course includes guest speakers and individual research projects. Required for MFA.

Prerequisite: Admission into the MFA in Contemporary Art Practice program.

Art 586 - Visiting Artist Program/Group Critique (2)

A critique-based course focusing on the studio production of the individuals enrolled. Students are expected to help foster and develop an environment for serious and sophisticated peer review. The work of
visiting artists will be presented. Visiting artists participate in group critiques, as well as conduct individual studio critiques. May be repeated for credit. Maximum credits 12. Required for MFA.

Prerequisite: Admission into the MFA in Contemporary Art Practice program.

Art 491/591: Building on research and execution through closely course concentrates on working methods of a historical and theoretical context. This will develop an independent body of work within emphasized. Art 490/590: Students begin to generation, and production will be conceptual approaches. Research, idea exploration of various media, subject matter, and conceptual approaches. Research, idea generation, and production will be emphasized. Art 490/590: Students begin to develop an independent body of work within a historical and theoretical context.

A two-term sequence offering a contemporary view of painting through the exploration of various media, subject matter, and conceptual approaches. Research, idea generation, and production will be emphasized. Art 490/590: Students begin to develop an independent body of work within a historical and theoretical context.

This course concentrates on working methods of research and execution through closely guided assistance. Art 491/591: Building on the processes and research practiced in Art 490/590, students complete a focused and unified body of work sustained by specific critical analysis. Courses must be taken in sequence. Open to non-majors who have prerequisites and consent of the instructor. Also offered for undergraduate-level credit as Art 491 and may be taken only once for credit. This is the first course in a sequence of two: Art 590 and Art 591.

Prerequisite: Graduate-level standing and instructor's consent.

Art 493/593: Building upon the knowledge acquired in intermediate and introductory sculpture courses, there is an emphasis on conceptual development, research, and production as an advanced level sculpture student. Through readings, research projects and critiques, students will further develop the ability to discuss their own work as well as others both verbally and in writing. Art 494/594: Under closely guided assistance, students will begin the process of developing an independent, cohesive body of work within a historical and theoretical context. Courses must be taken in sequence. Also offered for undergraduate-level credit as Art 495 and may be taken only once for credit. Open to non-majors with instructor's consent.

Prerequisite: Graduate-level standing and instructor's consent.

Art 590 - Advanced Painting (4)

A two-term sequence that continues an exploration of contemporary sculptural practices. Building upon the knowledge acquired in intermediate and introductory sculpture courses, there is an emphasis on conceptual development, research, and production as an advanced level sculpture student. Through readings, research projects and critiques, students will further develop the ability to discuss their own work as well as others both verbally and in writing. Art 494/594: Under closely guided assistance, students will begin the process of developing an independent, cohesive body of work within a historical and theoretical context.

This course is a co-requisite to Art 584 Social Practice (4)

A history of social practice in art. Investigate the current critiques, debates and issues surrounding its current state in relation to its historical context. The course will examine social practice from 1920 to present and touch on the key movements. Will place a strong emphasis on contemporary examples of social practice art through readings, assignments, and online participation. This course will give a historic and critical context for social art. Open to non-majors. Also offered for undergraduate-level credit as Art 497 and may be taken only once for credit.

Prerequisite: Graduate-level standing.

Art 598 - Social Practice: Workshop (2)

This course is a co-requisite to Art 584 Social Practice: Directed Studies. In this workshop the focus will be on the creative aspects involved in social practice rather than theory. Formulate and work on collaborative public projects, discuss the creative aspect and practical application of art and social practice. May be repeated for credit. Maximum credits 20. Required for MFA.
Prerequisite: Admission into the MFA in Contemporary Art Practice program.

Art 599 - Exhibition Critique (2)
Public presentation of MFA exhibition project and MFA exhibition lecture; production of written MFA exhibition statement with the student’s individual MFA advisor, graduate faculty and graduate program coordinator. Required for MFA. Maximum credits 2.
Prerequisite: Admission into the MFA in Contemporary Art Practice program.

ASc - Arts & Sciences
ASc 199 - Special Studies (1-4)
(Credit to be arranged.)
ASc 399 - Special Studies (1-4)
(Credit to be arranged.)
ASc 404 - Cooperative Education/Internship (1-12)
(Credit to be arranged.)
ASc 405 - Reading and Conference (1-8)
(Credit to be arranged.)
ASc 406 - Special Projects (1-8)
(Credit to be arranged.)
ASc 408 - Workshop (1-8)
(Credit to be arranged.)
ASc 409 - Practicum (1-12)
(Credit to be arranged.)
ASc 410 - Selected Topics (1-12)
(Credit to be arranged.)
ASc 504 - Cooperative Education/Internship (1-12)
(Credit to be arranged.)
ASc 509 - Practicum (1-12)
(Credit to be arranged.)
ASc 510 - Selected Topics (1-6)
(Credit to be arranged.)

ASL - American Sign Language
ASL 101 - American Sign Language (4)
Basic mastery of American Sign Language (ASL). Covers ASL vocabulary, grammatical structure, and elements of Deaf culture. Includes sign language practice in class and in the Deaf community. This is the first course in a sequence of three: ASL 101, ASL 102, and ASL 103.

ASL 102 - American Sign Language (4)
Continuation of American Sign Language with the goal of expanding the student’s vocabulary and conversational skills. Students will also gain awareness of Deaf culture. Placement interview may be required. This is the second course in a sequence of three: ASL 101, ASL 102, and ASL 103. Expected preparation: ASL 101 or proficiency at 101 level.

ASL 103 - American Sign Language (4)
Continuation of American Sign Language aimed at intermediate proficiency. Emphasizes enhanced vocabulary, expressive and receptive skills, and communication interactions in the language and culture of the Deaf. This is the third course in a sequence of three: ASL 101, ASL 102, and ASL 103. Expected preparation: ASL 102 or proficiency at 102 level.

ASL 201 - Second Year American Sign Language (4)
Expansion and refinement of first-year comprehension and production skills; expansion of grammatical and lexical repertoires through task-based instruction in transactions such as asking/giving directions, making plans, describing and identifying people, places and things, giving simple instructions, and telling what happened. This is the first course in a sequence of three: ASL 201, ASL 202, and ASL 203. Expected preparation: ASL 203 for ASL 201, ASL 202 for ASL 203.

ASL 202 - Second Year American Sign Language (4)
Expansion and refinement of first-year comprehension and production skills; expansion of grammatical and lexical repertoires through task-based instruction in transactions such as asking/giving directions, making plans, describing and identifying people, places and things, giving simple instructions, and telling what happened. This is the second course in a sequence of three: ASL 201, ASL 202, and ASL 203.

ASL 203 - Second Year American Sign Language (4)
Expansion and refinement of first-year comprehension and production skills; expansion of grammatical and lexical repertoires through task-based instruction in transactions such as asking/giving directions, making plans, describing and identifying people, places and things, giving simple instructions, and telling what happened. This is the third course in a sequence of three: ASL 201, ASL 202, and ASL 203.

ASL 299 - Special Studies (1-8)
(Credit to be arranged.)

ASL 330 - Deaf Culture (4)
Introduction to major aspects of American Deaf Culture such as the history of deaf culture and community, its art, literature, folklore and language (American Sign Language), including current attitudes, movements, policies, and trends that affect the Deaf as a linguistic minority.

ASL 399 - Special Studies (1-8)
Credit to be arranged.

BA - Business Administration
BA 101 - Introduction to Business and World Affairs (4)
Introduction to the business firm operating in the local, national, and global marketplace. Emphasizes the integration of the various functional areas of business as the firm evolves from its entrepreneurial origins to a mature corporation.

BA 205 - Business Communications Using Technology (4)
Provides students with the tools that are needed to collect, organize, and present information in a business environment. Students will learn how to use library and Internet resources to collect information. Word processing, spreadsheet, and graphics applications will be used to organize and present business information. Students will be introduced to business report writing, developing and delivering a persuasive presentation, and electronic-mail methods for team based communication.
Prerequisite: BA 101.

BA 211 - Fundamentals of Financial Accounting (4)
Assists students in developing an understanding of financial statements and the tools used by external users such as lenders, shareholders, and competitors to
evaluate the performance of the firm. Balance sheets, income statements, statements of cash flows, and industry reports will be used to introduce topics such as: assessing risk, liquidity, solvency, operating efficiency, and profitability of the firm.

Prerequisite: BA 101.

**BA 213 - Decision Making with Accounting Information (4)**

Designed to aid students in developing effective decision making skills. Course elements include: understanding the organization as a system, information assessment, cash management, operations and capital budgeting, manufacturing cost systems, cost control procedures, managing inventory, problem solving, and measuring the health of the organization.

Prerequisite: BA 211.

**BA 301 - Research and Analysis of Business Problems (4)**

Development and use of business tools and techniques as applied to business problems. Students will identify business problems, articulate the issues, research, develop, and evaluate solution alternatives relevant to the problem, and present the results orally and in writing. Students will integrate and reinforce their skills in logical and analytical processing, critical thinking, and communication.

Prerequisite: BA 205, BA 213, Comm 220, Stat 244, Ec 202, & Wr 121 or the third term of FRINQ (UnSt 103, UnSt 109, UnSt 116, UnSt 119, UnSt 123, UnSt 126, UnSt 133, UnSt 136, UnSt 139, UnSt 183, UnSt 190).

**BA 302 - Organizational Behavior (4)**

Focuses on issues that are relevant to the three levels of organizational behavior (i.e., individual, group, and organizational). Key topics include: the nature and dynamics of teams, personal values and employee job attitudes, communication, conflict resolution, motivation, leadership, decision making, employee effectiveness, and the impact of organizational level issues such as policies, structure, design, and culture. Techniques used to facilitate learning may include role plays, cases, presentations, organizational simulations, teamwork, and/or term research papers.

Prerequisite: BA 301 or concurrent registration in BA 301.

**BA 303 - Business Finance (4)**

Development and study of a decision framework for financial management with special emphasis on small- and medium-sized businesses. Topics include analysis of financial health, planning for future financial performance, evaluation of investment opportunities, and analyses of risk. Financing of firm growth and valuation will be introduced. An integration of the concepts of financial management into a total system approach to business decision making will be facilitated with the use of cases, as appropriate.

Prerequisite: BA 213, Stat 244, Ec 202.

**BA 306 - Essentials of Finance for Non-Business Majors (4)**

Essential topics in accounting and finance for business minors and non-business majors. Reading and interpreting income statements and balance sheets, especially for small businesses. Forecasting to determine financing requirements. Use of techniques in time value of money to determine present values, loan payments, etc. Sources of business financing.

**BA 306U - Essentials of Finance for Non-Business Majors (4)**

Essential topics in accounting and finance for business minors and non-business majors. Reading and interpreting income statements and balance sheets, especially for small businesses. Forecasting to determine financing requirements. Use of techniques in time value of money to determine present values, loan payments, etc. Sources of business financing.

**BA 311 - Marketing Management (4)**

Basic marketing concepts from the perspective of the marketing manager. Key focus is to examine the marketing planning and analysis necessary to develop sound marketing plans and strategies. Specific topics include the role of marketing within the firm, analysis of marketing opportunities, selection of target markets and market segmentation, marketing strategies in a global marketplace, use of technology in marketing, and marketing mix decisions. Experiential learning approaches for class participation will be used.

Prerequisite: BA 301 or concurrent registration in BA 301.

**BA 316 - Essentials of Marketing for Non-Business Majors (4)**

Essential topics in marketing for business minors and non-business majors. Students will be introduced to the basic concepts of marketing and customer satisfaction. Students will explore primary considerations of the market environment and marketing practices including price, promotion, distribution, and product in an applied setting.

**BA 316U - Essentials of Marketing for Non-Business Majors (4)**

Essential topics in marketing for business minors and non-business majors. Students will be introduced to the basic concepts of marketing and customer satisfaction. Students will explore primary considerations of the market environment and marketing practices including price, promotion, distribution, and product in an applied setting.

**BA 325 - Competing with Information Technology (4)**

Presents the key steps required to gain a competitive advantage in the marketplace through the use of information technologies. Primary focus is to help students understand the information systems development lifecycle and the ways that systems can support functional areas of a business. Other topics include: communication technologies to support groups, productivity software and applications, designing systems for competitive advantage, and systems reengineering.

Prerequisite: BA 213, Stat 244, Ec 202.

**BA 326 - Essentials of Management for Non-Business Majors (4)**

Essential topics in management and business communications for business minors and non-business majors. Focuses on the management of business organizations in an applied setting. Key topics include motivating and leading individuals and groups, working effectively in teams, and conflict management. In addition, students will learn to collect, organize, and present information in a business setting.
BA 326U - Essentials of Management for Non-Business Majors (4)

Essential topics in management and business communications for business minors and non-business majors. Focuses on the management of business organizations in an applied setting. Key topics include motivating and leading individuals and groups, working effectively in teams, and conflict management. In addition, students will learn to collect, organize, and present information in a business setting.

BA 336 - Essentials of Information Technology for Non-Business Majors (4)

Discusses the importance of information and its support of a business organization. An understanding of the essential relationships among information, business process, and information technology. This is a survey course for business minors and non-business majors.

BA 336U - Essentials of Information Technology for Non-Business Majors (4)

Discusses the importance of information and its support of a business organization. An understanding of the essential relationships among information, business process, and information technology. This is a survey course for business minors and non-business majors.

BA 339 - Operations and Quality Management (4)

Develops an understanding of the various issues and strategies involved in the operation of a service or manufacturing organization. These considerations include the support by the operation’s organization of corporate strategy through design and operating decisions. Issues such as global supply sources, worldwide business system influences, continuous improvement, and total quality management will be discussed.

Prerequisite: BA 301 or concurrent registration in BA 301.

BA 346 - Essentials of Entrepreneurship for Non-Business Majors (4)

Capstone course in the business minor. Provides the student an opportunity to link previous coursework in the development of business plans and organizations, with specific emphasis on the challenges of small emerging organizations. Project-based course that provides students with a toolbox of applied skills.

BA 346U - Essentials of Entrepreneurship for Non-Business Majors (4)

Capstone course in the business minor. Provides the student an opportunity to link previous coursework in the development of business plans and organizations, with specific emphasis on the challenges of small emerging organizations. Project-based course that provides students with a toolbox of applied skills.

BA 385 - Business Environment (4)

Study and critical analysis of the role of business in its environment with special references to the interrelationships of legal, technological, economic, political, and social forces with the business enterprise and to the legal and ethical obligations of the business enterprise with its owners, employees, consumers, and society.

Prerequisite: BA 301.

BA 407 - Seminar (1-9)

(Credit to be arranged.) Seminars in selected cross-functional and integrative business topics.

BA 410 - Selected Topics (1-6)

(Credit to be arranged.)

BA 423 - Executive Perspectives on Leadership (1)

This course provides students the opportunity to interact and learn directly from executives at for-profit, not-for-profit and government organizations. Students will listen to and discuss the concepts and practices of leadership as it relates to the professional experiences of the executives.

BA 495 - Business Strategy (6)

Capstone course for the SBA; should be taken in the student's final term. This course meets University Studies' Capstone requirement. Students learn to systematically analyze a firm’s internal and external environments and, through engagement with community partners, apply concepts and theories related to the formulation and implementation of business/organization strategies. Students join an interdisciplinary team; pool their knowledge, skills, and interests; use strategy to address a problem or concern of the community partner. Emphasis on multiple functions and perspectives to understand diverse management and stakeholder interpretations, conceive integrative solutions, and address social and organizational outcomes.

Prerequisite: BA 301, 302, 311, 325, 339, and 385. Priority to graduating seniors who have applied for graduation.

BA 501 - Research (1-9)

(Credit to be arranged.)

BA 504 - Cooperative Education/Internship (1-12)

(Credit to be arranged.)

BA 505 - Reading & Conference (1-8)

(Credit to be arranged.)

BA 506 - Special Projects (2-6)

Credit to be arranged.

BA 507 - Seminar (1-9)

(Credit to be arranged.) Seminars in selected cross-functional and integrative business topics.

BA 508 - Workshop (2)

Credit to be arranged.

BA 509 - Practicum (1)

Credit to be arranged.

BA 521 - Leadership Development and Assessment (2)

This course is the first stage for the development of leadership competencies in the MBA+ program. Each student will be expected to write a personal development and learning plan based upon the results of an initial assessment of the student’s leadership strengths and weaknesses. During the term the students will be involved in various activities to assess and develop their interpersonal, communication, problem solving, and systems thinking competencies. Pass/no pass course, concurrent enrollment in Mktg 511 is required.

Corequisite: Mktg 511.

BA 522 - Communications for Leaders (1)

Focus on building effective communication skills, including writing, speaking and listening. Students will learn how to create and engage in clear and well-structured communications – both oral and written.
Students will be introduced specific techniques that students can use to increase their effectiveness as communicators, engage their audience and respond to ‘expected’ and ‘unexpected’ questions that arise in a way that is authentic, collaborative and influential.

**BA 523 - Executive Perspectives on Leadership (1)**
This course provides students the opportunity to interact and learn directly from executives at for-profit, not-for-profit and government organizations. Students will listen to and discuss the concepts and practices of leadership as it relates to the professional experiences of the executives.

**BA 524 - Leadership Immersion (1)**
A business simulation experience designed to assess students’ technical and leadership skills. This course can only be taken as a pass/no pass grading option.

Prerequisite: Fin 513.

**BA 525 - Capstone Consulting Project (2-6)**
Under the direction of a faculty member, students work in teams over two terms to apply MBA knowledge, skills and leadership competencies to an actual organizational problem in a consulting framework. This course requires two consecutive terms to complete. MBA

Prerequisite: Mgmt 511, Fin 513 and Mktg 512; and BA 524 (may be concurrent); and completion of at least 37 hours of the MBA core sequence. MSFA prerequisites: Mgmt 511, Fin 551 and Fin 553.

**BA 526 - MBA International Experience (4)**
The MBA International Experience provides the opportunity for students to study international business and intercultural topics and gain hands-on experience in a different country or in the Portland Metro region. Locations and course topics are determined based on the strategic priorities of the MBA program. International Experiences conducted in different countries require approximately two weeks overseas. International Experience conducted in the Portland Metro region will be offered in four to eight week formats.

Prerequisite: Students will need to have completed the first year of their MBA program in order to participate in the MBA International Experience.

**BA 548 - Special Topics in Business (1-6)**
The courses offered under this number cover a range of specialized topics in business such as Product Design and Stewardship for Global Corporations, Sustainability Metrics in Business, Cross-Sector Partnerships for Sustainable Enterprise, Global Marketing Research, Marketing in Asia, Global Marketing, Global Human Resource Management, etc. Open to graduate students of the School of Business Administration. May be repeated with different topics; maximum of 12 credits may be applied to the master’s degree.

**Bi - Biology**

**Bi 101 - General Biology (3)**
The fundamental principles of life as they apply to both plants and animals. If taken after completing courses with similar materials credit will be restricted. This is first course in a sequence of three: Bi 101, Bi 102, and Bi 103. Concurrent enrollment in Bi 104, Bi 105, Bi 106 required.

**Bi 102 - General Biology (3)**
The fundamental principles of life as they apply to both plants and animals. If taken after completing courses with similar materials credit will be restricted. This is second course in a sequence of three: Bi 101, Bi 102, and Bi 103. Concurrent enrollment in Bi 104, Bi 105, Bi 106 required.

**Bi 103 - General Biology (3)**
The fundamental principles of life as they apply to both plants and animals. If taken after completing courses with similar materials credit will be restricted. This is third course in a sequence of three: Bi 101, Bi 102, and Bi 103. Concurrent enrollment in Bi 104, Bi 105, Bi 106 required.

**Bi 104 - General Biology Labs (1)**
Laboratory to accompany General Biology (Bi 101, Bi 102, Bi 103). This is the first lab in a sequence of three: Bi 104, Bi 105, and Bi 106. Previous or concurrent enrollment in 101, 102, 103 is required. One 2-hour laboratory per week.

**Bi 105 - General Biology Labs (1)**
Laboratory to accompany General Biology (Bi 101, Bi 102, Bi 103). This is the third lab in a sequence of three: Bi 104, Bi 105, and Bi 106. Previous or concurrent enrollment in 101, 102, 103 is required. One 2-hour laboratory per week.

**Bi 161 - Food, Plants, and People (3)**
The role of plants in human affairs as sources of food, fiber, fuel, beverages, and drugs. This course does not satisfy the Department of Biology botany course requirement and is intended for nonmajors.

**Bi 163 - Organic Gardening (3)**
An in-depth study of the principles and practices of modern home gardening. Plants, soils, and climates are studied in relation to the production of vegetables, herbs, flowers, and perennial food plants. The organic and chemical approaches to gardening are discussed with the goal of helping students to formulate intelligently their own philosophy of gardening. Not intended for biology majors.

**Bi 175 - Evolutionary Concepts (3)**
This class is designed to provide background in evolutionary concepts for nonmajors and to address current issues in evolution as they are perceived and are being investigated by various members of our faculty in biology and geology. It is a combined lecture and discussion class and will include occasional guest lecturers presenting their research and views on various topics in evolution.

**Bi 199 - Special Studies (1-5)**
Please see department for course description. (Credit to be arranged.)

**Bi 201 - Fundamentals of Biology: Cells, Genes and Heredity (3)**
An overview of basic concepts of biology and applications to everyday life. Topics include the material basis of living systems; cell and molecular structures and interactions, and genetics and heredity, as applied to issues
such as cancer, nutrition, reproductive and genetic testing, and biotechnology. Fulfills the science requirement for non-majors. This course will not fulfill biology major requirements or pre-allied health requirements for introductory biology.

**Bi 202 - Fundamentals of Biology: Ecology, Conservation, and Health (3)**

A fundamental introduction to the biological concepts and principles underlying the relationships among ecology, conservation, sustainability, and public health. Topics include ecological principles, population ecology, and public health. These will translate into a better scientific understanding of ecology and health. Fulfills the science requirements for non-majors. This course will not fulfill biology major requirements or pre-allied health requirements for introductory biology.

**Bi 203 - Fundamentals of Biology: Evolution and Diversity of Life (3)**

An introduction to fundamental principles of evolution, origins, and diversity of life on Earth. Topics include history, development, mechanisms and processes of evolution, patterns of ancestry, diversity and extinction, and surveys of the major life forms including the origin and evolution of modern humans. Fulfills the science requirement for non-majors. This course will not fulfill biology major requirements or pre-allied health requirements for introductory biology.

**Bi 204 - Fundamentals of Biology Laboratory: Cells, Genes and Heredity (1)**

A laboratory course to accompany Bi 201 Fundamentals of Biology. Hands-on inquiry and investigations of topics relating to the material basis of living systems; cell and molecular structures and interactions, and genetics and heredity. Fulfills the university laboratory science requirement.

**Bi 205 - Fundamentals of Biology Laboratory: Ecology Conservation and Health (1)**


**Bi 206 - Fundamentals of Biology Lab: Evolution and Diversity of Life (1)**

A laboratory course to accompany Bi 203 Fundamentals of Biology. Hands-on inquiry and investigations of topics relating to the major groups of organisms. Fulfills the university laboratory science requirement.

**Bi 207 - Biology for Allied Health I (4)**

Three-term preparatory biology lecture and integrated lab course for students preparing for allied health career tracks. Bi 207: Cell, Molecular and Genetics: topics include cell structure and function, molecular basis of life, cellular basis of reproduction, heredity and genetics. Bi 208: Evolution and Diversity of Life: topics include origin and evolution of diversity of life from viruses and microbes to vertebrates; animal behavior, organismal interactions. Bi 209: Anatomy and Physiology Systems: topics include skeletal, circulatory, respiratory, digestive, urinary, endocrine, nervous, immunological, reproductive systems; organization, development, and homeostasis in animals. Integrated lab exercises emphasize the process of scientific inquiry using critical thinking and communication skills. This is the first course in a sequence of three: Bi 207, Bi 208, and Bi 209.

Corequisite: Bi 207L.

**Bi 207L - Biology for Allied Health Lab I (0)**

Biology for Allied Health Lab.

Corequisite: Bi 207.

**Bi 208 - Biology for Allied Health: Evolution and Diversity of Life (4)**

Three-term preparatory biology lecture and integrated lab course for students preparing for allied health career tracks. Bi 207: Cell, Molecular and Genetics: topics include cell structure and function, molecular basis of life, cellular basis of reproduction, heredity and genetics. Bi 208: Evolution and Diversity of Life: topics include origin and evolution of diversity of life from viruses and microbes to vertebrates; animal behavior, organismal interactions. Bi 209: Anatomy and Physiology Systems: topics include skeletal, circulatory, respiratory, digestive, urinary, endocrine, nervous, immunological, reproductive systems; organization, development, and homeostasis in animals. Integrated lab exercises emphasize the process of scientific inquiry using critical thinking and communication skills. This is the second course in a sequence of three: Bi 207, Bi 208, and Bi 209.

Corequisite: Bi 208L.

**Bi 208L - Biology for Allied Health Lab II (0)**

Biology for Allied Health Lab.

Corequisite: Bi 208.

**Bi 209 - Biology for Allied Health: Anatomy and Physiology Systems (4)**

Three-term preparatory biology lecture and integrated lab course for students preparing for allied health career tracks. Bi 207: Cell, Molecular and Genetics: topics include cell structure and function, molecular basis of life, cellular basis of reproduction, heredity and genetics. Bi 208: Evolution and Diversity of Life: topics include origin and evolution of diversity of life from viruses and microbes to vertebrates; animal behavior, organismal interactions. Bi 209: Anatomy and Physiology Systems: topics include skeletal, circulatory, respiratory, digestive, urinary, endocrine, nervous, immunological, reproductive systems; organization, development, and homeostasis in animals. Integrated lab exercises emphasize the process of scientific inquiry using critical thinking and communication skills. This is the third course in a sequence of three: Bi 207, Bi 208, and Bi 209.

Corequisite: Bi 209L.

**Bi 209L - Biology for Allied Health Lab III (0)**

Biology for Allied Health Lab.

Corequisite: Bi 209.

**Bi 211 - Principles of Biology I (4)**

Study of the basic principles of living organisms. The course will study both plants and animals and topics will include cell structure, energy production synthesis, nutrition, genetics, evolution, classification, excretion mechanisms of response, reproduction and development, and ecology. Four hours lecture. This is the first course in a sequence of three: Bi 211, Bi 212, Bi 213 and must be taken in sequence. Expected preparation: Completion of Ch 221 and Ch 227, or concurrent enrollment in Ch 221 and Ch 227. Co-requisite: Bi 214.

Corequisite: Bi 214.
Bi 212 - Principles of Biology II (4)
Study of the basic principles of living organisms. The course will study both plants and animals and topics will include cell structure, energy production synthesis, nutrition, genetics, evolution, classification, excretion mechanisms of response, reproduction and development, and ecology. Four hours lecture. This is the second course in a sequence of three: Bi 211, Bi 212, Bi 213 and must be taken in sequence. Corequisite: Bi 215.
Prerequisite: Completion of Bi 211 with a C- or above. Corequisite: Bi 215.

Bi 213 - Principles of Biology III (4)
Study of the basic principles of living organisms. The course will study both plants and animals and topics will include cell structure, energy production synthesis, nutrition, genetics, evolution, classification, excretion mechanisms of response, reproduction and development, and ecology. Four hours lecture. This is the third course in a sequence of three: Bi 211, Bi 212, Bi 213 and must be taken in sequence. Corequisite: Bi 216.
Prerequisite: Completion of Bi 212 with a C- or above. Corequisite: Bi 216.

Bi 214 - Principles of Biology Lab I (1)
Laboratory work to accompany Principles of Biology I (Bi 211). Completion of, or concurrent enrollment in the appropriate lecture course is required. One 3-hour laboratory. Graded only.
Corequisite: Bi 211.

Bi 215 - Principles of Biology Lab II (1)
Laboratory work to accompany Principles of Biology II (Bi 212). Completion of, or concurrent enrollment in the appropriate lecture course is required. One 3-hour laboratory. Graded only.
Corequisite: Bi 212.

Bi 216 - Principles of Biology Lab III (1)
Laboratory work to accompany Principles of Biology III (Bi 213). Completion of, or concurrent enrollment in the appropriate lecture course is required. One 3-hour laboratory. Graded only.
Corequisite: Bi 213.

Bi 234 - Elementary Microbiology (4)
Introduction to the basic and applied aspects of microbiology, with special emphasis on the role of microorganisms in human affairs. Such fields as nursing, environmental protection, food technology, and public health are given special attention. Topics will include microbial growth and death, human disease, environmental microbiology, food and industrial microbiology, microbial aspects of water and sewage treatment, aspects of microbial gene flow, genetic engineering, and vaccine development.

Bi 235 - Microbiology Laboratory (2)
The laboratory is designed for science majors and others who need practical experience in culturing and observation of microorganisms. Topics will include culture techniques, use of the microscope for observation of microorganisms, and procedures for study of microorganisms in the laboratory and field. Two 2-hour laboratory periods.

Bi 299 - Special Studies (1-8)
See department for course description. (Credit to be arranged.)

Bi 301 - Human Anatomy and Physiology (4)
Microanatomy, macroanatomy, genetics, embryology, and physiology. Comprehensive understanding of man as a functionally integrated biological entity. One 3-hour laboratory. This is the first course in a sequence of three: Bi 301, Bi 302, and Bi 303. Expected preparation: One year of college biological science; for Bi 302: Completion of Bi 301 with C- or above; for Bi 303: Completion of Bi 302 with a C- or above.
Corequisite: Bi 301L.

Bi 301L - Human Anatomy and Physiology Lab (0)
Lab for Bi 301.
Corequisite: Bi 301.

Bi 302 - Human Anatomy and Physiology (4)
Microanatomy, macroanatomy, genetics, embryology, and physiology. Comprehensive understanding of man as a functionally integrated biological entity. One 3-hour laboratory. This is the second course in a sequence of three: Bi 301, Bi 302, and Bi 303. Expected preparation: One year of college biological science; for Bi 302: Completion of Bi 301 with C- or above; for Bi 303: Completion of Bi 302 with a C- or above.
Corequisite: Bi 302L.

Bi 303 - Human Anatomy and Physiology (4)
Microanatomy, macroanatomy, genetics, embryology, and physiology. Comprehensive understanding of man as a functionally integrated biological entity. One 3-hour laboratory. This is the third course in a sequence of three: Bi 301, Bi 302, and Bi 303. Expected preparation: One year of college biological science; for Bi 302: Completion of Bi 301 with C- or above; for Bi 303: Completion of Bi 302 with a C- or above.
Corequisite: Bi 303L.

Bi 303L - Human Anatomy and Physiology Lab (0)
Lab for Bi 303.
Corequisite: Bi 303.

Bi 320 - Introduction to Organismal Physiology (4)
An overview of fundamental principles of physiology. Course covers the physical and chemical mechanisms responsible for how plants and animals function.
Prerequisite: Bi 211, Bi 212.

Bi 326 - Comparative Vertebrate Embryology (5)
Comparative study of the development of representative vertebrates, including the cellular mechanisms responsible for early morphogenesis. One 4-hour laboratory period.
Prerequisite: Completion of Bi 211, Bi 212, and Bi 213 with C- or above in each section. Corequisite: Bi 326L.

Bi 326L - Vertebrate Embryology Lab (0)
Lab for Bi 326.
Corequisite: Bi 326.
Bi 328 - Comparative Vertebrate Anatomy (5)
Gross dissection and comparison of organ systems in representative vertebrate forms. Two 4-hour laboratory periods.
Prerequisite: Completion of Bi 252 with a C- or above. Corequisite: Bi 328L.

Bi 328L - Comparative Vertebrate Anatomy Lab (0-1)
Lab for Bi 328.
Corequisite: Bi 328.

Bi 330 - Introduction to Plant Biology (4)
Plant diversity, structure and function in relationship to evolution, habitat, and interactions with other organisms. Historical impacts of plants on human culture, including conservation, biotechnology, and world food supply.
Prerequisite: Completion of Bi 211, Bi 212, and Bi 213 with C- or above in each section.

Bi 334 - Molecular Biology (4)
The principles, concepts and methods of molecular biology focusing on structure, biochemistry, biosynthesis, and regulation of cellular macromolecules-DNA, RNA, and proteins. Topics covered include the nature, structure, regulation and expression of genes, molecular aspects and regulation of translation, DNA replication and repair, mutagenesis, and an introduction to molecular techniques.
Prerequisite: Completion of Bi 211 with a C- or above.

Bi 336 - Cell Biology (5)
An introduction to the biology of eukaryotic (plant/animal) and prokaryotic cells (bacteria, etc.) with emphasis on physiology, biochemistry, morphology, and energetics. Four hours of lecture and one hour of recitation. Recommended prerequisites: one year of introductory biology and one year of introductory chemistry.
Prerequisite: Completion of Bi 334 with a C- or above or permission of instructor. Corequisite: Bi 336R.

Bi 336R - Cell Biology Recitation (0)
Recitation for Bi 336.
Corequisite: Bi 336.

Bi 337 - Cell Biology Laboratory (2)
Experiments in cell biology to complement lecture. One three-hour laboratory. Recommended prerequisite: prior completion of/or concurrent enrollment in Bi 336.

Bi 341 - Introduction to Genetics (4)
The mechanism of biological inheritance. One 2-hour recitation period.
Prerequisite: Completion of Bi 211 with a C- or above. Corequisite: Bi 341R.

Bi 341R - Introduction to Genetics Recitation (0)
Recitation for Bi 341.
Corequisite: Bi 341.

Bi 346 - Genes and Society (4)
Explores the principles of genetics, molecular biology, and biotechnology within social and historical context. Emphasis on the ethical issues arising from the intersection of genetics, technology, and society, with attention to the role of gender, race, and class in the formation and application of scientific knowledge. This is the same course as WS 346 and may be taken only once for credit.
Crosslisted as: WS 346.

Bi 346U - Genes and Society (4)
Explores the principles of genetics, molecular biology, and biotechnology within social and historical context. Emphasis on the ethical issues arising from the intersection of genetics, technology, and society, with attention to the role of gender, race, and class in the formation and application of scientific knowledge. This is the same course as WS 346 and may be taken only once for credit.
Crosslisted as: WS 346U.

Bi 357 - General Ecology (4)
The interrelationships of plants and animals with their environments. Emphasis is on basic ecological principles and concepts, not on current environmental problems.
Prerequisite: Bi 211, Bi 212, Bi 213 with a C- or above in each section.

Bi 358 - Evolution (4)
Examination of processes underlying evolutionary change and patterns of biodiversity generated by these processes. Introduction to elementary population genetics, quantitative genetics, and phylogenetics. Emphasizes methods of reasoning and experimentation used in evolutionary research. Expected preparation: Bi 341.
Prerequisite: Completion of Bi 211, Bi 212, Bi 213 with a C- or above.

Bi 360 - Introduction to Marine Biology (3)
The marine environment and its life forms. Survey of organismal diversity with emphasis on structural and physiological adaptations to the marine realm.
Prerequisite: Completion of Bi 251, Bi 252, Bi 253 with a C- or above in each section.

Bi 361 - Introduction to Marine Biology Laboratory (1)
Laboratory and field work in marine biology. One 3-hour laboratory period. Recommended prerequisite: completion of/or concurrent enrollment in Bi 360.

Bi 370 - Mushrooms (4)
An introduction to the distribution, systematics, identification, ecology, morphology, and life histories of visible fungi (mushrooms). Two 3-hour laboratory periods; field trips. Recommended prerequisite: one year of biology.
Corequisite: Bi 370L.

Bi 370L - Mushrooms Lab (0)
Lab for Bi 370 Mushrooms.
Corequisite: Bi 370.

Bi 372 - Nanotechnology, Society and Sustainability (4)
Introduction to ethical, legal, and social issues associated with nanotechnology. Critically evaluates implications and applications of nanotechnology to environmental and human health concerns, in local and global contexts. Addresses nanotechnology’s impact on the economic, environmental, and social aspects of sustainability. This is the same course as Sci 372U and may be taken only once for credit.
Crosslisted as: Sci 372.
Bi 372U - Nanotechnology, Society and Sustainability (4)

Introduction to ethical, legal, and social issues associated with nanotechnology. Critically evaluates implications and applications of nanotechnology to environmental and human health concerns, in local and global contexts. Addresses nanotechnology's impact on the economic, environmental, and social aspects of sustainability. This is the same course as Sci 372U and may be taken only once for credit. Crosslisted as: Sci 372U.

Bi 380 - Microbiology (4)

Fundamental concepts and techniques of microbiology. The general principles of microbial cell structure and function, physiology and biochemistry, growth, survival, classification, and diversity are emphasized. Prerequisite: Bi 334.

Bi 386 - Invertebrate Zoology (6)

Invertebrate animal diversity, with a focus on species of the Pacific Northwest. Emphasis on evolution of adaptations in anatomy, physiology, and behavior. Two 2-hour lectures, one 3-hour laboratory, with some field trips outside of class time. Prerequisite: Completion of Bi 211, Bi 212, Bi 213 with a C- or above. Corequisite: Bi 386L.

Bi 386L - Invertebrate Zoology Lab (0)

Lab for Bi 386. Corequisite: Bi 386.

Bi 387 - Vertebrate Zoology (6)

Classification, anatomical characteristics, distribution, and life habits of fishes, amphibians, reptiles, birds, and mammals. Two 2-hour lectures, one 3-hour laboratory. Prerequisite: Completion of Bi 211, Bi 212, Bi 213 with a C- or above in each section. Corequisite: Bi 387L.

Bi 387L - Vertebrate Zoology Lab (0)

Lab for Bi 387.

Bi 388 - Microbiology Techniques (2)

Techniques in microbiology, including staining and microscopy, isolation and maintenance of bacteria, counting techniques, and methods for a wide range of physiological and morphological tests. Prerequisite: Bi 235, or Bi 337, or consent of instructor.

Bi 399 - Special Studies (0-6)

See department for course description. (Credit to be arranged.)

Bi 401 - Research (0-6)

See department for course description. (Credit to be arranged.)

Bi 402 - Independent Study (1-6)

(Credit to be arranged.)

Bi 403 - Thesis (1-6)

(Credit to be arranged.)

Bi 404 - Cooperative Education/Internship (1-12)

See department for course description. (Credit to be arranged.)

Bi 405 - Reading and Conference (0-6)

See department for course description. (Credit to be arranged.)

Bi 406 - Laboratory Project (1-6)

See department for course description. (Credit to be arranged.)

Bi 407 - Seminar (1-6)

Selected topics in biology. (Credit to be arranged.)

Bi 410 - Selected Topics (0-12)

Consent of instructor. See department for course description. (Credit to be arranged.)

Bi 410L - Selected Topics Lab (0)

Consent of instructor. See department for course description. (Credit to be arranged.)

Bi 412 - Animal Behavior (4)

An evolutionary approach to the study of animal behavior. The importance of ecological, physiological, and social variables will be examined in relation to the behavior of the individual animal. Also offered for graduate-level credit as Bi 512 and may be taken only once for credit. Expected preparation: upper-division standing. Prerequisite: Completion of Bi 211, Bi 212, Bi 213 with a C- or above in each section.

Bi 413 - Herpetology (6)

Distinguishing features, anatomy, physiology, origins, evolution, and ecology of amphibians and reptiles. North American species are emphasized. Two 2-hour lectures, two 2-hour laboratories. Prerequisite: Completion of Bi 211, Bi 212, Bi 213 with a C- or above in each section. Corequisite: Bi 413L.

Bi 413L - Herpetology Lab (0)

Lab for Bi 413 Herpetology. Corequisite: Bi 413.

Bi 414 - Ornithology (6)

Evolution, diversity, ecology, physiology, and behavior of birds. One 3-hour laboratory. Laboratory emphasizes species identification and exposes students to techniques used in museum and field studies. Students conduct a research project outside of scheduled laboratory time. Prerequisite: Completion of Bi 211, Bi 212, Bi 213 with a C- or above. Corequisite: Bi 414L.

Bi 414L - Ornithology Lab (0)

Lab for Bi 414 Ornithology. Corequisite: Bi 414.

Bi 415 - Mammalogy (6)

Diversity, characteristics, evolution, structure, function, distribution, and life habits of mammals. North American species are emphasized. Two 2-hour lectures, two 2-hour laboratories. Prerequisite: Completion of Bi 211, Bi 212, Bi 213 with a C- or above in each section. Corequisite: Bi 415L.

Bi 415L - Mammal Lab (0)

Lab for Bi 415 Mammalogy. Corequisite: Bi 415.

Bi 416 - Marine Mammals (6)

Study of the distinguishing features, classification, origins, evolution, physiology, anatomy, behavior, ecology, and status of groups of marine mammals. Two 2-hour lectures, one 3-hour laboratory. Also offered for graduate-level credit as Bi 516 and may be taken only once for credit. Prerequisite: Bi 387 or Bi 415. Corequisite: Bi 416L.

Bi 416L - Marine Mammal Lab (0)

Lab for Bi 416 Marine Mammals.
Corequisite: Bi 416.

**Bi 417 - Mammalian Physiology (4)**

Physiology of the mammalian cardiovascular, respiratory, renal and digestive systems with emphasis on homeostatic control and integration of these systems in normal and pathophysiological states. Also offered for graduate-level credit as Bi 517 and may be taken only once for credit.

Prerequisite: Completion of Bi 211, Bi 212, Bi 213 with a C- or above in each section.

**Bi 418 - Comparative Animal Physiology (4)**

Physiology of metabolic, respiratory, circulatory, excretory, muscle, and nervous systems with emphasis on a comparative ecological approach. Also offered for graduate-level credit as Bi 518 and may be taken only once for credit.

Prerequisite: Completion of Bi 211, Bi 212, Bi 213 with a C- or above in each section.

**Bi 419 - Animal Physiology Laboratory (4)**

Laboratory experiments on the physiology of animals from the cell through organismic levels. Two 3.5-hour laboratory periods. Also offered for graduate-level credit as Bi 519 and may be taken only once for credit.

Prerequisite: Completion of Bi 211, Bi 212, Bi 213 with a C- or above in each section.

**Bi 421 - Virology (4)**

Classification, structure, genetics, molecular biology of replication, cell interactions, and host response of representative groups of bacterial, plant, and animal viruses, and the medical aspects of important human viruses. Also offered for graduate-level credit as Bi 521 and may be taken only once for credit.

Expected preparation: Bi 336.

Prerequisite: Bi 334 with a C- or above.

**Bi 423 - Microbial Ecology (4)**

Study of the interaction of microorganisms with each other and plants and animals; soil and aquatic systems; microbial evolution; cycles of matter; biodegradation and microbial pest control. Also offered for graduate-level credit as Bi 523 and may be taken only once for credit.

Prerequisite: Bi 480.

**Bi 424 - Molecular Genetics (4)**

The nature of the gene and its mode of action, organization of the genetic material, and the regulation of gene action. Also offered for graduate-level credit as Bi 524 and may be taken only once for credit.

Prerequisite: Bi 334.

**Bi 425 - Natural History of Antarctica (5)**

Evolution and systematics of the Antarctic and sub-Antarctic flora and fauna, physiological adaptation to an extreme environment, conservation concerns and the history of exploration and exploitation of the Antarctic region. Also offered for graduate-level credit as Bi 525 and may be taken only once for credit.

Prerequisite: Completion of Bi 211, Bi 212, Bi 213 with a C- or above. Corequisite: Bi 425L.

**Bi 425L - Natural History of Antarctica Lab (0)**

Lab for Bi 425.

Corequisite: Bi 425.

**Bi 427 - Evolutionary Genetics (4)**

An introduction to population genetics theory and an examination of the genetic techniques that are used to look at populations, speciation, and phylogenetic relationships. Also offered for graduate-level credit as Bi 527 and may be taken only once for credit.

Prerequisite: Bi 341 and Bi 358.

**Bi 428 - Human Genetics (4)**

The organization of the human genome, pedigree analysis, gene mapping, chromosome abnormalities, sex determination, and gene defects (metabolic and hemoglobin). Topics are discussed from the point of view of clinical applications and current research. Also offered for graduate-level credit as Bi 528 and may be taken only once for credit.

Prerequisite: Bi 341.

**Bi 429 - Conservation Biology (4)**

Examination of the principles of conservation biology and applications of theory to conservation issues, globally and in the Northwest. Also offered for graduate-level credit as Bi 529 and may be taken only once for credit. Expected preparation: Bi 341, Bi 357, Bi 387, Bi 426.

**Bi 430 - Theory of Recombinant DNA Techniques (4)**

Lectures on the principles and theory of recombinant DNA and molecular cloning techniques. Topics will cover use of restriction and other DNA modifying enzymes, host-vector systems, DNA fragment and plasmid isolation techniques, gene mapping, subcloning techniques, in vitro mutagenesis, cDNA and genomic cloning, screening of clones, blot hybridizations, DNA transfection and use of reporter genes, DNA sequencing and PCR. Also offered for graduate-level credit as Bi 530 and may be taken only once for credit.

Prerequisite: Bi 334.

**Bi 431 - Recombinant DNA Techniques Laboratory (2)**

Laboratory of recombinant DNA and molecular cloning techniques. Co-requisite: Bi 430/530. Also offered for graduate-level credit as Bi 531 and may be taken only once for credit.

Prerequisite: Bi 235 or Bi 337. Corequisite: Bi 430.

**Bi 432 - Plant Diversity and Evolution (5)**

Study of the morphology, structure, and life history of green algae, bryophytes, and vascular plants from an evolutionary point of view. Two 2-hour lectures and one 3-hour laboratory. Also offered for graduate-level credit as Bi 532 and may be taken only once for credit.

Prerequisite: Bi 341 and Bi 358. Corequisite: Bi 432L.

**Bi 432L - Lab for Bi 432 (0)**

Lab for Bi 432.

**Bi 430 - Theory of Recombinant DNA Techniques (4)**

Lectures on the principles and theory of recombinant DNA and molecular cloning techniques. Topics will cover use of restriction and other DNA modifying enzymes, host-vector systems, DNA fragment and plasmid isolation techniques, gene mapping, subcloning techniques, in vitro mutagenesis, cDNA and genomic cloning, screening of clones, blot hybridizations, DNA transfection and use of reporter genes, DNA sequencing and PCR. Also offered for graduate-level credit as Bi 530 and may be taken only once for credit.

Prerequisite: Bi 334.

**Bi 432 - Plant Diversity and Evolution (5)**

Study of the morphology, structure, and life history of green algae, bryophytes, and vascular plants from an evolutionary point of view. Two 2-hour lectures and one 3-hour laboratory. Also offered for graduate-level credit as Bi 532 and may be taken only once for credit.

Prerequisite: Bi 341 and Bi 358. Corequisite: Bi 432L.

**Bi 432L - Lab for Bi 432 (0)**

Lab for Bi 432.

Corequisite: Bi 432.

**Bi 433 - Morphology of Vascular Plants (4)**

Study of the gross morphology, development, and structure of roots, stems, leaves, and flowers from an evolutionary point of view. One 3-hour laboratory. Also offered for graduate-level credit as Bi 533 and may be taken only once for credit.

Prerequisite: Completion of Bi 211, Bi 212, Bi 213 with a C- or above in each section.
Bi 434 - Plant Anatomy (5)
Structure of meristems, cells, tissues, and tissue systems or roots, stems, leaves, flowers and fruits from the developmental and comparative standpoint. One 3-hour laboratory. Also offered for graduate-level credit as Bi 534 and may be taken only once for credit.
Prerequisite: Completion of Bi 251, Bi 252, Bi 253 with a C- or above.

Bi 435 - Plant Systematics (4)
Angiosperm classification, diversity, and evolutionary relationships. Methods of phylogenetic analysis and current hypotheses regarding angiosperm phylogeny are emphasized. Lab will focus on the form and floral structure of about 30 local plant families. One 3-hour laboratory. Also offered for graduate-level credit as Bi 535 and may be taken only once for credit.
Prerequisite: Completion of Bi 251, 252, 253 with a C- or above. Corequisite: Bi 435L.

Bi 435L - Plant Systematics Lab (0)
Lab for Bi 435.
Corequisite: Bi 435.

Bi 436 - Behavioral Endocrinology (4)
Comparative examination of the major hormone systems that regulate behavior across the animal kingdom. Emphasizes the reciprocating nature of hormone and behavior interactions and seeks to understand how natural selection drives the evolution of hormone structure and function. Also offered for graduate-level credit as Bi 536 and may be taken only once for credit.
Prerequisite: Completion of Bi 211, Bi 212, Bi 213 with a C- or above.

Bi 441 - Plant Physiology (5)
Metabolic activities of plants. Two 3-hour laboratory periods. Also offered for graduate-level credit as Bi 541 and may be taken only once for credit.
Prerequisite: Completion of Bi 211, Bi 212, Bi 213 with a C- or above in each section.
Corequisite: Bi 441L.

Bi 441L - Plant Physiology Lab (0)
Lab for Bi 441.
Corequisite: Bi 441.

Bi 442 - Plant Physiology (3)
Biochemical activities of plants, photosynthesis, and respiration. Course is intended to be taken in sequence with Bi 441. Also offered for graduate-level credit as Bi 542 and may be taken only once for credit. Expected preparation: Bi 441.

Bi 450 - Phylogenetic Biology (4)
The history of life's diversification through the use of phylogenetic trees, with a focus on how genes, organisms, and traits have evolved. Includes hands-on computer analyses of DNA sequences. Also offered for graduate-level credit as Bi 550 and may be taken only once for credit.
Prerequisite: Bi 358 with a C- or above, or concurrent enrollment in Bi 358.

Bi 453 - Biology of Aging (3)
The study of molecular and structural changes in animals as a function of age. Emphasis is on the basic biological factors which limit life-span. Recommended prerequisites: Bi 336 or biochemistry, Bi 487.

Bi 455 - Histology (6)
Systemic study, description, and identification of histological structures. Two 3-hour laboratory periods. Also offered for graduate-level credit as Bi 555 and may be taken only once for credit.
Prerequisite: Completion of Bi 251, Bi 252, and Bi 253 with a C- or above and Bi 320 or Bi 336 with a C- or above. Corequisite: Bi 455L.

Bi 455L - Histology Lab (0)
Lab for Bi 455.
Corequisite: Bi 455.

Bi 456 - Developmental Biology (4)
Explores basic principles of how organisms develop from a fertilized egg into a complex, multicellular adult. Focuses on contemporary issues in developmental biology, including pattern formation, morphogenesis, determination, and differentiation in vertebrates and invertebrates. Also offered for graduate-level credit as Bi 556 and may be taken only once for credit.
Prerequisite: Bi 336 and Bi 341.

Bi 462 - Neurophysiology (4)
Anatomy of the vertebrate central nervous system (CNS). Topics include: Chemical and electrical signaling between cells in the CNS, pharmacological intervention, visual and somatosensory systems, learning, memory, and simple motor pattern generators. Also offered for graduate-level credit as Bi 562 and may be taken only once for credit.
Expected preparation: Bi 336 and Ph 203.
Prerequisite: Completion of Bi 211, Bi 212, Bi 213 with a C- or above in each section.

Bi 463 - Sensory Physiology (4)
Exploration of the range of animal senses including the principles of sensation and sensory communication in general, and the detailed physiology of transduction for mechanical, electromagnetic, chemical, nociceptive, and thermal senses. Also offered for graduate-level credit as Bi 563 and may be taken only once for credit.
Expected preparation: Bi 462 and Ph 203.
Prerequisite: Completion of Bi 211, Bi 212, Bi 213 with a C- or above in each section.

Bi 471 - Plant Ecology (4)
A study of the interrelationships between plants and their environment with emphasis upon individual adaptation and community dynamics. One 3-hour laboratory period. Also offered for graduate-level credit as Bi 571 and may be taken only once for credit.
Prerequisite: Bi 357. Corequisite: Bi 471L.

Bi 471L - Plant Ecology Lab (0)
Lab for Bi 471.
Corequisite: Bi 471.

Bi 472 - Natural History (3)
A study of plant and animal interrelationships, emphasizing maintenance of proper field records, identification, distribution, and ecology of vertebrates in Oregon. Includes one two-hour laboratory. Also offered for graduate-level credit as Bi 572 and may be taken only once for credit.
Prerequisite: Completion of Bi 211, Bi 212, Bi 213 with a C- or above in each section.
Corequisite: Bi 472L.

Bi 472L - Lab for Bi 472 (0)
Lab for Bi 472.
Corequisite: Bi 472.
Bi 473 - Field Sampling (4)
The methods commonly employed for collecting and interpreting ecological data. One 3-hour laboratory. Also offered for graduate-level credit as Bi 573 and may be taken only once for credit.
Prerequisite: Completion of Bi 211, Bi 212, Bi 213 with a C- or above in each section.

Bi 476 - Population Ecology (5)
Course is designed to explore methods to describe population growth and dynamics of plants and animals. The theoretical foundation for the evolution of life histories will be explored, along with analysis of the influence of interspecific interactions on population processes. Larger landscape-level questions will be addressed by examining populations from the framework of source-sink dynamics, ecological traps, and metapopulations. Also offered for graduate-level credit as Bi 576 and may be taken only once for credit.
Prerequisite: Bi 357.

Bi 476L - Population Ecology Lab (0)
Lab for Bi 476.

Bi 481 - Microbial Physiology (3)
Physiology and biochemistry of microorganisms. Modern contributions to microbiology emphasized. Micro- and macro-molecular anatomy of microbial cells; energy metabolism, biosynthetic pathways and their regulation, kinetic and molecular aspects of growth, genetics, evolution, and ecology. Also offered for graduate-level credit as Bi 581 and may be taken only once for credit.
Prerequisite: Completion of Bi 211, Bi 212, Bi 213 with a C- or above in each section.

Bi 486 - Pathogenic Bacteriology (4)
Study of bacteria pathogenic to humans and their relationship to infectious disease. Emphasis on the biochemical mechanism of infection and laboratory diagnosis. Also offered for graduate-level credit as Bi 586 and may be taken only once for credit.
Prerequisite: Bi 480.

Bi 487 - Immunology and Serology (4)
Topics include the tissues and cells of the immune system, discrimination between self versus foreign antigen, the structure, function and genetics of antigen receptors, components and coordination between innate and adaptive responses, and disease response and susceptibility. Also offered for graduate-level credit as Bi 587 and may be taken only once for credit.
Prerequisite: Completion of Bi 334 and Bi 336 with a C- or above.

Bi 489 - Microbiology Physiology Laboratory (1)
Application of the principles of microbiology in the laboratory. One 3-hour laboratory period. Also offered for graduate-level credit as Bi 589 and may be taken only once for credit. Expected preparation: concurrent with Bi 481/581.

Bi 501 - Research (0-12)
See department for course description. (Credit to be arranged.)

Bi 502 - Independent Study (1-6)
(Credit to be arranged.)

Bi 503 - Thesis (0-12)
See department for course description. (Credit to be arranged.)

Bi 504 - Cooperative Education/internship (1-9)
See department for course description. (Credit to be arranged.)

Bi 505 - Reading and Conference (0-12)
See department for course description. (Credit to be arranged.)

Bi 506 - Specil Projects (1-8)
See department for course description. (Credit to be arranged.)

Bi 507 - Seminar (1-6)
Selected topics in biology. (Credit to be arranged.)

Bi 509 - Practicum (1-9)
(Credit to be arranged.)

Bi 510 - Selected Topics (0-6)
Consent of instructor. See department for course description. (Credit to be arranged.)

Bi 512 - Animal Behavior (4)
An evolutionary approach to the study of animal behavior. The importance of ecological, physiological, and social variables will be examined in relation to the behavior of the individual animal. Also offered for undergraduate-level credit as Bi 412 and may be taken only once for credit. Expected preparation: one year of introductory biology and upper-division standing.

Bi 513 - Herpetology (6)
Distinguishing features, anatomy, physiology, origins, evolution, and ecology of amphibians and reptiles. North American species are emphasized. Two 2-hour lectures, two 2-hour laboratories.

Bi 514 - Ornithology (6)
Evolution, diversity, ecology, physiology, and behavior of birds. One 3-hour laboratory. Laboratory emphasizes species identification and exposes students to techniques used in museum and field studies. Students conduct a research project outside of scheduled laboratory time.
Corequisite: Bi 514L.

Bi 514L - Ornithology Lab (0)
Lab for Bi 514.

Bi 515 - Mammalogy (6)
Diversity, characteristics, evolution, structure, function, distribution, and life habits of mammals. North American species are emphasized. Two 2-hour lectures, two 2-hour laboratories.
Corequisite: Bi 515L.

Bi 515L - Mammal Lab (0)
Lab for Bi 515.
Corequisite: Bi 515.

Bi 516 - Marine Mammals (6)
Study of the distinguishing features, classification, origins, evolution, physiology, anatomy, behavior, ecology, and status of groups of marine mammals. Two 2-hour lectures, one 3-hour laboratory. Also offered for undergraduate-level credit as Bi 416 and may be taken only once for credit.
Prerequisite: Bi 387 or Bi 415. Corequisite: Bi 516L.
Bi 516L - Marine Mammal Lab (0)
Lab for Bi 516.
Corequisite: Bi 516.

Bi 517 - Mammalian Physiology (4)
Physiology of the mammalian cardiovascular, respiratory, renal and digestive systems with emphasis on homeostatic control and integration of these systems in normal and pathophysiological states. Also offered for undergraduate-level credit as Bi 417 and may be taken only once for credit.

Bi 518 - Comparative Animal Physiology (4)
Physiology of metabolic, respiratory, circulatory, excretory, muscle, and nervous systems with emphasis on a comparative ecological approach. Also offered for undergraduate-level credit as Bi 418 and may be taken only once for credit.

Bi 519 - Animal Physiology Laboratory (4)
Laboratory experiments on the physiology of animals from the cell through organismic levels. Two 3.5-hour laboratory periods. Also offered for undergraduate-level credit as Bi 419 and may be taken only once for credit.

Bi 520 - Ethical Practice in the Life Sciences (3)
Addresses issues pertaining to the ethical and responsible conduct of scientific research, including role of research in society; biosafety; human and animal subjects and welfare; funding, conflict of interest, and intellectual property; publication and peer review; and fraud, bias and misconduct. Satisfies NSF and NIH requirements for research ethics training. Open to graduate students in Biology, Chemistry, and Environmental Sciences. Post-bac students not currently enrolled in a graduate program may take this course with departmental approval.

Bi 521 - Virology (4)
Classification, structure, genetics, molecular biology of replication, cell interactions, and host response of representative groups of bacterial, plant, and animal viruses, and the medical aspects of important human viruses. Also offered for undergraduate-level credit as Bi 421 and may be taken only once for credit.

Bi 522 - Microbial Ecology (4)
Study of the interaction of microorganisms with each other and plants and animals; soil and aquatic systems; microbial evolution; cycles of matter; biodegradation and microbial pest control. Also offered for undergraduate-level credit as Bi 423 and may be taken only once for credit.
Prerequisite: Bi 480.

Bi 524 - Molecular Genetics (4)
The nature of the gene and its mode of action, organization of the genetic material, and the regulation of gene action. Also offered for undergraduate-level credit as Bi 424 and may be taken only once for credit.

Bi 525 - Natural History of Antarctica (5)
Evolution and systematics of the Antarctic and sub-Antarctic flora and fauna, physiological adaptation to an extreme environment, conservation concerns and the history of exploration and exploitation of the Antarctic region. Also offered for undergraduate-level credit as Bi 425 and may be taken only once for credit.
Corequisite: Bi 525L.

Bi 525L - Natural History of Antarctica Lab (0)
Lab for Bi 525.
Corequisite: Bi 525.

Bi 526 - Principles of Evolution (4)
Lectures and discussions on advanced topics in evolutionary biology; evaluation of historical and current trends in this field. Recommended prerequisite: Bi 358 or equivalent.

Bi 527 - Evolutionary Genetics (4)
An introduction to population genetics theory and an examination of the genetic techniques that are used to look at populations, speciation, and phylogenetic relationships. Also offered for undergraduate-level credit as Bi 427 and may be taken only once for credit.
Prerequisite: Bi 341 and Bi 358.

Bi 528 - Human Genetics (4)
The organization of the human genome, pedigree analysis, gene mapping, chromosome abnormalities, sex determination, and gene defects (metabolic and hemoglobin). Topics are discussed from the point of view of clinical applications and current research. Also offered for undergraduate-level credit as Bi 428 and may be taken only once for credit.
Prerequisite: Bi 341.

Bi 529 - Conservation Biology (4)
Examination of the principles of conservation biology and applications of theory to conservation issues, globally and in the Northwest. Also offered for undergraduate-level credit as Bi 429 and may be taken only once for credit. Expected preparation: Bi 341, Bi 357, Bi 387, Bi 426.

Bi 530 - Theory of Recombinant DNA Techniques (4)
Lectures on the principles and theory of recombinant DNA and molecular cloning techniques. Topics will cover use of restriction and other DNA modifying enzymes, host-vector systems, DNA fragment and plasmid isolation techniques, gene mapping, subcloning techniques, in vitro mutagenesis, cDNA and genomic cloning, screening of clones, blot hybridizations, DNA transfection and use of reporter genes, DNA sequencing and PCR. Also offered for undergraduate-level credit as Bi 430 and may be taken only once for credit.
Prerequisite: Bi 334.

Bi 531 - Recombinant DNA Techniques Laboratory (2)
Laboratory of recombinant DNA and molecular cloning techniques. Co-requisite: Bi 430/530. Also offered for undergraduate-level credit as Bi 431 and may be taken only once for credit.
Prerequisite: Bi 235 or Bi 337. Corequisite: Bi 530.

Bi 532 - Plant Diversity and Evolution (5)
Study of the morphology, structure, and life history of green algae, bryophytes, and vascular plants from an evolutionary point of view. Two 2-hour lectures and one 3-hour laboratory. Also offered for undergraduate-level credit as Bi 432 and may be taken only once for credit.
Corequisite: Bi 532L.

Bi 532L - Lab for Bi 532 (0)
Lab for Bi 532.
Bi 533 - Morphology of Vascular Plants (4)
Study of the gross morphology, development, and structure of roots, stems, leaves, and flowers from an evolutionary point of view. One 3-hour laboratory. Also offered for undergraduate-level credit as Bi 433 and may be taken only once for credit.

Bi 534 - Plant Anatomy (5)
Structure of meristems, cells, tissues, and tissue systems or roots, stems, leaves, flowers and fruits from the developmental and comparative standpoint. One 3-hour laboratory. Also offered for undergraduate-level credit as Bi 434 and may be taken only once for credit.

Bi 535 - Plant Systematics (4)
Angiosperm classification, diversity, and evolutionary relationships. Methods of phylogenetic analysis and current hypotheses regarding angiosperm phylogeny are emphasized. Lab will focus on the form and floral structure of about 30 local plant families. One 3-hour laboratory. Also offered for undergraduate-level credit as Bi 435 and may be taken only once for credit. Expected preparation: Bi 330.

Corequisite: Bi 535L.

Bi 535L - Plant Systematics Lab (0)
Lab for Bi 535. Corequisite: Bi 535.

Bi 536 - Behavioral Endocrinology (4)
Comparative examination of the major hormone systems that regulate behavior across the animal kingdom. Emphasizes the reciprocating nature of hormone and behavior interactions and seeks to understand how natural selection drives the evolution of hormone structure and function. Also offered for undergraduate-level credit as Bi 436 and may be taken only once for credit.

Bi 541 - Plant Physiology (5)
Metabolic activities of plants. Two 3-hour laboratory periods. Also offered for undergraduate-level credit as Bi 441 and may be taken only once for credit. Corequisite: Bi 541L.

Bi 541L - Plant Physiology Lab (0)
Lab for Bi 541. Corequisite: Bi 541.

Bi 542 - Plant Physiology (3)
Biochemical activities of plants, photosynthesis, and respiration. Course is intended to be taken in sequence with Bi 441. Also offered for undergraduate-level credit as Bi 442 and may be taken only once for credit. Expected preparation: Bi 441.

Bi 543 - Advances in Plant Physiology (3)
Lectures and discussions on selected topics in plant physiology; evaluation of current trends in this field. Also offered as Bi 643. Expected preparation: Bi 442 (or concurrently). May be repeated once for credit.

Bi 544 - Plant Anatomy and Morphology Lab (3)
Study of the gross morphology, differentiation in vertebrates and invertebrates. Also offered for undergraduate-level credit as Bi 456 and may be taken only once for credit.

Bi 550 - Phylogenetic Biology (4)
The history of life’s diversification through the use of phylogenetic trees, with a focus on how genes, organisms, and traits have evolved. Includes hands-on computer analyses of DNA sequences. Also offered for undergraduate-level credit as Bi 450 and may be taken only once for credit.

Corequisite: Bi 535L.

Bi 551L - Plant Systematics Lab (0)
Lab for Bi 531. Corequisite: Bi 531.

Bi 552 - Comparative Endocrinology (4)
Evolution of hormone structure and function.  Also offered as Bi 642. Also offered for undergraduate-level credit as Bi 456 and may be taken only once for credit.

Corequisite: Bi 442 (or concurrently). May be repeated once for credit.

Bi 553 - Biology of Aging (3)
The study of molecular and structural changes in animals as a function of age. Emphasis is on the basic biological factors which limit life-span. Recommended prerequisites: Bi 336 or biochemistry, Bi 487.

Bi 555 - Histology (6)
Systemic study, description, and identification of histological structures. Two 3-hour laboratory periods. Also offered for undergraduate-level credit as Bi 455 and may be taken only once for credit.

Bi 555L - Histology Lab (0)
Lab for Bi 555.

Bi 556 - Developmental Biology (4)
Explores basic principles of how organisms develop from a fertilized egg into a complex, multicellular adult. Focuses on contemporary issues in developmental biology, including pattern formation, morphogenesis, determination, and differentiation in vertebrates and invertebrates. Also offered for undergraduate-level credit as Bi 456 and may be taken only once for credit.

Prerequisite: Bi 336 and Bi 341.

Bi 562 - Neurophysiology (4)
Anatomy of the vertebrate central nervous system (CNS). Topics include: Chemical and electrical signaling between cells in the CNS, pharmacological intervention, visual and somatosensory systems, learning, memory, and simple motor pattern generators. Also offered for undergraduate-level credit as Bi 462 and may be taken only once for credit.

Bi 563 - Sensory Physiology (4)
Exploration of the range of animal senses including the principles of sensation and sensory communication in general, and the detailed physiology of transduction for mechanical, electromagnetic, chemical, nociceptive, and thermal senses. Also offered for undergraduate-level credit as Bi 463 and may be taken only once for credit.

Bi 571 - Plant Ecology (4)
A study of the interrelationships between plants and their environment with emphasis upon individual adaptation and community dynamics. One 3-hour laboratory period. Also offered for undergraduate-level credit as Bi 471 and may be taken only once for credit.

Prerequisite: Bi 357. Corequisite: Bi 571L.

Bi 571L - Plant Ecology Lab (0)
Lab for Bi 571. Corequisite: Bi 571.

Bi 572 - Natural History (3)
A study of plant and animal interrelationships, emphasizing maintenance of proper field records, identification, distribution, and ecology of vertebrates in Oregon. Includes one two-hour laboratory. Also offered for undergraduate-level credit as Bi 472 and may be taken only once for credit.

Corequisite: Bi 572L.

Bi 572L - Lab for Bi 572 (0)
Lab for Bi 572. Corequisite: Bi 572.

Bi 573 - Field Sampling (4)
The methods commonly employed for collecting and interpreting ecological data. One 3-hour laboratory. Also offered for
undergraduate-level credit as Bi 473 and may be taken only once for credit.

**Bi 576 - Population Ecology (5)**

Course is designed to explore methods to describe population growth and dynamics of plants and animals. The theoretical foundation for the evolution of life histories will be explored, along with analysis of the influence of interspecific interactions on population processes. Larger landscape-level questions will be addressed by examining populations from the framework of source-sink dynamics, ecological traps, and metapopulations. Also offered for undergraduate-level credit as Bi 476 and may be taken only once for credit.

Prerequisite: Bi 357.

**Bi 576L - Population Ecology Lab (0)**

Lab for Bi 576.

**Bi 581 - Microbial Physiology (3)**

Physiology and biochemistry of microorganisms. Modern contributions to microbiology emphasized. Micro- and macro-molecular anatomy of microbial cells; energy metabolism, biosynthetic pathways and their regulation, kinetic and molecular aspects of growth, genetics, evolution, and ecology, also offered for graduate-level credit as Bi 581 and may be taken only once for credit.

**Bi 585 - Advances in Microbiology (3)**

Analysis of new developments in microbiology including metabolic pathways, anaerobic systems, mechanisms of pathogenicity, and the exploitation of microorganisms to generate products for mankind. Also offered as Bi 685 and may be taken only once for credit. Expected preparation: concurrent with Bi 481/581.

**Bi 589 - Microbiology Physiology Laboratory (1)**

Application of the principles of microbiology in the laboratory. One 3-hour laboratory period. Also offered for undergraduate-level credit as Bi 489 and may be taken only once for credit. Expected preparation: concurrent with Bi 481/581.

**Bi 590 - Advanced Comparative Physiology (4)**

Advanced topics and current research on various aspects of comparative physiology. Also offered as Bi 690 and may be taken only once for credit. Expected preparation: Bi 417 or Bi 418 and Bi 419.

**Bi 592 - Advanced Topics in Marine Mammals (2)**

A study of one or more advanced topics in marine mammals; covering new developments in regard to their evolution, physiological and anatomical adaptations, echolocation, population structure and dynamics, and behavior. Also offered as Bi 692 and may be taken only once for credit. Expected preparation: Bi 416.

**Bi 595 - Advanced Topics in Genetics (2)**

New developments in genetics. Topics to include current research in the areas of genetics, human genetics, evolutionary genetics, and molecular genetics. Also offered as Bi 695 and may be taken only once for credit. Expected preparation: Bi 341.

**Bi 596 - Advanced Topics in Evolution (2)**

New developments in evolution. A study of one or more advanced topics related to the patterns and processes of microevolution and macroevolution. Also offered as Bi 696 and may be taken only once for credit. Expected preparation: Bi 426.

**Bi 597 - Advanced Topics in Mammalogy (3)**

Study of one or more advanced topics in mammalogy. Also offered as Bi 697 and may be taken only once for credit.

**Bi 598 - Graduate Research Prospectus (3)**

Each student develops and presents a thesis prospectus. The prospectus is to include a review of the literature and a detailed statement of significance, specific aims, research design, and methods. All entering biology graduate students (M.S.T., M.A./M.S. and Ph.D.) are required to take this course. Also offered as Bi 698 and may be taken only once for credit.

**Bi 599 - Graduate Grant Writing (3)**

Each student is required to write a major grant proposal based on their research prospectus. All biology graduate students (M.S.T., M.A./M.S. and Ph.D.) are required to take this course. Also offered as Bi 699 and may be taken only once for credit. Expected preparation: Bi 598.

**Bi 601 - Research (0-9)**

See department for course description. (Credit to be arranged.)

**Bi 603 - Dissertation (0-12)**

See department for course description. (Credit to be arranged.)

**Bi 604 - Cooperative Education/Internship (1-9)**

See department for course description. (Credit to be arranged.)

**Bi 605 - Reading and Conference (0-9)**

See department for course description. (Credit to be arranged.)

**Bi 607 - Seminar (1-9)**

See department for course description. (Credit to be arranged.)

**Bi 610 - Selected Topics (1-9)**

See department for course description. (Credit to be arranged.)

**Bi 643 - Advances in Plant Physiology (3)**

Lectures and discussions on selected topics in plant physiology; evaluation of current trends in this field. Also offered as Bi 543. Expected preparation: Bi 442 (or concurrently). May be repeated once for credit.

**Bi 685 - Advances in Microbiology (3)**

Analysis of new developments in microbiology including metabolic pathways, anaerobic systems, mechanisms of
pathogenicity, and the exploitation of microorganisms to generate products for mankind. Also offered as Bi 585 and may be taken only once for credit. Expected preparation: Bi 380.

Bi 690 - Advanced Comparative Physiology (4)
Advanced topics and current research on various aspects of comparative physiology. Also offered as Bi 590 and may be taken only once for credit. Expected preparation: Bi 417 or Bi 418 and Bi 419.

Bi 692 - Advanced Topics in Marine Mammals (2)
A study of one or more advanced topics in marine mammals; covering new developments in regard to their evolution, physiological and anatomical adaptations, echolocation, population structure and dynamics, and behavior. Also offered as Bi 592 and may be taken only once for credit. Expected preparation: Bi 416.

Bi 695 - Advanced Topics in Genetics (2)
New developments in genetics. Topics to include current research in the areas of genetics, human genetics, evolutionary genetics, and molecular genetics. Also offered as Bi 595 and may be taken only once for credit. Expected preparation: Bi 341.

Bi 696 - Advanced Topics in Evolution (2)
New developments in evolution. A study of one or more advanced topics relating to the patterns and processes of microevolution and macroevolution. Also offered as Bi 596 and may be taken only once for credit. Expected preparation: Bi 426.

Bi 697 - Advanced Topics in Mammalogy (3)
Study of one or more advanced topics in mammalogy. Also offered as Bi 597 and may be taken only once for credit.

Bi 698 - Graduate Research Prospectus (3)
Each student develops and presents a thesis prospectus. The prospectus is to include a review of the literature and a detailed statement of significance, specific aims, research design, and methods. All entering biology graduate students (M.S.T., M.A./M.S. and Ph.D.) are required to take this course. Also offered as Bi 598 and may be taken only once for credit.

Bi 699 - Graduate Grant Writing (3)
Each student is required to write a major grant proposal based on their research prospectus. All biology graduate students (M.S.T., M.A./M.S. and Ph.D.) are required to take this course. Also offered as Bi 599 and may be taken only once for credit. Expected preparation: Bi 598.

BSt - Black Studies
BSt 199 - Special Studies (1-4)
See department for course description. (Credit to be arranged.)

BSt 202 - Introduction to Black Studies (4)
Historical and theoretical underpinnings of black studies as an inter- and multidisciplinary field in the arts and humanities. Introduced through exemplary scholarship in African American and Caribbean studies. What makes a specialization unique within the academy and its applicability to other disciplines.

BSt 203 - Introduction to African American History (4)
An introductory sequence designed to provide students with a factual framework and conceptual foundation to analyze the history of the black race in the New World. Primarily a lecture-discussion format augmented with speakers and films, the course will trace the pertinent contacts between the African and European worlds from ancient times to the present. Special consideration will be given to developing the student’s skill to re-examine traditional historical concepts and information from the perspective of the black experience. This is the first course in a sequence of two: BSt 203 and BSt 204.

BSt 204 - Introduction to African American History (4)
An introductory sequence designed to provide students with a factual framework and conceptual foundation to analyze the history of the black race in the New World. Primarily a lecture-discussion format augmented with speakers and films, the course will trace the pertinent contacts between the African and European worlds from ancient times to the present. Special consideration will be given to developing the student’s skill to re-examine traditional historical concepts and information from the perspective of the black experience. This is the second course in a sequence of two: BSt 203 and BSt 204.

BSt 206 - Introduction to Caribbean Studies (4)
Interdisciplinary examination of the historical and cultural experience of the circum-Caribbean regions. Special attention will be given to issues in the creation of multicultural society, such as the dynamics of resistance and the interplay of cultural identity and political domination.

BSt 207 - Introduction to Race, Class, and Gender (4)
Provides theoretical foundation to examine the origins of the categories "race," "gender," and "class" as used in African diasporic societies. Analyzes social, political, economic, and cultural phenomenon as they are influenced by constructed categories. Focus on how the intersections of identities function at the individual, societal and structural levels.

BSt 211A - Introduction to African Studies (4)
An introductory course designed to provide students with an understanding of methods and sources used by the historian of the African past. Museum visits, guest speakers, and films will supplement the lecture format. In addition to a survey of major themes and issues in the history of the African continent, the course will consider the rise of complex societies, indigenous African towns, agricultural and technological achievements, African state systems, and the impact of international trade and Islam on Africa.

Corequisite: BSt 211B.

BSt 211B - Mentored Inquiry (0)
This course is a co-requisite for BSt 211. Assignments from the main inquiry sessions are developed and discussed in mentored inquiry sessions, which are facilitated by a Graduate Mentor who is a PSU graduate student.

Corequisite: BSt 211A.

BSt 211C - African Studies (4)
An introductory course designed to provide students with an understanding of methods and sources used by the historian of the African past. Museum visits, guest speakers,
and films will supplement the lecture format. In addition to a survey of major themes and issues in the history of the African continent, the course will consider the rise of complex societies, indigenous African towns, agricultural and technological achievements, African state systems, and the impact of international trade and Islam on Africa.

Corequisite: BSt 211D.

BSt 211D - Mentored Inquiry (0)

This course is a co-requisite for Bst 211. Assignments from the main inquiry sessions are developed and discussed in mentored inquiry sessions, which are facilitated by a Graduate Mentor who is a PSU graduate student.

Corequisite: Bst 211C.

BSt 214 - Introduction to Contemporary Race and Ethnic Relations (4)

Introductory examination of the origins and manifestations of the socio-historical concept of race. Critical theory approach is used to analyze the manner in which race has been interpreted and its influence on the socio-political relations between races and ethnic groupings. Particular emphasis on topical race issues in the literature which pertain to categorization, gender, culture, and political economy.

BSt 221 - Introduction to African American Literature (4)

An overview of African American fiction, poetry, drama, and expository prose.

BSt 261 - The African American Economic Experience (4)

The role of African-Americans in the American economic system. Employment, wage differentials, welfare payments, and the ghetto economy are examined.

BSt 299 - Special Studies (1-4)

(Credit to be arranged.)

BSt 302 - African American Experience in the 20th Century (4)

An upper-division course designed to examine the history of the black experience in the 20th century. Primarily a discussion-reading format augmented with speakers and films. Special consideration will be given to developing in the student the skill to re-examine traditional concepts and approaches to the study of the black experience within the broader context of mainstream developments in American life and history.

BSt 302U - African American Experience in the 20th Century (4)

An upper-division course designed to examine the history of the black experience in the 20th century. Primarily a discussion-reading format augmented with speakers and films. Special consideration will be given to developing in the student the skill to re-examine traditional concepts and approaches to the study of the black experience within the broader context of mainstream developments in American life and history.

BSt 305 - African History, Before 1800 (4)

An upper-division course designed to survey the history of the African continent from the period of European exploration to the eve of colonialism. Using a lecture/discussion format, the course will examine the impact of the European presence on African institutions and trade, and the relative importance of the environment, technology, and indigenous social systems on the transformation of African society prior to 1800. This is the same course as Hst 312 and may be taken only once for credit.

Prerequisite: Bst 211. Crosslisted as: Hst 312.

BSt 305U - African History, Before 1800 (4)

An upper-division course designed to survey the history of the African continent from the period of European exploration to the eve of colonialism. Using a lecture/discussion format, the course will examine the impact of the European presence on African institutions and trade, and the relative importance of the environment, technology, and indigenous social systems on the transformation of African society prior to 1800. This is the same course as Hst 312 and may be taken only once for credit.

Prerequisite: Bst 211. Crosslisted as: Hst 312.

BSt 306 - African History, 1800-Present (4)

An upper-division course designed to survey the history of the African continent from 1800 to the present, with emphasis on the colonial period, independence and post-independence. This is the same course as Hst 313 and may be taken only once for credit.

Prerequisite: Bst 211. Crosslisted as: Hst 313.

BSt 306U - African History, 1800-Present (4)

An upper-division course designed to survey the history of the African continent from 1800 to the present, with emphasis on the colonial period, independence and post-independence. This is the same course as Hst 313 and may be taken only once for credit.

Prerequisite: Bst 211. Crosslisted as: Hst 313U.

BSt 319 - Traditional Cultures of Africa (4)

Survey of African cultures. Some of the main features examined include: environment and people, oral traditions, time and seasons, naming and numbering systems, language and communication systems, religious, political and legal institutions, music, dance, and family.

BSt 319U - Traditional Cultures of Africa (4)

Survey of African cultures. Some of the main features examined include: environment and people, oral traditions, time and seasons, naming and numbering systems, language and communication systems, religious, political and legal institutions, music, dance, and family. Recommended prerequisite: Bst 211 or Sophomore Inquiry.

BSt 325 - Race and Ethnicity in Latin America (4)

Focus on the experiences of people of African descent in Latin America through the theoretical and empirical research on race and ethnicity in the region. Topics include regional and national variations concerning racial and ethnic identity and the intersection of race/ethnicity, gender and social class. Also explores how Blackness is contested in the media including literature and popular culture.

BSt 325U - Race and Ethnicity in Latin America (4)

Focus on the experiences of people of African descent in Latin America through the theoretical and empirical research on race and ethnicity in the region. Topics include regional and national variations concerning racial and ethnic identity and the intersection of race/ethnicity, gender and social class. Also explores how Blackness is contested in the media including literature and popular culture.
feminism including black lesbian feminism, Analysis of the pluralism within black resistance in the context of race and gender. Hip hop feminism; will redefine feminist manifestations of black feminism, such as slave narratives and ends with contemporary examinations of the historical evolution of black feminism. Examines the people and organizations that shaped black feminist thought and the black liberation movements.

BSt 345 - Black Popular Music: Contextualizing the Black Experience (4)
Explore and contextualize the cultural politics of Black popular music and its implications as a vehicle for interrogating race, class, gender, and sexuality in contemporary U.S. culture. Historical unfolding and developing trends used to demonstrate relevant and associated black experiences.

BSt 351 - African American Literature (4)
A study of African American literature from its oral and folk beginnings to the present. This is the first course in a sequence of two: BSt 351 and BSt 352. This is the same course as Eng 351 and may be taken only once for credit.

Prerequisite: BSt 221 or Eng 256. Crosslisted as: Eng 351.

BSt 351U - African American Literature (4)
A study of African American literature from its oral and folk beginnings to the present. This is the first course in a sequence of two: BSt 351 and BSt 352. This is the same course as Eng 351 and may be taken only once for credit.

Prerequisite: BSt 221 or Eng 256. Crosslisted as: Eng 351U.

BSt 352 - African American Literature (4)
A study of African American literature from its oral and folk beginnings to the present. This is the second course in a sequence of two: BSt 351 and BSt 352. This is the same course as Eng 352 and may be taken only once for credit.

Prerequisite: BSt 221 or Eng 256. Crosslisted as: Eng 352.

BSt 352U - African American Literature (4)
A study of African American literature from its oral and folk beginnings to the present. This is the second course in a sequence of two: BSt 351 and BSt 352. This is the same course as Eng 352 and may be taken only once for credit.

Prerequisite: BSt 221 or Eng 256. Crosslisted as: Eng 352U.

BSt 353 - African American Literature (4)
This course examines portrayals of African women in cinema using selected films from African and African American, traditional Hollywood films and films by African filmmakers. Approaches in comparative analyses of African films are used to examine depictions of African women in traditional and contemporary cultural settings through discussions and reviews.

BSt 353U - African American Literature (4)
This course examines portrayals of African women in cinema using selected films from African and African American, traditional Hollywood films and films by African filmmakers. Approaches in comparative analyses of African films are used to examine depictions of African women in traditional and contemporary cultural settings through discussions and reviews.

BSt 356 - Cuban Film: Politics and Culture (4)
Topics in Cuban history, culture, race, gender, and politics, focusing on the impact of the Cuban revolution on Cuban society, presented through Cuban films are addressed. Films, particularly popular films made in Cuba, and media as primary methods of inquiry, and their global political and cultural implications are critically examined.

BSt 356U - Cuban Film: Politics and Culture (4)
Topics in Cuban history, culture, race, gender, and politics, focusing on the impact of the Cuban revolution on Cuban society, presented through Cuban films are addressed. Films, particularly popular films made in Cuba, and media as primary methods of inquiry, and their global political and cultural implications are critically examined.

BSt 357 - Caribbean Spirituality and Resistance (4)
Latino spiritual/religious practices as they relate to indigenous Caribbean and African communities. Spiritual practices such as Rastafarianism, Obeah, Vodoun and "Spiritism" conceived as a form of cultural and political survival and resistance in colonized, transnational and globalized society provide material for comparison.
Cultures (4)
Portland film festival occurring during the reviews of African cinema using an annual African cultures are explored through and contributions to understanding African cultures are discussed.

BSt 362 - African Prehistory (4)
Methods, sources of evidence, and the results of the study of prehistoric cultures of Africa from the earliest traces until the first written records; it includes human origins (physical and cultural evolution), the earliest civilization, peopling of Africa, migrations, earliest settlements, origins of agriculture and metallurgy. This is the same course as Anth 362 and may be taken only once for credit.

Prerequisite: BSt 211, Anth 102. Crosslisted as: Anth 362.

BSt 362U - African Prehistory (4)
Methods, sources of evidence, and the results of the study of prehistoric cultures of Africa from the earliest traces until the first written records; it includes human origins (physical and cultural evolution), the earliest civilization, peopling of Africa, migrations, earliest settlements, origins of agriculture and metallurgy. This is the same course as Anth 362 and may be taken only once for credit.

Prerequisite: BSt 211, Anth 102. Crosslisted as: Anth 362U.

BSt 363 - African Cinema and African Cultures (4)
African cultures are explored through reviews of African cinema using an annual Portland film festival occurring during the term, and/or in-class screenings. Nature and relevance of African cinema are examined from global perspectives and approaches to film analysis and interpretations; the impact and contributions to understanding African cultures are discussed.

BSt 363U - African Cinema and African Cultures (4)
African cultures are explored through reviews of African cinema using an annual Portland film festival occurring during the term, and/or in-class screenings. Nature and relevance of African cinema are examined from global perspectives and approaches to film analysis and interpretations; the impact and contributions to understanding African cultures are discussed.

BSt 372 - Sociology of Africa: Post-colonial Studies of Africa (4)
This course will explore the relationship and ongoing dynamics between colonizers and the colonized in 20th century Africa, in the context of post-colonial studies. Nationalist, socialist, anti-colonialist, and Apartheid movements in Africa are each a direct consequence of global imperialism and its legacy. This course, will help to understand the social, political and economic implications and dimensions of imperialism in the 20th century.

BSt 372U - Sociology of Africa: Post-colonial Studies of Africa (4)
This course will explore the relationship and ongoing dynamics between colonizers and the colonized in 20th century Africa, in the context of post-colonial studies. Nationalist, socialist, anti-colonialist, and Apartheid movements in Africa are each a direct consequence of global imperialism and its legacy. This course, will help to understand the social, political and economic implications and dimensions of imperialism in the 20th century.

BSt 377 - Vodoun, Rasta and Islam in the African Diaspora (4)
Historical and cultural background to how Voudon, Islam and Rastafarianism became major historical ingredients in colonial African Diaspora, providing major inter-continental contexts for defining and characterizing the process of freedom-fighting and formation of contemporary Caribbean identities in the Americas. Cultural, political and economic implications and impacts are discussed.

BSt 377U - Vodoun, Rasta and Islam in the African Diaspora (4)
Historical and cultural background to how Voudon, Islam and Rastafarianism became major historical ingredients in colonial African Diaspora, providing major inter-continental contexts for defining and characterizing the process of freedom-fighting and formation of contemporary Caribbean identities in the Americas.
BSt 404 - Cooperative Education/internship (1-12)
See department for course description.
(Credit to be arranged.)

BSt 405 - Reading and Conference (0-6)
See department for course description.
(Credit to be arranged.)

BSt 406 - Overseas Experience (1-8)
Provides community-based learning in an international context through immersion in departmental programs in Africa and/or the Caribbean. The fee-based programs provide students with rich, multicultural environments in which to learn and serve international communities. Students will be asked to apply for admission to the overseas programs focused in the Caribbean and Africa.

BSt 406U - Overseas Experience (4)
(Credit to be arranged.)

BSt 407 - Seminar (1-6)
See department for course description.
(Credit to be arranged.)

BSt 408 - Workshop (1-6)
See department for course description.
(Credit to be arranged.)

BSt 409 - Practicum (1-12)
See department for course description.
(Credit to be arranged.)

BSt 409U - Practicum (4)
(Credit to be arranged.)

BSt 410 - Selected Topics (1-6)
See department for course description.
(Credit to be arranged.)

BSt 411 - African American History Seminar (4)
This course will provide an in-depth analysis of critical topics and issues in African American history. The focus will be topical rather than chronological and the approach will emphasize specific periods, individuals, or relevant developments for a concentrated treatment in a seminar environment. Also offered for graduate-level credit as BSt 511.

BSt 412 - Oregon African American History (4)
An examination of the black experience in Oregon history. The course will include coverage of the slavery controversy in early Oregon development as well as the individual contributions of blacks to the growth of the state. Additional topics will include the black migration of World War II, Vanport flood, and various legislative actions related to black status in Oregon.

BSt 412U - Oregon African American History (4)
An examination of the black experience in Oregon history. The course will include coverage of the slavery controversy in early Oregon development as well as the individual contributions of blacks to the growth of the state. Additional topics will include the black migration of World War II, Vanport flood, and various legislative actions related to black status in Oregon.

BSt 413 - Slavery (4)
An examination of the institution which has played a central role in establishing the status and position of the modern black population in American society, both in physical and psychological terms. The course will attempt to put information and understandings of slavery in the proper and accurate context of an institution which has been a part of the human experience since the ancient world and which has a legacy and implications far beyond the racially associated perceptions usually attached to it. The approach will be through the comparative analysis of the numerous forms the institution of slavery has assumed in human history.
Prerequisite: BSt 206, BSt 211, Hst 101, Hst 102.

BSt 414 - Racism (4)
A survey of the pertinent social-psychological literature on individual and cultural forms of racism in America. The rationalizations, processes and machinery of oppression as constructed by white European and American governments which control and exploit the resources of non-white peoples will be examined. Special attention will be paid to the theoretical social-psychological explanations of black/white differences.
Prerequisite: BSt 207, BSt 211, or BSt 214, UnSt 212.

BSt 414U - Racism (4)
A survey of the pertinent social-psychological literature on individual and cultural forms of racism in America. The rationalizations, processes and machinery of oppression as constructed by white European and American governments which control and exploit the resources of non-white peoples will be examined. Special attention will be paid to the theoretical social-psychological explanations of black/white differences.
Prerequisite: BSt 207, BSt 211, or BSt 214, UnSt 212.

BSt 416 - African American Urban Education Problems (4)
Course examines the education systems in major cities being inherited by African-Americans. The relationship between public and private education will be studied for impacts on African-Americans. Educational system response to African American enrollment will be discussed. Moreover, pertinent literature, e.g., the Coleman Report, Jensen's thesis, and others will be introduced with respect to their overall effect on the curricula available to the African American child. Topics of concern include community control, citizen involvement, alternative education forms, race relations, faculty-staff responses, modern trends, etc.
Prerequisite: junior, senior, or graduate-level standing.

BSt 419 - African American Women in America (4)
Designed to investigate the evolution of the African American woman from slavery to the contemporary period. African American women's agency will be examined in the antislavery, suffrage, club, civil rights, nationalist, black feminist, and current movements for social justice.
Prerequisite: BSt 207.

BSt 419U - African American Women in America (4)
Designed to investigate the evolution of the African American woman from slavery to the contemporary period. African American women's agency will be examined in the antislavery, suffrage, club, civil rights, nationalist, black feminist, and current movements for social justice.
Prerequisite: BSt 207.

BSt 420 - Caribbean Literature (4)
A selection of poetry and fiction from the English and French speaking Caribbean (in translation where necessary).
Prerequisite: One previous African American literature course and 12 additional literature credits.

BSt 420U - Caribbean Literature (4)
A selection of poetry and fiction from the English and French speaking Caribbean (in translation where necessary).
Prerequisite: One previous African American literature course and 12 additional literature credits.

BSt 421 - African American Writers (4)
A concentrated examination of significant African American literary figures and their impact on American arts and letters. The course will identify each term a particular author or literary period of writing and then read, analyze, and discuss the major works and the background information of that period. Special consideration will be given to the relationships between the topic of focus and the larger spheres of American and world writing. Also offered for graduate-level credit as BSt 521 and may be taken only once for credit.
Prerequisite: Bst 221; Eng 107, Eng 108, Eng 253, Eng 254.

BSt 422 - African Fiction (4)
Readings in African fiction in regional, cultural, generational, and gender contexts. This is the first course in a sequence of two: BSt 422 and BSt 423.
Prerequisite: One previous African American literature course and 12 additional literature credits.

BSt 422U - African Fiction (4)
Readings in African fiction in regional, cultural, generational, and gender contexts. This is the second course in a sequence of two: BSt 422 and BSt 423.
Prerequisite: One previous African American literature course and 12 additional literature credits.

BSt 423 - African Fiction (4)
Readings in African fiction in regional, cultural, generational, and gender contexts. This is the second course in a sequence of two: BSt 422 and BSt 423.
Prerequisite: One previous African American literature course and 12 additional literature credits.

BSt 424 - African American/African Culture in Cinema (4)
An examination of the treatment accorded black culture and individuals in the evolution of the cinema industry. Coverage will include review and analysis of classic film productions from the infancy of Hollywood through to the black urban films of the modern period. Emphasis will focus on the relationships between racial stereotypes and the creation of majority culture perceptions of the black experience.
Prerequisite: upper-division standing.

BSt 424U - African American/African Culture in Cinema (4)
An examination of the treatment accorded black culture and individuals in the evolution of the cinema industry. Coverage will include review and analysis of classic film productions from the infancy of Hollywood through to the black urban films of the modern period. Emphasis will focus on the relationships between racial stereotypes and the creation of majority culture perceptions of the black experience.
Prerequisite: upper-division standing.

BSt 425 - Black Cinema: the 1970s (4)
Examination of the treatment of Black themes, issues, and characterization during the decade of the 1970s in the cinema industry. Particular attention will be focused on the genre of the blaxploitation film as an industry response to the rapidly shifting social and racial dynamics of American culture as the Civil Rights era wound down.
Prerequisite: upper-division standing.

BSt 426 - Contemporary African American Cinema (4)
Examination of the treatment of Black themes, issues, and characterization in the contemporary cinema industry. Particular attention will be focused on the development of new Black actors, directors, and producers. The impact of these new factors in the industry will be analyzed for the influence they have on the traditions of cinema history relative to the Black experience.
Prerequisite: upper-division standing.

BSt 426U - Contemporary African American Cinema (4)
Examination of the treatment of Black themes, issues, and characterization in the contemporary cinema industry. Particular attention will be focused on the development of new Black actors, directors, and producers. The impact of these new factors in the industry will be analyzed for the influence they have on the traditions of cinema history relative to the Black experience.
Prerequisite: upper-division standing.

BSt 427 - African American Films and Film Makers (4)
Examination of films made by African-Americans from the early years of cinema history down through contemporary films. Examination will include a focus on the internal structure and content of the films as well as consideration of the larger social, cultural, economic, and political context of the society in which the films were produced.

BSt 427U - African American Films and Film Makers (4)
Examination of films made by African-Americans from the early years of cinema history down through contemporary films. Examination will include a focus on the internal structure and content of the films as well as consideration of the larger social, cultural, economic, and political context of the society in which the films were produced.
BSt 430 - African American Political Thought (4)
An examination in-depth of the political theory of African American leaders in America between 1850-1920 and the impact of that thought on American political thought. Also offered for graduate-level credit as BSt 530 and may be taken only once for credit.
Prerequisite: consent of instructor.

BSt 440 - Caribbean Studies (4)
Interdisciplinary examination of historical or cultural issues in the Caribbean experience. Emphasis will be on issues and dilemmas related to the creation of a multicultural society.
Prerequisite: BSt 211 or 206.

BSt 440U - Caribbean Studies (4)
Interdisciplinary examination of historical or cultural issues in the Caribbean experience. Emphasis will be on issues and dilemmas related to the creation of a multicultural society.
Prerequisite: BSt 211 or 206.

BSt 450 - Topics in African/Caribbean History And Culture (4)
In-depth exploration of selected topics in African and/or Caribbean cultural history. Special attention will be given to thematic issues of broad application to the understanding of cultural interaction, continuity, and change. Also offered for graduate-level credit as BSt 550.

BSt 467 - African Development Issues (4)
An examination of the causes of poverty and underdevelopment of the African continent. A comparative analysis of pre-colonial, colonial and post-colonial circumstances will be conducted.
Prerequisite: BSt 211.

BSt 467U - African Development Issues (4)
An examination of the causes of poverty and underdevelopment of the African continent. A comparative analysis of pre-colonial, colonial and post-colonial circumstances will be conducted.
Prerequisite: BSt 211.

BSt 470 - African Art (4)
Examination of selected African art forms, styles, and traditions. Emphasis on the context of the art and artist, and their relationship to politics and society in African history.
Prerequisite: ArH 204, 205, 206, BSt 211.

BSt 470U - African Art (4)
Examination of selected African art forms, styles, and traditions. Emphasis on the context of the art and artist, and their relationship to politics and society in African history.
Prerequisite: ArH 204, 205, 206, BSt 211.

BSt 471 - Understanding the International Experience (4)
Examination of communication-based dimensions of an international or intercultural experience, including teaching English to speakers of other languages. Development of strategies and activities required to meet the challenges of teaching, working, or doing research in an international/intercultural setting.
Prerequisite: upper-division or postbac academic standing. All linguistics students must register for Ling 471/571 which includes a zero-credit lab, however, this course is also offered as Intl 471. Course may only be taken once for credit.

BSt 471U - Understanding the International Experience (4)
Examination of communication-based dimensions of an international or intercultural experience, including teaching English to speakers of other languages. Development of strategies and activities required to meet the challenges of teaching, working, or doing research in an international/intercultural setting.
Prerequisite: upper-division or postbac academic standing. All linguistics students must register for Ling 471/571 which includes a zero-credit lab, however, this course is also offered as Intl 471. Course may only be taken once for credit.
Prerequisite: consent of instructor.

BSt 484 - African American Community Development (4)
Designed to investigate processes of community development for their application to urban African American communities. Topics include community development, community organization, ghettos as colonies, citizen participation, roles of change agents, social planning, and social change implications.
Prerequisite: consent of instructor.

BSt 484U - African American Community Development (4)
Designed to investigate processes of community development for their application to urban African American communities. Topics include community development, community organization, ghettos as colonies, citizen participation, roles of change agents, social planning, and social change implications.
Prerequisite: consent of instructor.

BSt 506 - Overseas Experience (1-8)
Provides community-based learning in an international context through immersion in departmental programs in Africa and/or the Caribbean. The fee-based programs provide students with rich, multicultural environments in which to learn and serve international communities. Students will be asked to apply for admission to the overseas programs focused in the Caribbean and Africa.

BSt 507 - Seminar (1-6)
See department for course description. (Credit to be arranged.)

BSt 511 - African American History Seminar (4)
This course will provide an in-depth analysis of critical topics and issues in African American history. The focus will be topical rather than chronological and the approach will emphasize specific periods, individuals, or relevant developments for a concentrated treatment in a seminar environment. Also offered for undergraduate-level credit as BSt 411.

BSt 512 - Oregon African American History (4)
An examination of the black experience in Oregon history. The course will include coverage of the slavery controversy in early Oregon development as well as the individual contributions of blacks to the growth of the state. Additional topics will include the black migration of World War II, Vanport flood, and various legislative actions related to black status in Oregon.

BSt 513 - Slavery (4)
An examination of the institution which has played a central role in establishing the status and position of the modern black population in American society, both in physical and psychological terms. The course will attempt to put information and understandings of slavery in the proper and accurate context of an institution which has been a part of the human experience since the ancient world and which has a legacy and implications far beyond the racially associated perceptions usually attached to it. The approach will be through the comparative analysis of the numerous forms
the institution of slavery has assumed in human history.

Prerequisite: BSt 206, BSt 211, Hst 101, Hst 102.

BSt 514 - Racism (4)
A survey of the pertinent social-psychological literature on individual and cultural forms of racism in America. The rationalizations, processes and machinery of oppression as constructed by white European and American governments which control and exploit the resources of non-white peoples will be examined. Special attention will be paid to the theoretical social-psychological explanations of black/white differences.

Prerequisite: Bst 207, BSt 211, or BSt 214, UnSt 212.

BSt 516 - African American Urban Education Problems (4)
Course examines the education systems in major cities being inherited by African-Americans. The relationship between public and private education will be studied for impacts on African-Americans. Educational system response to African American enrollment will be discussed. Moreover, pertinent literature, e.g., the Coleman Report, Jensen’s thesis, and others will be introduced with respect to their overall effect on the curricula available to the African American child. Topics of concern include community control, citizen involvement, alternative education forms, race relations, faculty-staff responses, modern trends, etc.

Prerequisite: junior, senior, or graduate-level standing.

BSt 520 - Caribbean Literature (4)
A selection of poetry and fiction from the English and French speaking Caribbean (in translation where necessary).

Prerequisite: One previous African American literature course and 12 additional literature credits.

BSt 521 - African American Writers (4)
A concentrated examination of significant African American literary figures and their impact on American arts and letters. The course will identify each term a particular author or literary period of writing and then read, analyze, and discuss the major works and the background information of that period. Special consideration will be given to the relationships between the topic of focus and the larger spheres of American and world writing. Also offered for undergraduate-level credit as BSt 421 and may be taken only once for credit.

Prerequisite: BSt 221; Eng 107, Eng 108, Eng 253, Eng 254.

BSt 522 - African Fiction (4)
Readings in African fiction in regional, cultural, generational, and gender contexts. This is the first course in a sequence of two: BSt 522 and BSt 523.

Prerequisite: One previous African American literature course and 12 additional literature credits.

BSt 523 - African Fiction (4)
Readings in African fiction in regional, cultural, generational, and gender contexts. This is the second course in a sequence of two: BSt 522 and BSt 523.

Prerequisite: One previous African American literature course and 12 additional literature credits.

BSt 524 - African American/African Culture in Cinema (4)
An examination in-depth of the political theory of African American leaders in America between 1850-1920 and the impact of that thought on American political thought. Also offered for undergraduate-level credit as BSt 430 and may be taken only once for credit.

Prerequisite: consent of instructor.

BSt 525 - Black Cinema: the 1970s (4)
Examines the treatment of Black themes, issues and characterization during the decade of the 1970s in the cinema industry. Particular attention will be focused on the genre of the blaxploitation film as an industry response to the rapidly shifting social and racial dynamics of American culture as the Civil Rights era wound down.

Prerequisite: upper-division standing.

BSt 526 - Contemporary African American Cinema (4)
Examination of the treatment of Black themes, issues, and characterization in the contemporary cinema industry. Particular attention will be focused on the development of new Black actors, directors, and producers. The impact of these new factors in the industry will be analyzed for the influence they have on the traditions of cinema history relative to the Black experience.

Prerequisite: upper-division standing.

BSt 527 - African American Films and Film Makers (4)
Examination of films made by African-Americans from the early years of cinema history down through contemporary films. Examination will include a focus on the internal structure and content of the films as well as consideration of the larger social, cultural, economic, and political context of the society in which the films were produced.

BSt 530 - African American Political Thought (4)
An interdisciplinary examination of cultural issues in the Caribbean experience. Emphasis will be on issues and dilemmas related to the development of a multicultural society.

Prerequisite: Bst 211 or 206.

BSt 550 - Topics in African/Caribbean History And Culture (4)
In-depth exploration of selected topics in African and/or Caribbean cultural history. Special attention will be given to thematic issues of broad application to the understanding of cultural interaction, continuity, and change. Also offered for undergraduate-level credit as BSt 450.
BSt 567 - African Development Issues (4)
An examination of the causes of poverty and underdevelopment of the African continent. A comparative analysis of pre-colonial, colonial and post-colonial circumstances will be conducted.
Prerequisite: BSt 211.

BSt 570 - African Art (4)
Examination of selected African art forms, styles, and traditions. Emphasis on the context of the art and artist, and their relationship to politics and society in African history.
Prerequisite: ArH 204, 205, 206, BSt 211.

BSt 584 - African American Community Development (4)
Designed to investigate processes of community development for their application to urban African American communities. Topics include community development, community organization, ghettos as colonies, citizen participation, roles of change agents, social planning, and social change implications.
Prerequisite: consent of instructor.

CCJ - Criminology & Criminal Justice

CCJ 199 - Special Studies (1-4)
(Credit to be arranged.) Pass/no pass option.

CCJ 200 - Criminology and Criminal Justice (4)
An introduction and overview of the criminology and criminal justice major designed to provide students with an understanding of law, crime, and the criminal justice system in America. Examines the law’s proactive function in teaching people how to live peacefully within their communities and the law’s reactive function in sanctioning criminal behavior. Includes an introduction to various theories of crime causation and an overview of the criminal justice system.

CCJ 220 - Crime Literacy (4)
A comprehensive survey of the historical trends and current picture of crime in America that examines: (1) methods used to collect crime data, (2) factual aspects of specific crimes, including definitions and analytical statistics, (3) characteristics of victims and arrestees, (4) public opinion, and (5) personal protection.

CCJ 230 - Policing in America (4)
An introduction to the study of policing in the United States. Policing is studied from three perspectives: the police officer-citizen interaction, the agency-community relationship, and the legal and ethical questions of policing in a democratic society. The course considers the history and future of policing, the police task, police strategies, and police relationships with the community and criminal justice system.

CCJ 240 - Punishment and Corrections (4)
Examination of historical and contemporary approaches to the punishment of adult and juvenile offenders in institutional and community settings. Includes discussion of theories of punishment as they relate to today’s correctional policies and practices. Controversial topics like prisoner rights, the death penalty, and mandatory sentencing are covered.

CCJ 250 - Criminal Behavior (4)
Examination of psychosocial theories of crime and identification of the individual-level factors associated with the onset, continuity, and desistance of criminal behavior in juveniles and adults. Special topics covered include the relationship between mental illness and violence, psychopathy, sexual deviancy, substance abuse, human aggression, and the rehabilitation of offenders.

CCJ 260 - Criminal Justice and Popular Culture (4)
This course analyzes mass media products such as news programs and periodicals, music, film, and fictional literature to investigate the representation of crime and criminal justice in popular culture and the media impact on the criminal justice system.

CCJ 299 - Special Studies (1-4)
(Credit to be arranged) Pass/no pass option.

CCJ 300 - Criminology and Criminal Justice (4)
An introduction and overview of the criminology and criminal justice major designed to provide students with an understanding of law, crime, and the criminal justice system in America. Examines the law’s proactive function in teaching people how to live peacefully within their communities and the law’s reactive function in sanctioning criminal behavior. Includes an introduction to various theories of crime causation and an overview of the criminal justice system and its response in processing those who transgress the law.

CCJ 301 - Policing in America (4)
An introduction to the study of policing in the United States. Policing is studied from three perspectives: the police officer-citizen interaction, the agency-community relationship, and the legal and ethical questions of policing in a democratic society. The course considers the history and future of policing, the police task, police strategies, and police relationships with the community and criminal justice system.

CCJ 303 - Punishment and Corrections (4)
Examination of historical and contemporary approaches to the punishment of adult and juvenile offenders in institutional and community settings. Includes discussion of theories of punishment as they relate to today’s correctional policies and practices. Controversial topics like prisoner rights, the death penalty, and mandatory sentencing are covered.

CCJ 310 - American Courts (4)
Comprehensive survey of the role and function of courts in the United States. Emphasis placed on the operations of trial-level courts hearing criminal cases. Explores the roles and duties of courtroom participants, structure of the judiciary, relationship between the formal rule of law and daily activities of courts, decision-making, and perspectives from which to view the courts. Attention also to appellate courts, juvenile courts, court reform, and issues of gender, race, and ethnicity.
CCJ 317 - Punishment and Corrections (4)
Examines theories of punishment as they relate to the various treatment and rehabilitation policies and practices that affect offenders in institutional and community settings. Specific approaches being examined include mandatory sentencing laws, offender education programs, institutional and community drug treatment programs, boot camps, house arrest, intensive supervision probation, work release, and community work service.

CCJ 320 - Theories of Crime & Justice (4)
An overview of historical, sociological, biological, psychological, economic, and Marxist theories of crime causation. Particular attention is made to critically analyzing each theory presented in terms of its internal consistency and logic as well as its fit with data on crime, criminals, and victims. Policy implications stemming from these theories will be discussed.

CCJ 320U - Theories of Crime & Justice (4)
An overview of historical, sociological, biological, psychological, economic, and Marxist theories of crime causation. Particular attention is made to critically analyzing each theory presented in terms of its internal consistency and logic as well as its fit with data on crime, criminals, and victims. Policy implications stemming from these theories will be discussed.

CCJ 330 - Crime Control Strategies (4)
An analysis of the methods used to control crime in American society. Emphasis on understanding the sometimes conflicting goals of the criminal justice system; attention is given to the general categories of general and specific deterrence, aggressive enforcement, situational and environmental defensive measures, and modification of the social order. Special attention will be given to how other countries control crime and the problems of comparison because of political and cultural differences.

CCJ 330U - Crime Control Strategies (4)
An analysis of the methods used to control crime in American society. Emphasis on understanding the sometimes conflicting goals of the criminal justice system; attention is given to the general categories of general and specific deterrence, aggressive enforcement, situational and environmental defensive measures, and modification of the social order. Special attention will be given to how other countries control crime and the problems of comparison because of political and cultural differences.

CCJ 340 - Crime Analysis (4)
An introduction to the basic methods used in analyzing data from criminal justice agencies, including temporal and spatial analysis of crime patterns, calculation of crime rates, descriptive analyses of victim and offender characteristics, recidivism, and the identification of offense typologies. Students get hands-on experience coding, analyzing, interpreting, and presenting crime data from a number of sources like police homicide reports, the FBI, Department of Corrections, and attitudinal surveys.
Prerequisite: CS 105 or basic computing skills.

CCJ 350 - Ethical Leadership in Criminal Justice (4)
Ethical leadership is a topic of longstanding theoretical and practical importance for the criminal justice system. Criminal and social justice issues are deeply embedded in the social fabric of the community and ethical leadership issues frequently have ramifications beyond the boundaries of our discipline. Students will be taught to recognize, understand, and analyze the significance of ethical leadership for the criminal justice system and the community within which it exists.

CCJ 350U - Ethical Leadership in Criminal Justice (4)
Ethical leadership is a topic of longstanding theoretical and practical importance for the criminal justice system. Criminal and social justice issues are deeply embedded in the social fabric of the community and ethical leadership issues frequently have ramifications beyond the boundaries of our discipline. Students will be taught to recognize, understand, and analyze the significance of ethical leadership for the criminal justice system and the community within which it exists.

CCJ 355 - Perspectives on Terrorism (4)
A survey of international and domestic terrorism, the organizations, philosophies, key players, counter-terror organizations, and response. Investigation of the social, psychological, cultural, historical, political, religious, and economic dynamics of the phenomena will provide preparation for discussion of possible approaches to control.

CCJ 355U - Perspectives on Terrorism (4)
A survey of international and domestic terrorism, the organizations, philosophies, key players, counter-terror organizations, and response. Investigation of the social, psychological, cultural, historical, political, religious, and economic dynamics of the phenomena will provide preparation for discussion of possible approaches to control.

CCJ 360 - Victimology (4)
Provides a comprehensive overview of the study of victims of crime. This includes research on the process, etiology and consequences of criminal victimization. The criminal justice's response to crime victims, both historically and more recently, will be discussed in terms of the changing role of victims in the criminal equation. Topics covered may include restorative justice, restitution, and mediation programs now offered through the criminal justice system.

CCJ 365 - Criminology and Social Justice Theory (4)
Begins with an analysis of critical criminology theories and their underlying assumptions. Explores the connections between critical criminology and social justice, the social justice movement, and the communities wherein social justice is practiced. Application of social justice theory to criminal justice policy and practice has created a new set of social response mechanisms to crime and delinquency: mediation, restitution, and restorative justice.

CCJ 365U - Criminology and Social Justice Theory (4)
Begins with an analysis of critical criminology theories and their underlying assumptions. Explores the connections between critical criminology and social justice, the social justice movement, and the communities wherein social justice is practiced. Application of social justice theory to criminal justice policy and practice has created a new set of social response mechanisms to crime and delinquency:
mediation, restitution, and restorative justice.

**CCJ 370 - Women, Crime, and Justice (4)**
Women as criminals, victims, and professionals in the criminal justice system are the focus of this course. Theories, policies, and relevant empirical studies will be discussed in the context of the historical, socio-political, and cultural forces that shaped them. Topics may include: girls in gangs, female police officers, mothers behind bars, domestic violence, and pregnancy and drug use.

**CCJ 370U - Women, Crime, and Justice (4)**
Women as criminals, victims, and professionals in the criminal justice system are the focus of this course. Theories, policies, and relevant empirical studies will be discussed in the context of the historical, socio-political, and cultural forces that shaped them. Topics may include: girls in gangs, female police officers, mothers behind bars, domestic violence, and pregnancy and drug use.

**CCJ 380 - Criminal Justice Research (4)**
Introduction to the basic concepts of social science research including hypothesis testing, research design, causality, sampling, and measurement. Course is intended to provide students with necessary skills to critically evaluate crime and delinquency research as well as design and implement basic research projects.

**CCJ 399 - Special Studies (1-9)**
(Credit to be arranged) Pass/no pass option.

**CCJ 399U - Special Studies (4)**
(Credit to be arranged) Pass/no pass option.

**CCJ 401 - Research (1-6)**
(Credit to be arranged) Consent of instructor.

**CCJ 402 - Independent Study (1-4)**
(Credit to be arranged) Consent of instructor.

**CCJ 404 - Cooperative Education/Internship (1-12)**
(Credit to be arranged) Supervised placement in a community criminal justice agency or on a criminal justice research project. Evaluations of students are completed by agency staff and/or University faculty. A minimum of 8 credits is required of CCJ majors. An additional 8 credits can be applied toward CCJ elective credits required of majors. Required: senior status and consent of instructor.

**CCJ 405 - Reading and Conference (1-6)**
(Credit to be arranged) Consent of instructor.

**CCJ 406 - Projects (1-8)**
(Credit to be arranged) Consent of instructor.

**CCJ 407 - Seminar (1-6)**
(Credit to be arranged) Consent of instructor.

**CCJ 409 - Senior Practicum (0-16)**
(Credit to be arranged) Consent of instructor and senior status.

**CCJ 410 - Selected Topics (1-8)**
(Credit to be arranged) Pass/no pass option.

**CCJ 410U - Selected Topics (1-4)**
(Credit to be arranged) Consent of instructor. Pass/no pass option.

**CCJ 415 - Counseling Skills for Criminal Justice (4)**
A practice-oriented course covering the basic interviewing, assessment, and counseling skills routinely used by professionals in the criminal justice field (e.g., police, correctional staff, probation officers, prosecutors). Includes coverage of techniques for developing rapport with clients, soliciting information, screening for mental illness, threat/risk assessment, and crisis intervention.

**CCJ 420 - Criminal Law and Legal Reasoning (4)**
Study of the basic concepts related to criminal law, including: historical development, legal elements of crime and proof, defenses and mitigation, reasonable doubt, and presumptions of fact; with particular emphasis on the application of logical reasoning to make legal decisions. Prerequisite: senior status.

**CCJ 435 - Crime, Crime and Fear (4)**
Crime, grime, and fear is a course designed to study the social, economic, political, and physical factors underlying neighborhood crime and decline. Special attention is given to physical and social incivilities, the "broken windows" theory, police-community partnerships, and problem-solving. Students will work on neighborhood-centered projects to explore solutions to neighborhood crime patterns, disorder, and fear of crime, and ideas for strengthening police-citizen relations, and community building.

**CCJ 440 - Constitutional Criminal Procedures (4)**
A critical examination of the legal controls on the administration of criminal justice, with special attention to current court decisions related to such issues as search and seizure, admissions and confessions, wiretapping and eavesdropping, right to counsel, fair trial, self-incrimination, cruel and unusual punishment. Prerequisite: AJ 420. (Normally offered winter term only.).

**CCJ 450 - Comparative Perspective of Criminal Justice (4)**
An exploration of international criminal justice systems that compares and contrasts the general features and cultural foundations of criminal justice procedures and institutions in different countries throughout the world.

**CCJ 460 - Court Procedures (4)**
General review of the major activities and procedures involved in the conduct of criminal trials, with extensive use of mock trial exercises. Prerequisite: AJ 440. (Normally offered spring term only.).

**CCJ 470 - Morality, Justice and the Law (4)**
Analysis of contemporary problems and issues faced by those working in criminal justice or studying criminology. The course is designed to explore the range of roles, responsibilities, and dilemmas facing professionals in the justice system. Topics may include prosecutorial responsibility, police conduct, and community involvement in criminal justice.

**CCJ 480 - Community-based Treatment of Offenders (4)**
An analysis of the history, philosophy, theory, and function of probation, parole, pardon, halfway houses, work release
centers, and other forms of community-based treatment; evaluation of the effectiveness of treatment of the offender in the community; contemporary usage of the presentence investigation report, selection, supervision, and release of probationers and parolees; exploration of current innovations in corrections such as use of volunteers and offenders as correctional manpower resources. Also offered for graduate-level credit as CCJ 580 and may be taken only once for credit.

CCJ 490 - Senior Colloquium (4)
An integration of important administration of justice concepts and knowledge for graduating majors, who will individually prepare a research paper on a selected problem and present findings to interested students and faculty.
Prerequisite: completion of all other AJ major requirements and scheduled to graduate at end of term in which AJ 490 is taken.

CCJ 501 - Research (1-9)
(Credit to be arranged) Consent of instructor.

CCJ 502 - Independent Study (1-8)
(Credit to be arranged) Consent of instructor.

CCJ 503 - Thesis (1-9)
(Credit to be arranged)

CCJ 504 - Cooperative Education/Internship (1-9)
(Credit to be arranged) Supervised placement in a community criminal justice agency or on a criminal justice research project. Evaluations of students are completed by agency staff and/or University faculty. A minimum of 8 credits is required of CCJ majors. An additional 8 credits can be applied toward CCJ elective credits required of majors. Required: senior status and consent of instructor.

CCJ 505 - Reading and Conference (1-6)
(Credit to be arranged) Consent of instructor.

CCJ 506 - Projects (1-12)
(Credit to be arranged) Consent of instructor.

CCJ 507 - Seminar (1-6)
(Credit to be arranged) Consent of instructor.

CCJ 508 - Workshop (1-8)
(Credit to be arranged) Consent of instructor.

CCJ 509 - Graduate Practicum (1-8)
(Credit to be arranged.)

CCJ 510 - Special Topics (1-8)
(Credit to be arranged) Pass/no pass option.

CCJ 511 - Historical Perspectives of Criminal Justice (3)
A chronological survey of significant social events and trends in Western and Eastern civilizations that have influenced crime and the development of law, the police, the courts, and corrections and have formed the interrelationships among these parts of the criminal justice system.

CCJ 515 - Theories of Crime and Justice (4)
An overview of historical, sociological, biological, psychological, economic, and Marxist theories of crime causation. Particular attention is given to analyzing each theory presented in terms of its internal consistency and logic as well as its fit with data on crime, criminals, and victims. Students will have to test the effectiveness of these individual theories through the research literature available in the criminal justice literature. Policy and programmatic implications stemming from these theories and what the research literature indicates will be discussed in class. Also offered as CCJ 615 and may be taken only once for credit.

CCJ 520 - Analysis of Crime and Justice Data (4)
An applied approach to the analysis of criminal justice data. Includes an overview of the collection, storage, and retrieval of data from various sources (e.g., police, courts, corrections). Basic techniques commonly used to analyze and present criminal justice data are covered with an emphasis on the use of empirical findings to solve problems and develop policy. Advanced statistical procedures introduced. Also offered as CCJ 620 and may be taken only once for credit.

CCJ 525 - Criminal Justice Theory (4)
This course introduces students to the theoretical work on criminal justice process, decision-making, and discretion using multiple disciplinary perspectives. Topics discussed include examination of the stages of the justice process and theoretical approaches to studying individual, organizational, system, and political behavior. Emphasis is placed on the practical utilization of theory to inform development of research problems. Also offered as CCJ 625 and may be taken only once for credit.

CCJ 530 - Criminal Justice Research (4)
The purpose of the course is to familiarize students with typical research methods used in the study of criminology and criminal justice along with their resulting databases. This knowledge base will be used as a foundation upon which to teach students how to critically research in criminology and criminal justice. Also offered as CCJ 630 and may be taken only once for credit. Expected preparation: AJ 520/620.

CCJ 535 - Criminal Justice Policy (4)
An advanced course in criminal justice policy analysis. Course examines the development, implementation, and outcomes of interventions designed to impact crime and the criminal justice system. Theories of criminal justice intervention will be studied across multiple levels: individual, organizational, community, and system. Emphasis is placed on the utilization of research findings to inform criminal justice policy and future research. Also offered as CCJ 535 and may be taken only once for credit. Expected preparation: CCJ 515/615, CCJ 525/625, and CCJ 530/630.

CCJ 540 - Legal Perspective of Criminal Justice (4)
An advanced course that examines the legal environment within which the criminal and quasi-criminal justice systems function, with particular emphasis on philosophical and procedural issues related to deprivation of liberty decisions. Also offered as CCJ 640 and may be taken only once for credit.

CCJ 541 - Evidence Based Practices in Criminal Justice (4)
Analyzes the scientific and theoretical bases of effective criminal justice practices. Application of evidence-based principles and
CCJ 546 - Contemporary Problems in Criminal Justice (4)
Critical analysis of contemporary criminal justice problems. Examines the effect of legal, structural, political and cultural factors on criminal justice responses to social problems. Topic of focus varies. May be repeated once. Also offered as CCJ 641.

CCJ 580 - Community-based Treatment of Offenders (4)
An analysis of the history, philosophy, theory, and function of probation, parole, pardon, halfway houses, work release centers, and other forms of community-based treatment; evaluation of the effectiveness of treatment of the offender in the community; contemporary usage of the presentence investigation report, selection, supervision, and release of probationers and parolees; exploration of current innovations in corrections such as use of volunteers and offenders as correctional manpower resources. Also offered for undergraduate-level credit as CCJ 480 and may be taken only once for credit.

CCJ 601 - Research (1-9)
(Credit to be arranged) Consent of instructor.

CCJ 602 - Independent Study (1-8)
(Credit to be arranged) Consent of instructor.

CCJ 604 - Internship (1-9)
(Credit to be arranged) Supervised placement in a community criminal justice agency or on a criminal justice research project. Evaluations of students are completed by agency staff and/or University faculty. A minimum of 8 credits is required of CCJ majors. An additional 8 credits can be applied toward CCJ elective credits required of majors. Required: senior status and consent of instructor.

CCJ 605 - Reading and Conference (1-6)
(Credit to be arranged) Consent of instructor.

CCJ 606 - Projects (1-12)
(Credit to be arranged) Consent of instructor.

CCJ 607 - Seminar (1-6)
(Credit to be arranged) Consent of instructor.

CCJ 608 - Workshop (1-8)
(Credit to be arranged) Consent of instructor.

CCJ 609 - Graduate Practicum (1-8)
(Credit to be arranged.)

CCJ 610 - Special Topics (1-4)
(Credit to be arranged.) Consent of instructor.

CCJ 615 - Theories of Crime and Justice (4)
An overview of historical, sociological, biological, psychological, economic, and Marxist theories of crime causation. Particular attention is given to analyzing each theory presented in terms of its internal consistency and logic as well as its fit with data on crime, criminals, and victims. Students will have to test the effectiveness of these individual theories through the research literature available in the criminal justice literature. Policy and programmatic implications stemming from these theories and what the research literature indicates will be discussed in class. Also offered as CCJ 515 and may be taken only once for credit.

CCJ 620 - Analysis of Crime and Justice Data (4)
An applied approach to the analysis of criminal justice data. Includes an overview of the collection, storage, and retrieval of data from various sources (e.g., police, courts, corrections). Basic techniques commonly used to analyze and present criminal justice data are covered with an emphasis on the use of empirical findings to solve problems and develop policy. Advanced statistical procedures introduced. Also offered as CCJ 520 and may be taken only once for credit.

CCJ 625 - Criminal Justice Theory (4)
This course introduces students to the theoretical work on criminal justice process, decision-making, and discretion using multiple disciplinary perspectives. Topics discussed include examination of the stages of the justice process and theoretical approaches to studying individual, organizational, system, and political behavior. Emphasis is placed on the practical utilization of theory to inform development of research problems. Also offered as CCJ 525 and may be taken only once for credit.

CCJ 630 - Criminal Justice Research (4)
The purpose of the course is to familiarize students with typical research methods used in the study of criminology and criminal justice along with their resulting databases. This knowledge base will be used as a foundation upon which to teach students how to critically research in criminology and criminal justice. Also offered as CCJ 530 and may be taken only once for credit. Expected preparation: AJ 520/620.

CCJ 635 - Criminal Justice Policy (4)
An advanced course in criminal justice policy analysis. Course examines the development, implementation, and outcomes of interventions designed to impact crime and the criminal justice system. Theories of criminal justice intervention will be studied across multiple levels: individual, organizational, community, and system. Emphasis is placed on the utilization of research findings to inform criminal justice policy and future research. Also offered as CCJ 535 and may be taken only once for credit. Expected preparation: CCJ 515/615, CCJ 525/625, and CCJ 530/630.

CCJ 640 - Legal Perspective of Criminal Justice (4)
An advanced course that examines the legal environment within which the criminal and quasi-criminal justice systems function, with particular emphasis on philosophical and procedural issues related to deprivation of liberty decisions. Also offered as CCJ 540 and may be taken only once for credit.

CCJ 641 - Evidence Based Practices in Criminal Justice (4)
This course introduces students to the theoretical work on criminal justice process, decision-making, and discretion using multiple disciplinary perspectives. Topics discussed include examination of the stages of the justice process and theoretical approaches to studying individual, organizational, system, and political behavior. Emphasis is placed on the practical utilization of theory to inform development of research problems. Also offered as CCJ 525 and may be taken only once for credit.

CCJ 646 - Evidence Based Practices in Criminal Justice (4)
An advanced course that examines the legal environment within which the criminal and quasi-criminal justice systems function, with particular emphasis on philosophical and procedural issues related to deprivation of liberty decisions. Also offered as CCJ 540 and may be taken only once for credit.
CCJ 646 - Contemporary Problems in Criminal Justice (4)
Critical analysis of contemporary criminal justice problems. Examines the effect of legal, structural, political and cultural factors on criminal justice responses to social problems. Topic of focus varies. May be repeated once. Also offered as CCJ 546.

CE - Civil Engineering

CE 111 - Introduction to Civil and Environmental Engineering (3)
Introduction to Civil and Environmental Engineering (CEE) through interaction with practicing professionals, upper class mentors, and professors in CEE. This course will consider the history, ethical concepts, sustainability issues, and communication in CEE. Lectures and laboratory.
Corequisite: CE 111L.

CE 111L - Introduction to Civil and Environmental Engineering Lab (0)
Lab for CE 111.
Corequisite: CE 111.

CE 112 - Civil and Environmental Engineering Computations (3)
Computational techniques in Civil and Environmental Engineering. Development of mathematical techniques to solve engineering problems. Use of statistical and graphical techniques to present engineering data. Introduction to data visualization and computer programming techniques in engineering. Lectures and laboratory.

CE 112L - Civil and Environmental Engineering Computations Lab (0)
Lab for CE 112.

CE 115 - Civil Engineering Drawing and Spatial Analysis (3)
The graphic language applied to civil engineering. Projection systems. Multiview and pictorial representation. Introduction to computer assisted drawing software, geographic information systems and spatial analysis. Lecture and laboratory.
Corequisite: CE 115L.

CE 115L - Civil Engineering Drawing and Spatial Analysis Lab (0)
Lab for CE 115
Corequisite: CE 115.

CE 199 - Special Studies (1-3)
(Credit to be arranged.) Consent of instructor.
Corequisite: CE 199L.

CE 211 - Plane Surveying and Mapping (3)
An introductory analytical treatment of the principles of engineering measurements applied to plane surveys. Origin of datums, random error, observation systems, computations, nonrigorous adjustments, and topographic mapping. Computer applications.
Prerequisite: Mth 251. Corequisite: CE 212.

CE 212 - Field Problems in Plane Surveying (1)
CE 212: Care and operation of plane survey instruments. Field projects in testing instrumental adjustment and executing basic survey circuits. CE 213: Development and completion of a topographic map by field method. CE 214: Layout of a route design; adjustment of optical instruments. Elementary field astronomy. This is the first course in a sequence of three: CE 212, CE 213, and CE 214.
Prerequisite: CE 211 concurrently.
Corequisite: CE 211.

CE 213 - Field Problems in Plane Surveying (1)
CE 212: Care and operation of plane survey instruments. Field projects in testing instrumental adjustment and executing basic survey circuits. CE 213: Development and completion of a topographic map by field method. CE 214: Layout of a route design; adjustment of optical instruments. Elementary field astronomy. This is the second course in a sequence of three: CE 212, CE 213, and CE 214.
Prerequisite: CE 211 concurrently.

CE 214 - Field Problems in Plane Surveying (1)
CE 212: Care and operation of plane survey instruments. Field projects in testing instrumental adjustment and executing basic survey circuits. CE 213: Development and completion of a topographic map by field method. CE 214: Layout of a route design; adjustment of optical instruments. Elementary field astronomy. This is the third course in a sequence of three: CE 212, CE 213, and CE 214.
Prerequisite: CE 211 concurrently.

CE 315 - The Civil and Environmental Engineering Profession (1)
Introduction to civil and environmental engineering (CEE) practice in structural, environmental, geotechnical, and transportation engineering. Overview of education, training, research, and employment opportunities for each area of CEE. Engineering registration and ethics.
Prerequisite: junior standing in CEE.

CE 321 - CEE Properties of Materials (4)
Introduction to structure and properties of civil engineering materials such as steel, asphalt, cement, concrete, soil, wood and polymers. Laboratory tests include evaluation of behavior of these materials under a wide range of conditions. Lectures and laboratory.
Prerequisite: EAS 212. Corequisite: CE 321L.

CE 321L - Lab for CE 321 (0)
Lab for CE 321.
Corequisite: CE 321.

CE 324 - Elementary Structural Analysis (4)
Loads on structures as dictated in various codes and specification; load flow through a structural system and tributary areas; methods of analysis of statistically determinate planar trusses, beams, and frames; concepts of stability and indeterminacy; axial, shear, and bending moment; calculations of displacements and rotations by virtual work, Castigliano's theorem for trusses, beams and frames; computer analysis of structures using an existing commercial program.
Prerequisite: EAS 212 and Mth 254.

CE 325 - Indeterminate Structures (4)
Analysis of indeterminate structures by force and displacement methods; consistent deformations and the theorem of least work; slope deflection; moment distribution including sway; approximate methods.
Prerequisite: CE 324.
CE 341 - Soil Classification and Properties (4)
Determination and interpretation of significant engineering properties and behavior of soils; selected application in mechanics of foundations and earth structures. Three lectures; one 3-hour laboratory period.
Prerequisite: CE 321. Corequisite: CE 341L.

CE 341L - Soil Classification and Properties Lab (0)
Lab for CE 341 Soil Classification and Properties.
Corequisite: CE 341.

CE 345 - Environmental Soil Mechanics (2)
Introduction to the description, classification and significant engineering properties of soils for environmental majors. Emphasis on index properties, permeability and flow nets.
Prerequisite: EAS 212.

CE 345L - Environmental Soil Mechanics Lab (0)
Lab for CE 345.

CE 351 - Introduction to Transportation Engineering (4)
A study of engineering problems associated with the planning and design of urban and intercity transportation with emphasis on systems approach to problem definition and solution. Vehicle operational characteristics and traffic control devices for land, air, and water, data collection methods and development of transportation models for the establishment of design criteria for transportation structures.
Prerequisite: Stat 451 and junior standing in engineering.

CE 361 - Fluid Mechanics (4)
Properties of fluid; fluid statics; fluid dynamics; control volume and Reynolds transport theorem; conservation of mass, momentum and energy; differential analysis; rotational and irrotational flows, non-viscous and viscous flows, Navier Stokes equations. 3 units Lecture and 1 unit laboratory.
Prerequisite: EAS 215 and Mth 256.
Corequisite: CE 361L.

CE 361L - Fluid Mechanics Lab (0)
Lab for CE 361 Fluid Mechanics.

CE 361 - Fluid Mechanics (4)
Application of the principles of fluid mechanics to flow in closed conduits, turbomachinery and open channels. Topics include flow resistance, laminar and turbulent flow and introduction to boundary layer theory; flow in pressurized closed conduits including pipes in series and parallel; turbomachinery including pump systems and turbines; uniform and non-uniform flow in open channels, gradually and rapid varied flow; dimensional analysis and similitude. 3 units lecture and 1 unit laboratory.
Prerequisite: CE 361.

CE 362L - Hydraulics Lab (0)
Lab for CE 362 Hydraulics.

CE 362 - Engineering Hydraulics (4)
Applications of principles of fluid mechanics to flow in closed conduits, turbomachinery and open channels. Topics include flow resistance, laminar and turbulent flow and introduction to boundary layer theory; flow in pressurized closed conduits including pipes in series and parallel; turbomachinery including pump systems and turbines; uniform and non-uniform flow in open channels, gradually and rapidly varied flow; dimensional analysis and similitude. 3 units lecture and 1 unit laboratory.
Prerequisite: CE 361.

CE 362 - Engineering Hydraulics (4)
Principles of hydrology and hydraulic engineering applied to water supply systems design. Collection and distribution, pump stations, water quality and treatment, economic considerations.
Prerequisite: CE 362.

CE 371 - Environmental Engineering (4)
Prerequisite: CE 361.

CE 399 - Special Studies (1-6)
(Credit to be arranged.)

CE 399L - Special Studies Lab (0)
Special studies lab. (Credit to be arranged.)

CE 401 - Research (1-6)
(Credit to be arranged.) Consent of instructor.

CE 402 - Independent Study (1-12)
(Credit to be arranged.)

CE 403 - Honors Thesis (1-4)
(Credit to be arranged.) Consent of instructor.

CE 404 - Cooperative Education/Internship (1-12)
(Credit to be arranged.) Consent of instructor.

CE 405 - Reading and Conference (1-6)
(Credit to be arranged.) Consent of instructor.

CE 406 - Special Projects (1-6)
(Credit to be arranged.) Consent of instructor.

CE 407 - Seminar (1-6)
(Credit to be arranged.) Consent of instructor.

CE 410 - Selected Topics (0-6)
(Credit to be arranged.)

CE 411 - Transportation Seminar (1)
This weekly seminar features a different speaker each week covering various topics in transportation research and practice. The topics cover all modes of transportation, with a focus on current practice. Course is cross-listed course with USP. This course may be taken for credit up to three times. Also offered for graduate-level credit as CE 514.

CE 414 - Transportation Seminar (1)
This weekly seminar features a different speaker each week covering various topics in transportation research and practice. The topics cover all modes of transportation, with a focus on current practice. Course is cross-listed course with USP. This course may be taken for credit up to three times. Also offered for graduate-level credit as CE 514.

CE 417 - Timber Design (4)
Design of solid and glued-laminated beams, columns and arches; shear walls and diaphragms; connections; design provisions for wind and seismic forces. Also offered for graduate-level credit as CE 517 and may be taken only once for credit.
Prerequisite: CE 325.

CE 419 - Bridge Engineering (4)
Introduction to analysis and design of short to medium span highway bridges, including load descriptions, analysis and design procedures outlined in AASHTO Load Resistance Factor Design specifications. Also offered for graduate-level credit as CE 519 and may be taken only once for credit.
Prerequisite: CE 325.

CE 420 - Advanced Mechanics of Materials (4)
Advanced studies in mechanics of materials including fundamentals of elasticity, phenomenological material behavior, and
theories of failure. Timoshenko beam theory, stress functions, shear stresses, unsymmetrical sections, and beams on elastic foundations. Thick-walled cylinders; approximate methods. Also offered for graduate-level credit as CE 520 and may be taken only once for credit.

Prerequisite: EAS 212, Mth 256 or equivalent.

**CE 421 - Analysis of Framed Structures (4)**

Generalized analysis of multi-story and irregular structural framework with classical methods; analysis of arches, curved beams and frames with nonprismatic members. Energy methods with introduction to matrix methods. Also offered for graduate-level credit as CE 521 and may be taken only once for credit.

Prerequisite: CE 325.

**CE 423 - Vibration Analysis in Structural Engineering (4)**

Fundamentals of vibration theory; applications in structural engineering. Free, forced, and transient vibration of single and multi-degrees of freedom systems including damping, normal modes, coupling, and normal coordinates. Also offered for graduate-level credit as CE 523 and may be taken only once for credit.

Prerequisite: EAS 212 and Mth 261.

**CE 431 - Stability of Structures (4)**

Study of elastic and inelastic flexural buckling of bars and frames; use of energy methods and successive approximations; bracing of columns and frames; torsional, lateral-torsional, and local buckling. Also offered for graduate-level credit as CE 531 and may be taken only once for credit.

Prerequisite: CE 432/532, Mth 261 or equivalent.

**CE 432 - Structural Steel Design (4)**

Design of components of steel structures based on allowable strength design and load and resistance factor design methods. Also offered for graduate-level credit as CE 532 and may be taken only once for credit.

Prerequisite: CE 321, CE 325.

**CE 433 - Cold-Formed Steel Design (4)**

Design of cold-formed steel beams, columns, beam-columns, cylindrical tubular members, and connections based on the Allowable Stress Design (ASD) and the Load and Resistance Factor Design (LRFD) methods of the AISI specification. Also offered for graduate-level credit as CE 533 and may be taken only once for credit.

Prerequisite: CE 432/532.

**CE 434 - Principles of Reinforced Concrete (4)**

Loads, load factors and structural safety, ultimate strength analysis; short column behavior, design of simple and continuous beams; one-way slabs; serviceability and detailing requirements with reference to current codes. Also offered for graduate-level credit as CE 534 and may be taken only once for credit.

Prerequisite: CE 321, 325.

**CE 435 - Design of Reinforced Concrete Structures (4)**

Development and splicing of reinforcement; design of long columns, retaining walls, footings, and slabs with reference to current codes; lateral loads; laboratory demonstration of beam and column behavior. Also offered for graduate-level credit as CE 535 and may be taken only once for credit.

Prerequisite: CE 434.

**CE 436 - Masonry Design (3)**

Materials of construction; design of masonry elements, lateral load resisting systems, and connections with reference to current codes. Also offered for graduate-level credit as CE 536 and may be taken only once for credit.

Prerequisite: CE 434.

**CE 438 - Design of Composite Structures (4)**

Design of composite steel-concrete members based on allowable stress design and load and resistance factor design methods. Also offered for graduate-level credit as CE 538 and may be taken only once for credit.

Prerequisite: CE 432/532.

**CE 440 - Geosynthetics in Infrastructure Engineering (2)**

Testing and design with polymer-based geosynthetic products in and on soil for the civil infrastructure. Strength-based design applications are introduced with design-by-function principles, and product approval for transportation, structural, and geotechnical disciplines. Use of geotextiles, geogrids, and geo-composites in slopes, mechanically stabilized earth retaining walls, pavement subgrades, and overlays. Also offered for graduate-level credit as CE 540 and may be taken only once for credit.

Prerequisite: CE 444.

**CE 442 - In Situ Behavior and Testing of Soils (4)**

Introduction to field behavior of soils related to engineering properties; site investigation procedures and in situ testing. Development of fundamental analytical solution techniques for engineering with soil, the use and limitations of elasticity assumptions. Three lectures, one 3-hour laboratory period. Also offered for graduate-level credit as CE 542 and may be taken only once for credit.

Prerequisite: CE 341.

**CE 443 - Introduction To Seismology And Site Evaluation (4)**

Earthquakes and exploration seismology, the origin and occurrence of earthquakes, nature and propagation of seismic waves in the earth, earthquakes as a hazard to life and property. Uses of reflection and refraction exploration seismology, borehole velocity measurements, seismic remote sensing, and direct measurement techniques. Earthquake hazard assessment including liquefaction, ground failure, and site amplification. Techniques for evaluating the susceptibility, potential, and severity of the hazards and other science and engineering applications. This course is the same as G 475/575; course may be taken only once for credit. Also offered for graduate-level credit as CE 543 and may be taken only once for credit.

Prerequisite: senior/graduate standing. Crosslisted as: G 475.

**CE 444 - Geotechnical Design (4)**

Effect of soil conditions upon the behavior and choice of type of foundation; study of earth pressure theories; design of foundations and earth-retaining structures.

Prerequisite: CE 341.

**CE 445 - Geo-environmental Engineering with Geosynthetics (2)**

Application of polymer-based geosynthetic products for geo-environmental and
municipal engineering including landfills, soil erosion control, filters, and drains. Testing, design, and product selection for hydraulic, degradation, and chemical stability properties. Introduction to reliability, endurance, and design life with reference to RCRA, ESA, and EPA laws. Also offered for graduate-level credit as CE 545 and may be taken only once for credit.

Prerequisite: CE 341.

CE 448 - Earthquake Accommodation and Design (4)

Effects of earthquake shaking in the design of buildings, pipelines, bridges, and dams. Incorporating the earthquake hazard assessment for a project in the design process. The goal of this course is to allow geologists, geotechnical engineers, structural engineers, and architects to see how their particular tasks are impacted by the earthquake effects. Types of analysis used to evaluate earthquake design requirements in several disciplines, including: geology, geotechnical engineering, structural engineering, and architecture. This course is the same as G 477; course may be taken only once for credit. Also offered for graduate-level credit as CE 548 and may be taken only once for credit.

Crosslisted as: G 477.

CE 450 - Transportation Safety Analysis (4)

Incorporating safety in highway engineering and transportation planning that includes highway design, operation, and maintenance, as well as human factors, statistical analysis, traffic control and public policy. Design concepts of intersections, interchanges, signals, signs and pavement markings; analyzing data sets for recommendations and prioritization; principles of driver and vehicle characteristics in relation to the roadway. Also offered for graduate-level credit as CE 550 and may be taken only once for credit.

Prerequisite: CE 351.

CE 452 - Freight Transportation and Logistics (4)

Components and performance characteristics of the U.S. freight transportation system, with emphasis on data needs, planning, design, and operation of the entire supply chain. Discussion of impact of freight on passenger transportation system and economy. Modal emphasis includes freight rail, motor freight, ocean freight, and air freight. Terminal operations. Roles of public and private actors in freight system. Also offered for graduate-level credit as CE 553 and may be taken only once for credit.

Prerequisite: CE 351.

CE 454 - Urban Transportation Systems (4)

Urban street patterns and transportation demand, highway capacity analysis, process of urban transport planning, travel-demand forecasting and its application to traffic studies. Development of transport models, multiple regression analysis, models of land use and trip generations, stochastic trip distribution models, applications and case studies. Route assignment analysis and traffic flow theory.

Prerequisite: CE 351.

CE 455 - Intelligent Transportation Systems (4)

Introduction to intelligent transportation systems, including enabling surveillance, navigation, communications, and computer technologies. Application of technologies for monitoring, analysis, evaluation, and prediction of transportation system performance. Intervention strategies, costs and benefits, safety, human factors, institutional issues, and case studies. Also offered for graduate-level credit as CE 555 and may be taken only once for credit.

Prerequisite: CE 351. CE 454 recommended.

CE 456 - Traffic Engineering (4)

Traffic system components, traffic stream characteristics, traffic studies and data collection, volume studies, speed, travel-time, delay and pedestrian studies, capacity analysis, freeway systems, weaving sections, ramp junctions, rural highways, signalized and unsignalized intersections, signal coordination, arterial operations, and access management. Also offered for graduate-level credit as CE 556 and may be taken only once for credit.

Prerequisite: CE 351. CE 454 recommended.

CE 457 - Pavement Design (4)

Pavement structure classification and components, wheel loads and design factors, stresses in flexible pavements, subgrade strength and evaluation, design methods, material characteristics, stresses in rigid pavements, design of concrete pavements, joints and reinforcement, condition surveys. Also offered for graduate-level credit as CE 557 and may be taken only once for credit.

Prerequisite: CE 351.

CE 458 - Public Transportation Systems (4)

Performance characteristics of public transportation systems, with emphasis on urban systems. Planning, design, and operational issues related to public transportation systems. Emerging technologies. Also offered for graduate-level credit as CE 558 and may be taken only once for credit.

Prerequisite: CE 351. CE 454 recommended.

CE 459 - Transportation Operations (4)

Operation, modeling, and control of unscheduled and scheduled transportation modes; elementary traffic flow concepts; flow, density and speed; scheduling; route and bottleneck capacities; networks; data interpretation; analysis techniques; diagrams; simulation queuing; optimization. Also offered for graduate-level credit as CE 559 and may be taken only once for credit.

Prerequisite: CE 351. CE 454 recommended.

CE 462 - Traffic Engineering Applications and Signal Timing (4)

Theory and practice of traffic signal timing. Focuses on terms associated with signal timing, relating practice in the field with analysis completed using the Highway Capacity Manual and other traffic engineering software. A significant portion of the class is focused on applications, specifically focused on multimodal applications. Also offered for graduate-level credit as CE 562 and may be taken only once for credit.

Prerequisite: CE 351.

CE 463 - Transportation and Logistics Optimization and Modeling (4)

Introduction to mathematical modeling techniques including linear programming, integer programming, basic network models (network flows and shortest paths), and their application to transportation and logistics problems. Focus on civil engineering systems and applications on transportation and logistics problems. Also offered for
graduate-level credit as CE 563 and may be taken only once for credit.

Prerequisite: CEE senior standing.

CE 464 - Hydrologic and Hydraulic Modeling (4)

Development and application of deterministic and statistical models for hydrologic and hydraulic analysis and design. Presentation of hydrologic processes and development of hydrologic models related to rainfall-runoff including precipitation, infiltration, evapotranspiration, watershed and channel routing. Statistical analysis procedures for hydrologic data including estimation of rainfall and flood frequency. Application of HEC-HMS to model streamflow including model calibration and verification. Modeling steady flow in rivers using HEC-RAS. Also offered for graduate-level credit as CE 564 and may be taken only once for credit.

Prerequisite: CE 362.

CE 467 - Hydrologic and Hydraulic Design (4)

Application of hydrologic and hydraulic principles to selected topics in hydrologic and hydraulic design. Topics include risk-based design of hydraulic structures, design of culverts, flood profile computation and flood plain management, design of reservoirs. Design of spillways including development of design flood hydrograph and hydraulic design, design of energy dissipation works. Also offered for graduate-level credit as CE 567 and may be taken only once for credit.

Prerequisite: CE 464/564 or knowledge of HEC 1 and HEC 2.

CE 469 - Subsurface Hydrology (4)

Basic principles of aqueous flow in the subsurface, emphasizing the importance of groundwater as a resource. Hydrologic cycle, history of groundwater usage, aquifer classification and properties, Darcy’s experiments and Law, hydraulic head and potential, porosity and permeability, transmissivity and storativity, heterogeneity and anisotropy, saturated vs. unsaturated subsurface flow, and hydraulics of pumping wells (drawdown, flow in confined and unconfined aquifers, steady-state vs. transient flow, slug tests, and aquifer-test design). Also offered for graduate-level credit as CE 569 and may be taken only once for credit.

Prerequisite: CE 371.

CE 474 - Unit Operations of Environmental Engineering (4)

Unit operations of water and wastewater treatment; pretreatment; sedimentation, filtration, aeration, disinfection, sludge treatment and disposal, advanced wastewater treatment processes. Also offered for graduate-level credit as CE 574 and may be taken only once for credit.

Prerequisite: CE 371.

CE 479 - Fate and Transport of Toxics in the Environment (4)

Chemical, physical, and biological principles that govern the behavior of toxic materials such as heavy metals and synthetic organic compounds in the environment. Course emphasizes practical ways to represent chemical processes in models of pollutant behavior. Topics include: adsorption of pollutants on soils and sediments; transport across sediment-water and air-water interfaces; bioamplification of pollutants; multiphase fugacity models of organics; case studies of contaminated surface water, sediment and groundwater. Also offered for graduate-level credit as CE 579; this course is the same as ESM 479 and may be taken only once for credit.

Prerequisite: senior or graduate standing. Crosslisted as: ESM 479.

CE 480 - Chemistry of Environmental Toxins (4)

The fate and transport-related behavior of toxic compounds in the environment. Classification, nomenclature, examples of anthropogenic compounds, and case studies. Introducing the physical and chemical processes associated with air-water exchange, organic-liquid exchange, sorption processes, chemical transformations, and bioaccumulation. Also offered for graduate-level credit as CE 580 and may be taken only once for credit.

Prerequisite: Ch 221; Ch 222 recommended.

CE 481 - The Columbia River as a System (2)

Explores the climate and hydrologic processes that shape the Columbia River basin ecosystem, and relates these processes to the basin’s management context. The geographic scope includes the watershed, the mainstem and its reservoirs, major tributaries, the tidal river below Bonneville Dam, the estuary, the Columbia plume, and coastal waters that interact with the plume. Lectures and outside speakers will present or discuss vital issues in contemporary Columbia Basin management, along with relevant background information. Also offered for graduate-level credit as CE 581 and may be taken only once for credit.

Expected preparation: CE 361 and CE 371. Prerequisite: junior standing.

CE 482 - Introduction to Sediment Transport (4)

Fundamentals of sediment transport in natural surface waters. Analysis of the governing equations of mass, momentum, and sediment conservation. Covers bedload and suspended material transport in riverine and estuarine waters, focusing on non-cohesive materials. Cohesive material transport will be briefly introduced. Also offered for graduate-level credit as CE 582 and may be taken only once for credit.

Prerequisite: CE 361, CE 371.

CE 483 - Estuarine Circulation (4)

Introduction to the physical processes that govern estuarine and buoyant plume circulation. These include tides, density-driven circulation, internal tidal asymmetry and frontal propagation. Also offered for graduate-level credit as CE 583 and may be taken only once for credit. Expected preparation: CE 576.

Prerequisite: CE 361 and CE 371.

CE 484 - Civil Engineering Project Management and Design I (3)

Engineering design process including owner design, professional-constactor relationships, procurement procedures, project evolution; contracts, dispute resolution, bonds, warranties; construction documents, including specifications; cost estimating, scheduling, and scheduling; construction administration; group process, diversity, and leadership. Two lectures, one 3-hour design project laboratory period.

Prerequisite: senior standing in Civil or Environmental Engineering. Corequisite: CE 484L.
CE 484L - Civil Engineering Project Management and Design I Lab (0)
Lab for CE 484 Civil Engineering Project Management and Design I.
Corequisite: CE 484.

CE 485 - Environmental Cleanup and Restoration (4)
Survey of procedures for evaluating risks posed by hazardous waste sites and the cleanup steps that lead to an acceptable restoration of such sites. Topics include U.S. environmental law and regulation, site investigations, risk assessment, and a focus on actual case studies, many in Portland and the Pacific Northwest. Also offered for graduate-level credit as CE 585 and may be taken only once for credit.
Prerequisite: junior standing, CE 371 or equivalent.

CE 486 - Environmental Chemistry (4)
Survey of chemical aspects of major environmental issues: stratospheric ozone holes and chlorofluorocarbons; air pollution; global climate change; fossil fuel energy; carbon footprint; renewable energy; nuclear energy; radioactivity; toxic chemicals (pesticides, PCBs); endocrine disruptors; surfactants, chemical dispersants/oil spills; biodegradability of chemicals; chemistry of natural waters; acid rain; toxic heavy metals. Also offered for graduate-level credit as CE 586 and may be taken only once for credit. This is the same course as Ch 486 and can be taken only once for credit.
Prerequisite: Ch 334 or 331. Crosslisted as: Ch 486.

CE 487 - Aquatic Chemistry (4)
Aqueous chemistry in natural water systems: simple-to-complex acid/base chemistry; titration curves; buffer strength; acid/base chemistry of carbon dioxide in open and closed systems; alkalinity as system variable (blood); mineral dissolution/precipitation (metal carbonates); redox chemistry: pe-pH, redox succession/organic loading/dissolved oxygen loss, nitrate reduction, iron oxide dissolution, hydrogen sulfide production, methane formation. Also offered for graduate-level credit as CE 587 and may be taken only once for credit. This is the same course as Ch 487 and can be taken only once for credit.
Prerequisite: Ch 223 with a C- or better. Crosslisted as: Ch 487.

CE 488 - Air Quality (4)
An overview of urban air quality issues facing cities in the US and globally. Examine effects of air pollution on public health and environment, as well as technologies and regulatory practices. Review pollution measurement and modeling techniques. This course is the same as ESM 460/560; may only be taken once for credit. Expected preparation: CE 371.
Prerequisite: junior standing. Crosslisted as: ESM 460.

CE 489 - Introduction to Advanced Environmental Fluid Mechanics (4)
Advanced introduction to the geophysical fluid flows, including properties of seawater; conservation of mass, energy and momentum; dimensional analysis; the Navier-Stokes, Reynolds and turbulent kinetic energy equations; geostrophy and potential vorticity; long and short waves; and turbulence and boundary layers. Lecture and laboratory. Also offered for graduate-level credit as CE 589 and may be taken only once for credit.
Prerequisite: EAS 215, Mth 256, CE 361, CE 362. Corequisite: CE 489L.

CE 489L - Lab for CE 489 (0)
Lab for CE 489.
Corequisite: CE 489.

CE 490 - Soil and Groundwater Restoration (4)
Methods for restoring contaminated soil and groundwater; Factors and processes influencing the efficacy of remediation systems. Emphasis on the scientific principles upon which soil and groundwater remediation is based. Containment, pump and treat, cosolvents and surfactants, soil venting, in-situ physical and chemical treatment. Also offered for graduate-level credit as CE 590 and may be taken only once for credit.
Prerequisite: senior/grad standing.

CE 493 - Design and Operation of Bicycle and Pedestrian Infrastructure (4)
Design and operational concepts in the engineering design of bicycle and pedestrian infrastructure. Course covers on-road and shared path locations. Specific topics include design details of bikeways, basic geometric design, intersection and signalization considerations, and ADA requirements supporting non-motorized modes. Also offered for graduate credit as CE 593 and may be taken only once for credit.
Prerequisite: CE 454.

CE 494 - Civil Engineering Project Management and Design II (3)
Synthesis of civil engineering specialties in a diverse multi-disciplinary project. Teamwork approach in design of components and systems to meet stated objectives. Consideration of alternative solutions, methods, and products including constraints such as economic factors, safety, reliability, and ethics. Preparation of design documents, including: memoranda, computations, drawings, cost estimates, specifications, bidding materials; written and oral presentations. Two lectures, one 3-hour design project laboratory period.
Prerequisite: CE 484. Corequisite: CE 494L.

CE 494L - Civil Engineering Project Management and Design II Lab (0)
Lab for CE 494 Civil Engineering Project Management and Design II.
Corequisite: CE 494.

CE 495 - Sustainable Transportation in the Netherlands (5)
Introduction to transportation engineering and planning applications in the Netherlands, focusing on pedestrian, bicycle and public transport. Contrasts between U.S. and Dutch engineering principles, policies and standards. Design principles and practice will be explored through field trips and guest lectures while abroad and in Portland. Faculty led study abroad course. Also offered for graduate-level credit as CE 595 and may be taken only once for credit.
Prerequisite: Minimum GPA 3.0, senior status or graduate level from all disciplines and majors.

CE 501 - Research (1-9)
(Credit to be arranged.) Consent of instructor.

CE 502 - Independent Study (1-9)
Credit to be arranged.
CE 503 - Thesis (1-9)
(Credit to be arranged.) Consent of instructor.
CE 504 - Cooperative Education/Internship (1-9)
(Credit to be arranged.) Consent of instructor.
CE 505 - Reading and Conference (1-6)
(Credit to be arranged.) Consent of instructor.
CE 506 - Special Projects (1-9)
(Credit to be arranged.) Consent of instructor.
CE 507 - Seminar (1-6)
(Credit to be arranged.) Consent of instructor.
CE 510 - Selected Topics (0-6)
(Credit to be arranged.) Consent of instructor.
CE 514 - Transportation Seminar (1)
This weekly seminar features a different speaker each week covering various topics in transportation research and practice. The topics cover all modes of transportation, with a focus on current practice. Course is cross-listed course with USP. This course may be taken for credit up to three times. Also offered for undergraduate-level credit as CE 414 and may be taken only once for credit.
Prerequisite: CE 325.
CE 517 - Timber Design (4)
Design of solid and glued-laminated beams, columns and arches; shear walls and diaphragms; connections; design provisions for wind and seismic forces. Also offered for undergraduate-level credit as CE 417 and may be taken only once for credit.
Prerequisite: CE 325.
CE 518 - Prestressed Concrete Design (4)
Analysis and design of components of prestressed concrete structures with reference to current codes. Also offered as CE 418 and may be taken only once for credit.
Prerequisite: CE 435/535.
CE 519 - Bridge Engineering (4)
Introduction to analysis and design of short to medium span highway bridges, including load descriptions, analysis and design procedures outlined in AASHTO Load Resistance Factor Design specifications. Also offered for undergraduate-level credit as CE 419 and may be taken only once for credit.
Prerequisite: CE 325.
CE 520 - Advanced Mechanics of Materials (4)
Advanced studies in mechanics of materials including fundamentals of elasticity, phenomenological material behavior, and theories of failure. Timoshenko beam theory, stress functions, shear stresses, unsymmetrical sections, and beams on elastic foundations. Thick-walled cylinders; approximate methods. Also offered for undergraduate-level credit as CE 420 and may be taken only once for credit.
Prerequisite: EAS 212, Mth 256 or equivalent.
CE 521 - Analysis of Framed Structures (4)
Generalized analysis of multi-story and irregular structural framework with classical methods; analysis of arches, curved beams and frames with nonprismatic members. Energy methods with introduction to matrix methods. Also offered for undergraduate-level credit as CE 421 and may be taken only once for credit.
Prerequisite: CE 325.
CE 522 - Vibration Analysis in Structural Engineering (4)
Fundamentals of vibration theory; applications in structural engineering. Free, forced, and transient vibration of single and multi-degrees of freedom systems including damping, normal modes, coupling, and normal coordinates. Also offered for undergraduate-level credit as CE 423 and may be taken only once for credit.
Prerequisite: CE 325.
CE 523 - Vibration Analysis in Structural Engineering (4)
Fundamentals of vibration theory; applications in structural engineering. Free, forced, and transient vibration of single and multi-degrees of freedom systems including damping, normal modes, coupling, and normal coordinates. Also offered for undergraduate-level credit as CE 423 and may be taken only once for credit.
Prerequisite: CE 325.
CE 524 - Matrix and Computer Methods in Structural Analysis (4)
Fundamental concepts of analysis for statically determinate and indeterminate structures utilizing matrices and computers; displacement and force methods applied to trusses and rigid frames; techniques for the analysis of large complex structures for static and dynamic loads. Also offered as CE 624 and may be taken only once for credit. This is the first course in a sequence of two: CE 524 and CE 525.
Prerequisite: CE 325.
CE 526 - Theory of Plates (4)
Small and large deformation theories of thin plates; numerical and energy methods; free vibrations. Also offered as CE 626 and may be taken only once for credit.
Prerequisite: Mth 256.
CE 527 - Finite Elements in Structural Mechanics (4)
Principles of stiffness analysis of structures, essentials of the finite element formulation of elastic problems with applications to structural mechanics, plates and shells, and other related problems utilizing digital computers. Also offered as CE 627 and may be taken only once for credit. This is the first course in a sequence of two: CE 527 and CE 528.
Prerequisite: CE 524/624.
CE 528 - Finite Elements in Structural Mechanics (4)
Principles of stiffness analysis of structures, essentials of the finite element formulation of elastic problems with applications to structural mechanics, plates and shells, and other related problems utilizing digital computers. Also offered as CE 628 and may be taken only once for credit. This is the second course in a sequence of two: CE 527 and CE 528.
Prerequisite: CE 524/624.
CE 529 - Structural Dynamics (4)
Determination of normal modes and frequencies for structural systems. Transient and steady state response. Derivation and solution of governing equations using matrix formulation. Analysis of linear response of structures to dynamic loadings. Stresses and deflections in structures. Also offered as CE 629 and may be taken only once for credit.
Prerequisite: CE 423/523.
CE 531 - Stability of Structures (4)
Study of elastic and inelastic flexural buckling of bars and frames; use of energy methods and successive approximations; bracing of columns and frames; torsional, lateral-torsional, and local buckling.
CE 534 - Advanced Reinforced Concrete
Prerequisite: CE 432/532.
may be taken only once for credit.

CE 533 - Cold-Formed Steel Design (4)
Design of cold-formed steel beams, columns, beam-columns, cylindrical tubular members, and connections based on allowable strength design and load and resistance factor design methods. Also offered for undergraduate-level credit as CE 433 and may be taken only once for credit.

Prerequisite: CE 432/532.

CE 534 - Advanced Reinforced Concrete Design (3)
Design of spandrel beams, slabs on beams, shear walls, deep beams, corbels, and other components of reinforced concrete structures with reference to current codes. Also offered as CE 634 and may be taken only once for credit.

Prerequisite: CE 435.

CE 535 - Design of Reinforced Concrete Structures (4)
Development and splicing of reinforcement; design of long columns, retaining walls, footings, and slabs with reference to current codes; lateral loads; laboratory demonstration of beam and column behavior. Also offered for undergraduate-level credit as CE 435 and may be taken only once for credit.

Prerequisite: CE 434.

CE 536 - Masonry Design (3)
Materials of construction; design of masonry elements, lateral load resisting systems, and connections with reference to current codes. Also offered for undergraduate-level credit as CE 436 and may be taken only once for credit.

Prerequisite: CE 434.

CE 537 - Earthquake Engineering (4)
Response of structures to ground motions; determination and use of response spectra; seismic design criteria and provisions for buildings and other structures; and review of current practices for earthquake resistant design. Also offered as CE 637 and may be taken only once for credit.

Prerequisite: CE 529/629.

CE 538 - Design of Composite Structures (4)
Design of composite steel-concrete members based on allowable stress design and load and resistance factor design methods. Also offered for undergraduate-level credit as CE 438 and may be taken only once for credit.

Prerequisite: CE 432/532.

CE 539 - Advanced Steel Design (4)
Analysis and design of metal structures including connections, plate girders, design loads, structural systems, and bracing. Also offered as CE 639 and may be taken only once for credit.

Prerequisite: CE 432/532.

CE 540 - Geosynthetics in Infrastructure Engineering (2)
Testing and design with polymer-based geosynthetic products in and on soil for the civil infrastructure. Strength-based design applications are introduced with design-by-function principles, and product approval for transportation, structural, and geotechnical disciplines. Use of geotextiles, geogrids, and geo-composites in slopes, mechanically stabilized earth retaining walls, pavement subgrades, and overlays. Also offered for undergraduate-level credit as CE 440 and may be taken only once for credit.

Prerequisite: CE 444.

CE 541 - Advanced Soil Mechanics (4)
Study of the advanced principles of soil behavior related to stress-strain, shear strength, permeability, and consolidation. Also offered as CE 641 and may be taken only once for credit.

Prerequisite: CE 444.

CE 542 - In Situ Behavior and Testing of Soils (4)
Introduction to field behavior of soils related to engineering properties; site investigation procedures and in situ testing. Development of fundamental analytical solution techniques for engineering with soil, the use and limitations of elasticity assumptions. Three lectures, one 3-hour laboratory period. Also offered for undergraduate-level credit as CE 442 and may be taken only once for credit.

Prerequisite: CE 341.

CE 543 - Introduction To Seismology And Site Evaluation (4)
Earthquakes and exploration seismology, the origin and occurrence of earthquakes, nature and propagation of seismic waves in the earth, earthquakes as a hazard to life and property. Uses of reflection and refraction exploration seismology, borehole velocity measurements, seismic remote sensing, and direct measurement techniques. Earthquake hazard assessment including liquefaction, ground failure, and site amplification. Techniques for evaluating the susceptibility, potential, and severity of the hazards and other science and engineering applications. This course is the same as G 475/575; course may be taken only once for credit. Also offered for undergraduate-level credit as CE 443 and may be taken only once for credit.

Prerequisite: senior/graduate standing. Crosslisted as: G 575.

CE 544 - Advanced Shallow Foundation Design (4)
Advanced topics in settlement and bearing capacity analysis of shallow foundation; application of numerical schemes to foundation design. Also offered as CE 644 and may be taken only once for credit.

Prerequisite: CE 444.

CE 545 - Geo-environmental Engineering with Geosynthetics (2)
Application of polymer-based geosynthetic products for geo-environmental and municipal engineering including landfills, soil erosion control, filters, and drains. Testing, design, and product selection for hydraulic, degradation, and chemical stability properties. Introduction to reliability, endurance, and design life with reference to RCRA, ESA, and EPA laws. Also offered for undergraduate-level credit as CE 445 and may be taken only once for credit.

Prerequisite: CE 341.
CE 546 - Numerical Methods in Soil-Structure Interaction (4)

Application of finite difference and finite element methods to the solution of soil-structure problems, stability of soil masses and foundation installation. Use of commercial computer programs in working applied problems. Also offered as CE 646 and may be taken only once for credit.

Prerequisite: CE 444.

CE 548 - Earthquake Accommodation and Design (4)

Effects of earthquake shaking in the design of buildings, pipelines, bridges, and dams. Incorporating the earthquake hazard assessment for a project in the design process. The goal of this course is to allow geologists, geotechnical engineers, structural engineers, and architects to see how their particular tasks are impacted by the earthquake effects. Types of analysis used to evaluate earthquake design requirements in several disciplines, including: geology, geotechnical engineering, structural engineering, and architecture. This course is the same as G 577; course may be taken only once for credit. Also offered for undergraduate-level credit as CE 448 and may be taken only once for credit.

Crosslisted as: G 577.

CE 549 - Deep Foundation Design and Analysis (4)

Comprehensive study of both driven and augered pile foundations, including concrete, steel, and timber. In-depth review of design methods for axial and lateral capacity. Special emphasis on the differences between driven piles and drilled shafts, including the role of full-scale load testing in the semi-empirical methods. Introduction to group theory in elasticity and plasticity. Also offered as CE 649 and may be taken only once for credit.

Prerequisite: CE 444.

CE 550 - Transportation Safety Analysis (4)

Incorporating safety in highway engineering and transportation planning that includes highway design, operation, and maintenance, as well as human factors, statistical analysis, traffic control and public policy. Design concepts of intersections, interchanges, signals, signs and pavement markings; analyzing data sets for recommendations and prioritization; principles of driver and vehicle characteristics in relation to the roadway. Also offered for undergraduate-level credit as CE 450 and may be taken only once for credit.

Prerequisite: CE 351.

CE 553 - Freight Transportation and Logistics (4)

Components and performance characteristics of the U.S. freight transportation system, with emphasis on data needs, planning, design, and operation of the entire supply chain. Discussion of impact of freight on passenger transportation system and economy. Modal emphasis includes freight rail, motor freight, ocean freight, and air freight. Terminal operations. Roles of public and private actors in freight system. Also offered for undergraduate-level credit as CE 453 and may be taken only once for credit.

Prerequisite: CE 351.

CE 554 - Introduction to Multimodal Transportation Engineering Data Analysis (4)

An introduction to multimodal transportation engineering data sets through applied analysis and visualization techniques. Includes an overview of data types, techniques for graphical analysis of data, and exposure to common software and statistical tools and visualizations in transportation engineering.

Prerequisite: graduate admission in Civil and Environmental Engineering.

CE 555 - Intelligent Transportation Systems (4)

Introduction to intelligent transportation systems, including enabling surveillance, navigation, communications, and computer technologies. Application of technologies for monitoring, analysis, evaluation, and prediction of transportation system performance. Intervention strategies, costs and benefits, safety, human factors, institutional issues, and case studies. Also offered for undergraduate-level credit as CE 455 and may be taken only once for credit.

Prerequisite: CE 351. CE 454 recommended.

CE 556 - Traffic Engineering (4)

Traffic system components, traffic stream characteristics, traffic studies and data collection, volume studies, speed, travel-time, delay and pedestrian studies, capacity analysis, freeway systems, weaving sections, ramp junctions, rural highways, signalized and unsignalized intersections, signal coordination, arterial operations, and access management. Also offered for undergraduate-level credit as CE 456 and may be taken only once for credit.

Prerequisite: CE 454.

CE 557 - Pavement Design (4)

Pavement structure classification and components, wheel loads and design factors, stresses in flexible pavements, subgrade strength and evaluation, design methods, material characteristics, stresses in rigid pavements, design of concrete pavements, joints and reinforcement, condition surveys. Also offered for undergraduate-level credit as CE 457 and may be taken only once for credit.

Prerequisite: CE 351.

CE 558 - Public Transportation Systems (4)

Performance characteristics of public transportation systems, with emphasis on urban systems. Planning, design, and operational issues related to public transportation systems. Emerging technologies. Also offered for undergraduate-level credit as CE 458 and may be taken only once for credit.

Prerequisite: CE 351. CE 454 recommended.

CE 559 - Transportation Operations (4)

Operation, modeling, and control of unscheduled and scheduled transportation modes; elementary traffic flow concepts; flow, density and speed; scheduling; route and bottleneck capacities; networks; data interpretation; analysis techniques; diagrams; simulation queuing; optimization. Also offered for undergraduate-level credit as CE 459 and may be taken only once for credit.

Prerequisite: CE 351. CE 454 recommended.

CE 561 - Water Resource Systems Analysis (4)

A development of quantitative techniques used in the analysis of water resource...
systems for planning, design and operation. Emphasis is placed on the physical, legal and economic aspects and their incorporation into simulation models. Applications include reservoir systems for water supply and hydropower, irrigation planning and operation, and water quality management. Also offered as CE 661 and may be taken only once for credit.

Prerequisite: CE 464/564 or equivalent.

CE 562 - Traffic Engineering Applications and Signal Timing (4)

Theory and practice of traffic signal timing. Focuses on terms associated with signal timing, relating practice in the field with analysis completed using the Highway Capacity Manual and other traffic engineering software. A significant portion of the class is focused on applications, specifically focused on multimodal applications. Also offered for undergraduate-level credit as CE 462 and may be taken only once for credit.

Prerequisite: CE 351.

CE 563 - Transportation and Logistics Optimization and Modeling (4)

Introduction to mathematical modeling techniques including linear programming, integer programming, basic network models (network flows and shortest paths), and their application to transportation and logistics problems. Focus on civil engineering systems and applications on transportation and logistics problems. Also offered for undergraduate-level credit as CE 463 and may be taken only once for credit.

Prerequisite: CEE senior standing.

CE 564 - Hydrologic and Hydraulic Modeling (4)

Development and application of deterministic and statistical models for hydrologic and hydraulic analysis and design. Presentation of hydrologic processes and development of hydrologic models related to rainfall-runoff including precipitation, infiltration, evapotranspiration, watershed and channel routing. Statistical analysis procedures for hydrologic data including estimation of rainfall and flood frequency. Application of HEC-HMS to model streamflow including model calibration and verification. Modeling steady flow in rivers using HEC-RAS. Also offered for undergraduate-level credit as CE 464 and may be taken only once for credit.

Prerequisite: CE 362.

CE 565 - Watershed Hydrology (4)

Study of the movement and storage of water in watersheds, emphasizing physical processes. Includes systems analysis of watersheds, precipitation, snowmelt, infiltration, evapotranspiration, groundwater flow, stream flow generation, open channel flow, hydrograph analysis, and an introduction to watershed hydrological modeling.

Prerequisite: Mth 252, Ph 201, Stat 244; recommended: ESR 320 and/or an undergraduate course, such as CE 464.

CE 566 - Environmental Data Analysis (4)

Application of probabilistic and statistical models to the description of environmental data with a focus on hydrology and water quality. Graphical and quantitative techniques of exploratory data analysis, selection and fitting of appropriate probability distributions, simple and multiple and multivariate regression and their applications to analysis and modeling, and detection of changes and trends in environmental time series. Also offered as CE 666 and may be taken only once for credit. This is the same course as ESM 566 and may be taken only once for credit.

Prerequisite: graduate standing and Stat 243 and 244 or Stat 460. Crosslisted as: ESM 566.

CE 567 - Hydrologic and Hydraulic Design (4)

Application of hydrologic and hydraulic principles to selected topics in hydrologic and hydraulic design. Topics include risk-based design of hydraulic structures, design of culverts, flood profile computation and flood plain management, design of reservoirs. Design of spillways including development of design flood hydrograph and hydraulic design, design of energy dissipation works. Also offered for undergraduate-level credit as CE 467 and may be taken only once for credit.

Prerequisite: CE 464/564 or knowledge of HEC 1 and HEC 2.

CE 568 - Advanced Methods in Hydrologic System Analysis (4)

Principles in analysis of dynamic systems with specific emphasis on hydrologic model building. Variety of techniques in hydrologic system analysis with mathematical formulation, development and use of computer-based models for solving scientific and engineering problems are discussed. Among the topics presented will be the discussion of optimization theory, artificial intelligence, model calibration (parameter estimation), ensemble (probabilistic) forecasting, data assimilation and uncertainty analysis. Also offered as CE 668 and may be taken only once for credit. Recommended prerequisites: CE 465/565 or similar course.

CE 569 - Subsurface Hydrology (4)

Basic principles of aqueous flow in the subsurface, emphasizing the importance of groundwater as a resource. Hydrologic cycle, history of groundwater usage, aquifer classification and properties, Darcy’s experiments and Law, hydraulic head and potential, porosity and permeability, transmissivity and storativity, heterogeneity and anisotropy, saturated vs. unsaturated subsurface flow, and hydraulics of pumping wells (drawdown, flow in confined and unconfined aquifers, steady-state vs. transient flow, slug tests, and aquifer-test design). Also offered for undergraduate-level credit as CE 469 and may be taken only once for credit.

CE 570 - Groundwater Modeling (4)

The objective is to give students a good introduction to practical groundwater flow and contaminant transport modeling. Designed as hands-on and application oriented. Covers the fundamental equations, numerical methods, and modeling techniques with emphasis on conceptual modeling and teaching students how to solve real world problems using an interactive groundwater modeling and visualization system. Specific topics include conceptual representations and grid design, selecting model boundaries, sources and sinks, profile models, special needs for transient simulations, calibration, verification, sensitivity analysis, and several hands-on projects on modeling groundwater contamination, well-field management, and remediation system. Also offered as CE 670 and may be taken only once for credit.

Prerequisite: CE 569/669.
CE 571 - Subsurface Contaminant Transport (4)
Principles associated with the transport and fate of contaminants in subsurface systems. Complex, heterogeneous factors and processes (both physical and geochemical) influencing contaminant transport. Emphasis on the impact of these processes on contaminant fate across the multitude of scales in the subsurface. Case studies linking theory and measured/observed transport behavior. Also offered as CE 671 and may be taken only once for credit. Prerequisite: graduate standing.

CE 572 - Environmental Fluid Mechanical Transport (4)
Introduction to the basic physical processes which transport pollutants in natural waters (rivers, lakes, reservoirs, estuaries); mathematical formulations of heat and mass advective and diffusive transport; descriptions of molecular diffusion, turbulent diffusion, and dispersion. Use of predictive mathematical models as a basis for water and air quality management. Also offered as CE 672 and may be taken only once for credit. Prerequisite: CE 361 and CE 371.

CE 573 - Numerical Methods in Environmental and Water Resources Engineering (4)
Introduction to the mathematical solution of partial differential equations by finite difference and finite element techniques. Development of solution approaches to water quality and hydraulic problems in surface and groundwater systems. Analysis of model sensitivities, calibration and verification. Also offered as CE 673 and may be taken only once for credit. Prerequisite: senior or graduate standing in civil or environmental engineering.

CE 574 - Unit Operations of Environmental Engineering (4)
Unit operations of water and wastewater treatment; pretreatment; sedimentation, filtration, aeration, disinfection, sludge treatment and disposal, advanced wastewater treatment processes. Also offered for undergraduate-level credit as CE 474 and may be taken only once for credit. Prerequisite: CE 371.

CE 576 - Environmental Fluid Mechanics (4)
Introduction to the fundamentals of the fluid dynamics of natural surface waters by analysis of the governing equations of mass, momentum, and heat conservation. Applications include turbulence modeling, finite depth water motions, stratified flow phenomena, and seiche phenomena. Also offered as CE 676 and may be taken only once for credit. Prerequisite: CE 361, CE 362 and CE 371.

CE 578 - Water Quality Modeling (4)
Introduction to descriptive modeling approaches for analyzing water quality changes in lakes, reservoirs, rivers, and estuaries. Applications include modeling dissolved oxygen, temperature, nutrients, and algal dynamics. Also offered as CE 678 and may be taken only once for credit. Prerequisite: EAS 361, CE 371.

CE 579 - Fate and Transport of Toxics in the Environment (4)
Chemical, physical, and biological principles that govern the behavior of toxic materials such as heavy metals and synthetic organic compounds in the environment. Course emphasizes practical ways to represent chemical processes in models of pollutant behavior. Topics include: adsorption of pollutants on soils and sediments; transport across sediment-water and air-water interfaces; bioamplification of pollutants; multiphase fugacity models of organics; case studies of contaminated surface water, sediment and groundwater. This is the same course as ESM 579; also offered for undergraduate-level credit as CE 479 and may be taken only once for credit. Prerequisite: senior or graduate standing. Crosslisted as: ESM 579.

CE 580 - Chemistry of Environmental Toxins (4)
The fate and transport-related behavior of toxic compounds in the environment. Classification, nomenclature, examples of anthropogenic compounds, and case studies. Introducing the physical and chemical processes associated with air-water exchange, organic-liquid exchange, sorption processes, chemical transformations, and bioaccumulation. Also offered for undergraduate-level credit as CE 480 and may be taken only once for credit. Prerequisite: CE 361 and CE 371.
CE 485 - Introduction to Environmental Fluid Mechanics (4)
Advanced introduction to the geophysical fluid flows, including properties of seawater; conservation of mass, energy and momentum; dimensional analysis; the the Navier-Stokes, Reynolds and turbulent kinetic energy equations; geostrophy and potential vorticity; long and short waves; and turbulence and boundary layers. Lecture and laboratory. Also offered for undergraduate-level credit as CE 489 and may be taken only once for credit.
Prerequisite: Minimum GPA 3.0, senior status or graduate level from all disciplines and majors.

CE 493 - Design and Operation of Bicycle Infrastructure (4)
Introduction to transportation engineering and planning applications in the Netherlands, focusing on pedestrian, bicycle and public transport. Contrasts between U.S. and Dutch engineering principles, policies and standards. Design principles and practice will be explored through field trips and guest lectures while abroad and in Portland. Faculty led study abroad course. Also offered for undergraduate-level credit as CE 495 and may be taken only once for credit.
Prerequisite: CE 486 and may be taken only once for credit.

CE 586 - Environmental Chemistry (4)
Survey of chemical aspects of major environmental issues: stratospheric ozone holes and chlorofluorocarbons; air pollution; global climate change; fossil fuel energy/"carbon footprint"; renewable energy; nuclear energy/radioactivity; toxic chemicals (pesticides, PCBs); endocrine disruptors; surfactants, chemical dispersants/oil spills; biodegradability of chemicals; chemistry of natural waters/acid rain; toxic heavy metals. Also offered for undergraduate-level credit as CE 486 and may be taken only once for credit. This is the same course as Ch 586 and can be taken only once for credit.
Prerequisite: Ch 334 or 331. Crosslisted as: Ch 586.

CE 587 - Aquatic Chemistry (4)
Aqueous chemistry in natural water systems: simple-to-complex acid/base chemistry; titration curves; buffer strength; acid/base chemistry of carbon dioxide in open and closed systems; alkalinity as system variable (blood); mineral dissolution/precipitation (metal carbonates); redox chemistry: pe-pH, redox succession/organic loading/dissolved oxygen loss, nitrate reduction, iron oxide dissolution, hydrogen sulfide production, methane formation. Also offered for undergraduate-level credit as CE 487 and may be taken only once for credit. This is the same course as Ch 587 and can be taken only once for credit.
Prerequisite: Ch 223 with a C- or better. Crosslisted as: Ch 587.

CE 588 - Air Quality (4)
An overview of urban air quality issues facing cities in the US and globally. Examine effects of air pollution on public health and environment, as well as technologies and regulatory practices. Review pollution measurement and modeling techniques. This course is the same as ESM 460/560; may only be taken once for credit. Expected preparation: CE 371.

Prerequisite: junior standing. Crosslisted as: ESM 560.

CE 589 - Introduction to Advanced Environmental Fluid Mechanics (4)
Advanced introduction to the geophysical fluid flows, including properties of seawater; conservation of mass, energy and momentum; dimensional analysis; the the Navier-Stokes, Reynolds and turbulent kinetic energy equations; geostrophy and potential vorticity; long and short waves; and turbulence and boundary layers. Lecture and laboratory. Also offered for undergraduate-level credit as CE 489 and may be taken only once for credit.
Prerequisite: EAS 215, Mth 256, CE 361, CE 362. Corequisite: CE 589L.
CE 589L - Lab for CE 589 (0)
Lab for CE 589.
Corequisite: CE 589.

CE 590 - Soil and Groundwater Restoration (4)
Methods for restoring contaminated soil and groundwater; Factors and processes influencing the efficacy of remediation systems. Emphasis on the scientific principles upon which soil and groundwater remediation is based. Containment, pump and treat, cosolvents and surfactants, soil venting, in-situ physical and chemical treatment. Also offered for undergraduate-level credit as CE 490 and may be taken only once for credit.
Prerequisite: senior/grad standing.

CE 593 - Design and Operation of Bicycle and Pedestrian Infrastructure (4)
Design and operational concepts in the engineering design of bicycle and pedestrian infrastructure. Course covers on-road and shared path locations. Specific topics include design details of bikeways, basic geometric design, intersection and signalization considerations, and ADA requirements supporting non-motorized modes. Also offered for undergraduate credit as CE 493 and may be taken only once for credit.

CE 595 - Sustainable Transportation in the Netherlands (5)
Introduction to transportation engineering and planning applications in the Netherlands, focusing on pedestrian, bicycle and public transport. Contrasts between U.S. and Dutch engineering principles, policies and standards. Design principles and practice will be explored through field trips and guest lectures while abroad and in Portland. Faculty led study abroad course. Also offered for undergraduate-level credit as CE 495 and may be taken only once for credit.
Prerequisite: Minimum GPA 3.0, senior status or graduate level from all disciplines and majors.

CE 601 - Research (1-9)
(Credit to be arranged.) Consent of instructor.

CE 603 - Dissertation (1-9)
(Credit to be arranged.) Consent of instructor.

CE 604 - Cooperative Education/Internship (1-9)
(Credit to be arranged.) Consent of instructor.

CE 605 - Reading and Conference (1-9)
(Credit to be arranged.) Consent of instructor.

CE 606 - Special Projects (1-9)
(Credit to be arranged.) Consent of instructor.

CE 607 - Seminar (1-9)
(Credit to be arranged.) Consent of instructor.

CE 610 - Selected Topics (1-9)
(Credit to be arranged.) Consent of instructor.

CE 618 - Prestressed Concrete Design (4)
Analysis and design of components of prestressed concrete structures with reference to current codes. Also offered as CE 518 and may be taken only once for credit.
Prerequisite: CE 435/535.

CE 624 - Matrix and Computer Methods in Structural Analysis (4)
Fundamental concepts of analysis for statically determinate and indeterminate structures utilizing matrices and computers; displacement and force methods applied to trusses and rigid frames; techniques for the
analysis of large complex structures for static and dynamic loads. Also offered as CE 524 and may be taken only once for credit. This is the first course in a sequence of two: CE 624 and CE 625.

Prerequisite: CE 325.

CE 626 - Theory of Plates (4)
Small and large deformation theories of thin plates; numerical and energy methods; free vibrations. Also offered as CE 526 and may be taken only once for credit.

Prerequisite: Mth 256.

CE 627 - Finite Elements in Structural Mechanics (4)
Principles of stiffness analysis of structures, essentials of the finite element formulation of elastic problems with applications to structural mechanics, plates and shells, and other related problems utilizing digital computers. Also offered as CE 527 and may be taken only once for credit. This is the first course in a sequence of two: CE 627 and CE 628.

Prerequisite: CE 524/624.

CE 628 - Finite Elements in Structural Mechanics (4)
Principles of stiffness analysis of structures, essentials of the finite element formulation of elastic problems with applications to structural mechanics, plates and shells, and other related problems utilizing digital computers. Also offered as CE 528 and may be taken only once for credit. This is the second course in a sequence of two: CE 627 and CE 628.

Prerequisite: CE 524/624.

CE 629 - Structural Dynamics (4)
Determination of normal modes and frequencies for structural systems. Transient and steady state response. Derivation and solution of governing equations using matrix formulation. Analysis of linear response of structures to dynamic loadings. Stresses and deflections in structures. Also offered as CE 529 and may be taken only once for credit.

Prerequisite: CE 423/523.

CE 634 - Advanced Reinforced Concrete Design (3)
Design of spandrel beams, slabs on beams, shear walls, deep beams, corbels, and other components of reinforced concrete structures with reference to current codes. Also offered as CE 534 and may be taken only once for credit.

Prerequisite: CE 435.

CE 637 - Earthquake Engineering (4)
Response of structures to ground motions; determination and use of response spectra; seismic design criteria and provisions for buildings and other structures; and review of current practices for earthquake resistant design. Also offered as CE 537 and may be taken only once for credit.

Prerequisite: CE 529/629.

CE 639 - Advanced Steel Design (4)
Analysis and design of metal structures including connections, plate girders, design loads, structural systems, and bracing. Also offered as CE 539 and may be taken only once for credit.

Prerequisite: CE 432/532.

CE 641 - Advanced Soil Mechanics (4)
Study of the advanced principles of soil behavior related to stress-strain, shear strength, permeability, and consolidation. Also offered as CE 541 and may be taken only once for credit.

Prerequisite: CE 444.

CE 644 - Advanced Shallow Foundation Design (4)
Advanced topics in settlement and bearing capacity analysis of shallow foundation; application of numerical schemes to foundation design. Also offered as CE 544 and may be taken only once for credit.

Prerequisite: CE 444.

CE 646 - Numerical Methods in Soil-Structure Interaction (4)
Application of finite difference and finite element methods to the solution of soil-structure problems, stability of soil masses and foundation installation. Use of commercial computer programs in working applied problems. Also offered as CE 546 and may be taken only once for credit.

Prerequisite: CE 444.

CE 649 - Deep Foundation Design and Analysis (4)
Comprehensive study of both driven and augered pile foundations, including concrete, steel, and timber. In-depth review of design methods for axial and lateral capacity. Special emphasis on the differences between driven piles and drilled shafts, including the role of full-scale load testing in the semi-empirical methods.
Introduction to group theory in elasticity and plasticity. Also offered as CE 549 and may be taken only once for credit.

Prerequisite: CE 444.

CE 661 - Water Resource Systems Analysis (4)
Application of quantitative techniques used in the analysis of water resource systems for planning, design and operation. Emphasis is placed on the physical, legal and economic aspects and their incorporation into simulation models. Applications include reservoir systems for water supply and hydropower, irrigation planning and operation, and water quality management.
Also offered as CE 561 and may be taken only once for credit.

Prerequisite: CE 464/564 or equivalent.

CE 666 - Environmental Data Analysis (4)
A development of quantitative techniques of exploratory data analysis, probability distributions, simple and multiple regression and their applications to analysis and modeling, and detection of changes and trends in environmental time series. Also offered as CE 566 and may be taken only once for credit.

Prerequisite: CE 668.

CE 668 - Advanced Methods in Hydrologic Systems Analysis (4)
Advanced topics in hydrologic systems with specific emphasis on hydrologic model building. Variety of techniques in hydrologic system analysis with mathematical formulation, development and use of computer-based models for solving scientific and engineering problems are discussed.
Among the topics presented will be the discussion of optimization theory, artificial intelligence, model calibration (parameter estimation), ensemble (probabilistic) forecasting, data assimilation and uncertainty analysis. Also offered as CE 568 and may be taken only once for credit. Recommended prerequisites: CE 465/565 or similar course.

**CE 670 - Groundwater Modeling (4)**

The objective is to give students a good introduction to practical groundwater flow and contaminant transport modeling. Designed as hands-on and application oriented. Covers the fundamental equations, numerical methods, and modeling techniques with emphasis on conceptual modeling and teaching students how to solve real world problems using an interactive groundwater modeling and visualization system. Specific topics include conceptual representations and grid design, selecting model boundaries, sources and sinks, profile models, special needs for transient simulations, calibration, verification, sensitivity analysis, and several hands-on projects on modeling groundwater contamination, well-field management, and remediation system. Also offered as CE 570 and may be taken only once for credit.

Prerequisite: CE 569/669.

**CE 671 - Subsurface Contaminant Transport (4)**

Principles associated with the transport and fate of contaminants in subsurface systems. Complex, heterogeneous factors and processes (both physical and geochemical) influencing contaminant transport. Emphasis on the impact of these processes on contaminant fate across the multitude of scales in the subsurface. Case studies linking theory and measured/observed transport behavior. Also offered as CE 571 and may be taken only once for credit.

Prerequisite: graduate standing.

**CE 672 - Environmental Fluid Mechanical Transport (4)**

Introduction to the basic physical processes which transport pollutants in natural waters (rivers, lakes, reservoirs, estuaries); mathematical formulations of heat and mass advective and diffusive transport; descriptions of molecular diffusion, turbulent diffusion, and dispersion. Use of predictive mathematical models as a basis for water and air quality management. Also offered as CE 572 and may be taken only once for credit.

Prerequisite: CE 361 and CE 371.

**CE 673 - Numerical Methods in Environmental and Water Resources Engineering (4)**

Introduction to the mathematical solution of partial differential equations by finite difference and finite element techniques. Development of solution approaches to water quality and hydraulic problems in surface and groundwater systems. Analysis of model sensitivities, calibration and verification. Also offered as CE 573 and may be taken only once for credit.

Prerequisite: senior or graduate standing in civil or environmental engineering.

**CE 676 - Environmental Fluid Mechanics (4)**

Introduction to the fundamentals of the fluid dynamics of natural surface waters by analysis of the governing equations of mass, momentum, and heat conservation. Applications include turbulence modeling, finite depth water motions, stratified flow phenomena, and seiche phenomena. Also offered as CE 576 and may be taken only once for credit.

Prerequisite: CE 361, CE 362 and CE 371.

**CE 678 - Water Quality Modeling (4)**

Introduction to descriptive modeling approaches for analyzing water quality changes in lakes, reservoirs, rivers, and estuaries. Applications include modeling dissolved oxygen, temperature, nutrients, and algal dynamics. Also offered as CE 578 and may be taken only once for credit.

Prerequisite: EAS 361, CE 371.

**CFS - Child & Family Studies**

**CFS 101 - Introduction to Child and Family Studies (2)**

Overview of the field of child and family studies, reviewing its historic development and the advantages of an interdisciplinary approach to studying children, youth, and families. Students will survey services that support children, youth, and families. Students will explore professional opportunities, careers choices, and professional organizations.

**CFS 312 - Human Development in the Family Setting (4)**

This course offers a deeper understanding of family life and its intersection with individual development across the lifespan. Life Course Theory will provide the foundation for understanding the dynamic experiences of families as we explore physical, social/emotional, and cognitive development from birth to death. Students will have the opportunity to critically process developmental theories through lecture, discussion, videos, and assignments. There will be a focus on issues of diversity, anti-oppression, and social justice.

Prerequisite: junior standing.

**CFS 312U - Human Development in the Family Setting (4)**

This course offers a deeper understanding of family life and its intersection with individual development across the lifespan. Life Course Theory will provide the foundation for understanding the dynamic experiences of families as we explore physical, social/emotional, and cognitive development from birth to death. Students will have the opportunity to critically process developmental theories through lecture, discussion, videos, and assignments. There will be a focus on issues of diversity, anti-oppression, and social justice.

Prerequisite: junior standing.

**CFS 320 - ABCs of Early Childhood Education (4)**

An introductory class for students preparing for parenthood or interested in careers in early childhood education. History and philosophy; observation processes; guidance approaches; and program assessment.

**CFS 320U - ABCs of Early Childhood Education (4)**

An introductory class for students preparing for parenthood or interested in careers in early childhood education. History and philosophy; observation processes; guidance approaches; and program assessment.

**CFS 330 - American Families in Film and Television (4)**

Examines portrayals of American families in film and television over time, including the effect of film and television portrayals on expectations around such family issues as gender roles, conflict resolution, parenting,
and traditions. Exposes students to film and media criticism and highlights issues of inclusion/exclusion in family portrayals.

CFS 330U - American Families in Film and Television (4)
Examines portrayals of American families in film and television over time, including the effect of film and television portrayals on expectations around such family issues as gender roles, conflict resolution, parenting, and traditions. Exposes students to film and media criticism and highlights issues of inclusion/exclusion in family portrayals.

CFS 340 - Queer Families (4)
Explores and investigates issues facing lesbian, gay, bisexual, and transgender (LGBT) families, including all relationships in which primary care-giving responsibilities are shared by individuals who are interdependent upon each other, including conjugal and non-conjugal relationships. We will consider LGBT families and their cultural, political, gender, racial, and economic dimensions.

CFS 340U - Queer Families (4)
Explores and investigates issues facing lesbian, gay, bisexual, and transgender (LGBT) families, including all relationships in which primary care-giving responsibilities are shared by individuals who are interdependent upon each other, including conjugal and non-conjugal relationships. We will consider LGBT families and their cultural, political, gender, racial, and economic dimensions.

CFS 350 - Interpersonal Violence: Impact on Children & Families (4)
Focuses on interpersonal violence (IPV) and its impacts on children, including developmental implications of witnessing IPV from birth to adulthood, and the behavioral, social, and emotional effects of exposure to violence. Prepares students to identify tactics of violence, assess children’s exposure to IPV, and respond through prevention and early intervention.

CFS 350U - Interpersonal Violence: Impact on Children & Families (4)
Focuses on interpersonal violence (IPV) and its impacts on children, including developmental implications of witnessing IPV from birth to adulthood, and the behavioral, social, and emotional effects of exposure to IPV, and respond through prevention and early intervention.

CFS 382 - Mental Disorders: Issues for Families and Communities (4)
Explores the etiology of mental and emotional disorders and the impact on individuals, their families and communities. The course emphasizes current social, cultural and political forces affecting individuals and families, and factors that contribute to resilience and recovery. The course includes a community-based learning component.

Prerequisite: junior standing.

CFS 382U - Mental Disorders: Issues for Families and Communities (4)
Explores the etiology of mental and emotional disorders and the impact on individuals, their families and communities. The course emphasizes current social, cultural and political forces affecting individuals and families, and factors that contribute to resilience and recovery. The course includes a community-based learning component.

Prerequisite: junior standing.

CFS 385 - Working with Diverse Families (4)
For individuals who are preparing to work professionally with families. Theoretical perspectives on working with families. Issues involved when working with diverse U.S. families (African American, Asian, Russian, and Hispanic) as well as international families.

CFS 385U - Working with Diverse Families (4)
For individuals who are preparing to work professionally with families. Theoretical perspectives on working with families. Issues involved when working with diverse U.S. families (African American, Asian, Russian, and Hispanic) as well as international families.

Prerequisite: junior standing.

CFS 390 - Sex and the Family (4)
Explores how responses to sexuality are influenced by family and other social systems including culture, gender, economics, and religion. Family systems theory will be used to evaluate family relationships.

Prerequisite: junior standing.

CFS 390U - Sex and the Family (4)
Explores how responses to sexuality are influenced by family and other social systems including culture, gender, economics, and religion. Family systems theory will be used to evaluate family relationships.

Prerequisite: junior standing.

CFS 393 - Community Resources and Family Support (4)
Examination of community resources in the context of community building, family support and empowerment, cultural competence, and cultural democracy. Factors that influence the effectiveness of community programs serving children and families. The mission, professional roles, and services of particular community agencies and programs that serve, support, and/or advocate on behalf of children and families.

Prerequisite: junior standing.

CFS 393U - Community Resources and Family Support (4)
Examination of community resources in the context of community building, family support and empowerment, cultural competence, and cultural democracy. Factors that influence the effectiveness of community programs serving children and families. The mission, professional roles, and services of particular community agencies and programs that serve, support, and/or advocate on behalf of children and families.

Prerequisite: junior standing.

CFS 399 - Special Studies (1-4)
(Credit to be arranged.)

CFS 399U - Special Studies (4)
(Credit to be arranged.)

CFS 401 - Research (1-8)
(Credit to be arranged.)

CFS 404 - Cooperative Education/Internship (1-12)
(Credit to be arranged.)

CFS 405 - Reading and Conference (1-8)
(Credit to be arranged.)
CFS 406 - Projects (1-8)  
(Credit to be arranged.)

CFS 407 - Seminar (1-12)  
(Credit to be arranged.)

CFS 408 - Workshop (1-4)  
(Credit to be arranged.)

CFS 409 - Practicum (0-12)  
(Credit to be arranged.) Supervised community-based learning experience in organizations and agencies that serve children and families. One credit equals 30 hours. Includes reflective, integrative seminar. Prerequisite: CFS 494.

CFS 410 - Selected Topics (1-8)  
(Credit to be arranged.)

CFS 410U - Selected Topics (4)  
(Credit to be arranged.)

CFS 450 - Youth and Youth Work (4)  
Emphasizes multiple lenses through which young people are seen and treated. Explores youth work principles, multiple youth work traditions, experiential/outdoor education, youth development, and other dimensions of youth work. Includes community-based component for application of theory. Intended for students planning careers in education, policy, and direct service with youth. Required course for Child Family Studies Youth Worker specialization. Graduate students will participate in one hour of additional class time per week, to be scheduled with the instructor at the first class session. Prerequisite: junior standing.

CFS 480 - Societal Influences on Professional Practice (4)  
Individuals preparing for human or social services professions have been influenced by family and societal events, values, beliefs, and assumptions which have interacted with their lives. Students will examine those influences (including gender, culture, and socioeconomic status) for the purpose of gaining insight into the ways their professional practice might be affected. Projects will include a professional practice action plan.

CFS 481 - Family Health Issues (4)  
Overview of issues related to family health, including health promotion/prevention domestic violence/child abuse, alcohol/chemical dependence, chronic and terminal illnesses, and accessing health systems. Special attention to ethnic, political, ideological, religious, economic, and geographic influences. Includes community-based learning components. Prerequisite: junior standing.

CFS 481U - Family Health Issues (4)  
Overview of issues related to family health, including health promotion/prevention domestic violence/child abuse, alcohol/chemical dependence, chronic and terminal illnesses, and accessing health systems. Special attention to ethnic, political, ideological, religious, economic, and geographic influences. Includes community-based learning components. Prerequisite: junior standing.

CFS 482 - Parent and Family Education (4)  
Introduction to parenting rights, responsibilities, practices, processes, parent/child relationships, changing parenting roles and general philosophy/broad principles of family life education. Planning, observing, and evaluating family life education programs will be included through a community-based experience. Recommended prerequisite: junior status.

CFS 488 - Social Justice in Child and Family Studies (4)  
Examines and applies principles of anti-oppressive practice (AOP) in the helping professions served by students with degrees in Child and Family Studies. The course will present theoretical foundations for AOP grounded in discussions of power and privilege, voice, marginalization and oppression, and the role of the helping professional in working to transform oppressive social structures, values, and behaviors. Prerequisite: CFS 480 and junior standing.

CFS 491 - Conceptual Foundations in Child and Family Studies (4)  
Theoretical and conceptual foundations of working with children, youth, and families in professional settings. Historical, socio-political contexts of significant theories and their relevance for professional application. Prerequisite: junior standing.

CFS 492 - Families and the State: Effects of Legislation and Policies on Children and Family (4)  
Laws and policies that influence the well-being of families, youth, and children will be examined from a historical, socio-political perspective. Analysis of contextual influences and community-based learning experience will assist students in practical applications related to

CFS 494 - Professional Development in Child and Family Studies I (3)  
Students will begin the process of documenting their achievement of the first CFS Learning Outcome as they establish the foundation of the CFS Professional Portfolio. The history and development of female-intensive professions, professionalization, ethical decision-making, and the creation and use of theoretical knowledge will also be a focus. Prerequisite: Admittance into the Child and Family Studies Program.

CFS 495 - Professional Development in Child and Family Studies II (1)  
Continued examination of interdisciplinary perspectives and the ways in which personal development, professional identity, and professional action contribute to professional development. Emphasis will be on reflective practice, professional ethics, professional boundaries, professionalization processes, legislation, and advocacy. Prerequisite: CFS 494.

CFS 496 - Professional Development in Child and Family Studies III (2)  
Students will complete their CFS Professional Portfolio as they document their achievement of the final CFS Learning Outcomes. They will consider the relationship between person and professional ethical decisions, the role of change agents in society, and attend a professional organization meeting. Prerequisite: CFS 495.

CFS 497 - Practicum I (5)  
Child and Family Studies practicum conducted in approved professional settings...
with consideration for students' professional goals.

Prerequisite: Junior standing, admittance to Child and Family Studies Program, grade of IP in CFS 494.

CFS 498 - Practicum II (5)

Child and Family Studies practicum conducted in approved professional settings selected with consideration of students' professional goals. Accompanying seminar.

Prerequisite: Admittance into the CFS program, five credits of CFS 497 (Practicum I) senior status, and CFS 480 (completion or concurrent registration).

CFS 501 - Research (1-9)

(Credit to be arranged.)

CFS 505 - Reading and Conference (1-6)

(Credit to be arranged.)

CFS 550 - Youth and Youth Work (4)

Emphasizes multiple lenses through which young people are seen and treated. Explores youth work principles, multiple youth work traditions, experiential/outdoor education, youth development, and other dimensions of youth work. Includes community-based component for application of theory.

Intended for students planning careers in education, policy, and direct service with youth. Required course for Child Family Studies Youth Worker specialization.

Graduate students will participate in one hour of additional class time per week, to be scheduled with the instructor at the first class session.

Prerequisite: Junior standing.

CFS 580 - Societal Influences on Professional Practice (4)

Individuals preparing for human or social services professions have been influenced by family and societal events, values, beliefs, and assumptions which have interacted with their lives. Students will examine those influences (including gender, culture, and socioeconomic status) for the purpose of gaining insight into the ways their professional practice might be affected. Projects will include a professional practice action plan.

CFS 586 - Parent and Family Education (4)

Introduction to parenting rights, responsibilities, practices, processes, parent/child relationships, changing parenting roles and general philosophy/broad principles of family life education. Planning, observing, and evaluating family life education programs will be included through a community based experience. Recommended prerequisite: Junior status.

CFS 591 - Conceptual Foundations in Child and Family Studies (4)

Theoretical and conceptual foundations of working with children, youth, and families in professional settings. Historical, sociopolitical contexts of significant theories and their relevance for professional application.

Prerequisite: Junior standing.

Ch - Chemistry

Ch 104 - Introductory Chemistry I (4)

A survey of chemistry for students in nursing, in allied health fields such as dental hygiene, in forestry, and in the liberal arts. This course is not intended for science or engineering majors. This is the first course in a sequence of three: Ch 104, Ch 105 and Ch 106 which must be taken in sequence. Ch 104 - Ch 109 does not satisfy the first-year Chemistry requirement for most science and engineering majors.

Ch 105 - Introductory Chemistry II (4)

A survey of chemistry for students in nursing, in allied health fields such as dental hygiene, in forestry, and in the liberal arts. This course is not intended for science or engineering majors. This is the second course in a sequence of three: Ch 104, Ch 105 and Ch 106 which must be taken in sequence. Ch 104 - Ch 109 does not satisfy the first-year Chemistry requirement for most science and engineering majors.

Ch 106 - Introductory Chemistry III (4)

A survey of chemistry for students in nursing, in allied health fields such as dental hygiene, in forestry, and in the liberal arts. This course is not intended for science or engineering majors. This is the third course in a sequence of three: Ch 104, Ch 105 and Ch 106 which must be taken in sequence. Ch 104 - Ch 109 does not satisfy the first-year Chemistry requirement for most science and engineering majors.
Ch 221 - General Chemistry I (4)
Fundamental basis of chemistry for science, engineering and health professional students (such as pre dental, premedical, premedical technology and veterinary students). Concurrent enrollment in Ch 227 for Ch 221, Ch 228 for Ch 222, and Ch 229 for Ch 223 is recommended. This is the first course in a sequence of three: Ch 221, Ch 222, and Ch 223. Ch 104 - Ch 109 does not satisfy the first-year Chemistry requirement for most science and engineering majors.

Ch 221H - Honors General Chemistry I
Honors General Chemistry will address the topics of general chemistry with a focus on the urban context and the principles of green chemistry. The course is designed to challenge well-prepared students and will utilize alternative modes of instruction in smaller class sizes. Students will work in groups to address real world problems with the guidance of the lecture instructor. The course is limited to students admitted to the University Honors Program. Students should have taken at least one year of high-school chemistry.
Corequisite: Ch 227H.

Ch 222 - General Chemistry II (4)
Fundamental basis of chemistry for science, engineering and health professional students (such as pre dental, premedical, premedical technology and veterinary students). Concurrent enrollment in Ch 227 for Ch 221, Ch 228 for Ch 222, and Ch 229 for Ch 223 is recommended. This is the second course in a sequence of three: Ch 221, Ch 222, and Ch 223. Ch 104 - Ch 109 does not satisfy the first-year Chemistry requirement for most science and engineering majors.

Ch 222H - Honors General Chemistry II
Honors General Chemistry will address the topics of general chemistry with a focus on the urban context and the principles of green chemistry. The course is designed to challenge well-prepared students and will utilize alternative modes of instruction in smaller class sizes. Students will work in groups to address real world problems with the guidance of the lecture instructor. The course is limited to students admitted to the University Honors Program. Students should have taken at least one year of high-school chemistry.
Corequisite: Ch 227H.

Ch 223 - General Chemistry III (4)
Fundamental basis of chemistry for science, engineering and health professional students (such as pre dental, premedical, premedical technology and veterinary students). Concurrent enrollment in Ch 227 for Ch 221, Ch 228 for Ch 222, and Ch 229 for Ch 223 is recommended. This is the third course in a sequence of three: Ch 221, Ch 222, and Ch 223. Ch 104 - Ch 109 does not satisfy the first-year Chemistry requirement for most science and engineering majors.

Ch 223H - Honors General Chemistry III
Honors General Chemistry will address the topics of general chemistry with a focus on the urban context and the principles of green chemistry. The course is designed to challenge well-prepared students and will utilize alternative modes of instruction in smaller class sizes. Students will work in groups to address real world problems with the guidance of the lecture instructor. The course is limited to students admitted to the University Honors Program. Students should have taken at least one year of high-school chemistry.
Corequisite: Ch 229H.

Ch 227 - General Chemistry Laboratory (1)
Laboratory work to accompany General Chemistry (Ch 221, 222, 223). Concurrent enrollment in the appropriate lecture course is recommended. One 3-hour laboratory. Pass/no pass only. This is the first lab in a sequence of three: Ch 227, Ch 228, and Ch 229.

Ch 227H - Honors Lab for Ch 221H
Laboratory work to accompany Honors General Chemistry (Ch 221H, 222H, 223H). Completion of or concurrent enrollment in lecture required. One 3-hour laboratory. Pass/no pass only.
Corequisite: Ch 221H.

Ch 228 - General Chemistry Laboratory (1)
Laboratory work to accompany General Chemistry (Ch 221, 222, 223). Concurrent enrollment in the appropriate lecture course is recommended. One 3-hour laboratory. Pass/no pass only. This is the second lab in a sequence of three: Ch 227, Ch 228, and Ch 229.
Corequisite: Ch 222.

Ch 228H - Honors Lab for Ch 222H
Laboratory work to accompany Honors General Chemistry (Ch 221H, 222H, 223H). Completion of or concurrent enrollment in lecture required. One 3-hour laboratory. Pass/no pass only.
Corequisite: Ch 222H.

Ch 229 - General Chemistry Laboratory (1)
Laboratory work to accompany General Chemistry (Ch 221, 222, 223). Concurrent enrollment in the appropriate lecture course is recommended. One 3-hour laboratory. Pass/no pass only. This is the third lab in a sequence of three: Ch 227, Ch 228, and Ch 229.

Ch 229H - Honors Lab for Ch 223H
Laboratory work to accompany Honors General Chemistry (Ch 221H, 222H, 223H). Completion of or concurrent enrollment in lecture required. One 3-hour laboratory. Pass/no pass only.
Corequisite: Ch 223H.

Ch 250 - Nutrition (4)
Nutritive value of foods from the standpoint of newer scientific investigations; nutritional requirements for normal human beings; selection of an optimal diet for health; present-day problems in nutrition; recent trends in American dietary habits.

Ch 284 - General Chemistry Workshop I (1)
Optional peer-led problem-solving sessions designed to promote the success of students in Ch 221, 222, 223 general chemistry sequence. Corequisite: corresponding lecture course Ch 221, 222, 223. Pass/no pass only. This is the first course in a sequence of three: Ch 284, Ch 285, and Ch 286.
Corequisite: Ch 221.

Ch 285 - General Chemistry Workshop II (1)
Optional peer-led problem-solving sessions designed to promote the success of students in Ch 221, 222, 223 general chemistry sequence. Corequisite: corresponding lecture course Ch 221, 222, 223. Pass/no pass only. This is the second course in a sequence of three: Ch 284, Ch 285, and Ch 286.
Corequisite: Ch 222.
Ch 286 - General Chemistry Workshop III (1)
Optional peer-led problem-solving sessions designed to promote the success of students in Ch 221, 222, 223 general chemistry sequence. Corequisite: corresponding lecture course Ch 221, 222, 223. Pass/no pass only. This is the third course in a sequence of three: Ch 284, Ch 285, and Ch 286.
Corequisite: Ch 223.

Ch 299 - Special Studies (1-6)
(Credit to be arranged.)

Ch 320 - Quantitative Analysis (4)
Fundamental principles of quantitative analytical chemistry. Recommended prerequisites: Ch 223 and 229.

Ch 321 - Quantitative Analysis Laboratory (2)
Basic quantitative analytical laboratory work including volumetric and instrumental methods. Recommended prerequisites: Ch 320 or concurrent enrollment.

Ch 327 - Elements of Organic Chemistry Laboratories I (2)
Laboratory work to accompany the sequence of Ch 331, 332. One 4-hour laboratory period. Recommended prerequisites for Ch 328: Ch 327. Concurrent enrollment in Ch 331 or 332 respectively is recommended.

Ch 328 - Elements of Organic Chemistry Laboratories II (2)
Laboratory work to accompany the sequence of Ch 331, 332. One 4-hour laboratory period. Recommended prerequisites for Ch 328: Ch 327. Concurrent enrollment in Ch 331 or 332 respectively is recommended.

Ch 331 - Elements of Organic Chemistry I (4)
Chemistry of the carbon compounds, the aliphatics, aromatics, and derivatives. The corresponding laboratory courses are Ch 327, 328. This is the first course in a sequence of two: Ch 331 and Ch 332. Recommended prerequisites for Ch 331: Ch 223; concurrent enrollment in Ch 327 is recommended. Recommended prerequisites for Ch 332: Ch 331; concurrent enrollment in Ch 328 is recommended.

Ch 332 - Elements of Organic Chemistry II (4)
Chemistry of the carbon compounds, the aliphatics, aromatics, and derivatives. The corresponding laboratory courses are Ch 327, 328. This is the second course in a sequence of two: Ch 331 and Ch 332. Recommended prerequisites for Ch 331: Ch 223; concurrent enrollment in Ch 327 is recommended. Recommended prerequisites for Ch 332: Ch 331; concurrent enrollment in Ch 328 is recommended.

Ch 334 - Organic Chemistry I (4)
A comprehensive study of the chemistry of the compounds of carbon. Meets chemistry and biochemistry major requirements. The corresponding laboratory courses are Ch 337, 339 for chemistry and biochemistry majors, and Ch 337, 338 for non-chemistry majors. This is the first course in a sequence of three: Ch 334, Ch 335, and Ch 336. Recommended prerequisites: Ch 223. Concurrent enrollment in the laboratory course is recommended.

Ch 335 - Organic Chemistry II (4)
A comprehensive study of the chemistry of the compounds of carbon. Meets chemistry and biochemistry major requirements. The corresponding laboratory courses are Ch 337, 339 for chemistry and biochemistry majors, and Ch 337, 338 for non-chemistry majors. This is the second course in a sequence of three: Ch 334, Ch 335, and Ch 336. Recommended prerequisites: Ch 223. Concurrent enrollment in the laboratory course is recommended.

Ch 336 - Organic Chemistry III (4)
A comprehensive study of the chemistry of the compounds of carbon. Meets chemistry and biochemistry major requirements. The corresponding laboratory courses are Ch 337, 339 for chemistry and biochemistry majors, and Ch 337, 338 for non-chemistry majors. This is the third course in a sequence of three: Ch 334, Ch 335, and Ch 336. Recommended prerequisites: Ch 223. Concurrent enrollment in the laboratory course is recommended.

Ch 337 - Organic Chemistry Laboratory I (2)
Part one of the laboratory work to accompany the sequence of Ch 334, Ch 335, Ch 336. One 4-hour laboratory period.

Ch 338 - Organic Chemistry Laboratory II (nonmajors) (2)
Part two of the laboratory work to accompany the sequence Ch 334, Ch 335, Ch 336. One 4-hour laboratory period. Not open to chemistry majors.
Prerequisite: Ch 337 and Ch 335 or concurrent enrollment in Ch 335.

Ch 339 - Organic Chemistry Laboratory II (chem majors) (3)
Part two of the laboratory work to accompany the sequence Ch 334, Ch 335, Ch 336. More extensive laboratory course than Ch 338; required for chemistry and biochemistry majors. Two 4-hour laboratory periods.
Prerequisite: Ch 337 and Ch 336 or concurrent enrollment in Ch 336.

Ch 350 - Biochemistry (4)
Biochemistry for students having a limited background in physical chemistry. Recommended prerequisites: Ch 229 and 332 or 336.

Ch 360 - Origins of Life on Earth (4)
Scientific description of the chemical events leading to life on the Earth. Current and past theories of how life arose and experiments that support these ideas will be presented. Cultural and societal issues surrounding the origins of life will also be discussed.

Ch 360U - Origins of Life on Earth (4)
Scientific description of the chemical events leading to life on the Earth. Current and past theories of how life arose and experiments that support these ideas will be presented. Cultural and societal issues surrounding the origins of life will also be discussed. Recommended prerequisites: one college-level course in biology, chemistry, geology, or physics.

Ch 384 - Organic Chemistry Workshop I (1)
Optional peer-led problem-solving sessions designed to promote the success of students in Ch 334, 335, 336 organic chemistry sequence. Corequisite: corresponding lecture course Ch 334, 335, 336. Pass/no pass only. This is the first course in a sequence of three: Ch 384, Ch 385, and Ch 386.
Ch 385 - Organic Chemistry Workshop II (1)
Optional peer-led problem-solving sessions designed to promote the success of students in Ch 334, 335, 336 organic chemistry sequence. Corequisite: corresponding lecture course Ch 334, 335, 336. Pass/no pass only. This is the second course in a sequence of three: Ch 384, Ch 385, and Ch 386.
Corequisite: Ch 335.

Ch 386 - Organic Chemistry Workshop III (1)
Optional peer-led problem-solving sessions designed to promote the success of students in Ch 334, 335, 336 organic chemistry sequence. Corequisite: corresponding lecture course Ch 334, 335, 336. Pass/no pass only. This is the third course in a sequence of three: Ch 384, Ch 385, and Ch 386.
Corequisite: Ch 336.

Ch 399 - Special Studies (1-6)
See department for course description. (Credit to be arranged.)

Ch 399U - Special Studies (4)
(Credit to be arranged.)

Ch 401 - Research (0-6)
Consent of instructor and chair of department. Credit will only be awarded after filing in the department office a well-written, detailed report approved by the instructor and the department chair. Ch 501 pass/no pass only. (Credit to be arranged.)

Ch 403 - Seminar (1-6)
Consent of instructor and chair of department. (Credit to be arranged.)

Ch 407 - Workshop Leader (1-3)
Optional peer-led problem-solving sessions designed to promote the success of students in Chemistry. Corequisite: corresponding lecture course. Pass/no pass only.

Ch 410 - Selected Topics (1-6)
Consent of instructor and chair of department. (Credit to be arranged.)

Ch 411 - Advanced Inorganic Chemistry I (4)
Atomic orbitals, ionic bonding, valence bond theory, molecular orbital theory, crystal field theory, and introduction to coordination theory. Also offered for graduate-level credit as Ch 511 and may be taken only once for credit.
Prerequisite: Ch 223.

Ch 412 - Advanced Inorganic Chemistry II (4)
Ligand field theory, coordination chemistry, transition metals, organometallic chemistry, acids and bases, nonaqueous solvents, and descriptive chemistry of the elements. Also offered for graduate-level credit as Ch 512 and may be taken only once for credit.
Prerequisite: Ch 411. Recommended prerequisites: Ch 442.

Ch 417 - Physical Chemistry for the Biosciences II (4)
Intended primarily for students in the biological sciences and allied medical health fields. The emphasis is on the application of modern physical chemistry to problems of biological interest. Ch 416 includes the study of heat, work, energy, entropy, vapor pressure, chemical equilibrium, and transport phenomena. Ch 417 covers chemical and enzyme kinetics, quantum chemistry, photochemistry, and spectroscopy. Courses must be taken in sequence. Recommended prerequisite: Ch 320, 321, a year of general physics with calculus, and two terms of calculus. Recommended prerequisites: Ch 223 and Ch 229.

Ch 418 - Advanced Chemistry Laboratory (4)
Advanced techniques and their use in the preparation of compounds. One lecture; two 3-hour laboratory periods. Also offered for graduate-level credit as Ch 518 and may be taken only once for credit. Expected preparation: Ch 336 or 339.

Ch 424 - Electronics and Instrumentation for Chemists (2)
Selected topics in chemical instrumentation will be presented at a basic level. Representative topics are current and voltage measurements, voltage dividers, simple filters, introduction to operational amplifiers and digital circuits. Requires concurrent enrollment in Ch 425/525. Also offered for graduate-level credit as Ch 524 and may be taken only once for credit. Expected preparation: Ch 320, Ch 321, Ph 203, and Ch 416 or Ch 440/540.

Ch 425 - Electronics and Instrumentation Laboratory (3)
Laboratory work to accompany Ch 424/524. Two 3-hour lab periods. Requires concurrent enrollment in Ch 424/524. Also offered for graduate-level credit as Ch 525 and may be taken only once for credit.

Ch 426 - Instrumental Analysis (4)
Theory and application of modern instrumental methods, including UV-visible, fluorescence, atomic absorption and emission, infrared, nuclear magnetic resonance, and mass spectrometry; potentiometry and voltammetry; gas and liquid chromatography, and capillary electrophoresis. Also offered for graduate-
level credit as Ch 526 and may be taken only once for credit.

Ch 427 - Instrumental Analysis Laboratory (4)
Laboratory work to accompany Ch 426, including electrochemistry, chromatography, and atomic and molecular spectroscopy instruments. Writing intensive course. One 5-hour laboratory period, two 2-hour recitations. Also offered for graduate-level credit as Ch 527 and may be taken only once for credit.

Ch 430 - Advanced Organic Chemistry (4)
Advanced treatment of general organic reactions and structure; emphasis on bonding, stereochemistry, the correlation of structure and reactivity, scope and mechanisms of organic reactions classified by reaction type. This is the first course in a sequence of two: Ch 430 and Ch 431. Also offered for graduate credit as Ch 530 and may be taken only once for credit. Expected preparation: Ch 336, 442/542, or 417/517.

Ch 431 - Advanced Organic Chemistry (4)
Advanced treatment of general organic reactions and structure; emphasis on bonding, stereochemistry, the correlation of structure and reactivity, scope and mechanisms of organic reactions classified by reaction type. This is the second course in a sequence of two: Ch 430 and Ch 431. Also offered for graduate credit as Ch 530 and may be taken only once for credit. Expected preparation: Ch 336, 442/542, or 417/517.

Ch 435 - Polymer Chemistry (4)
Fundamentals of polymers. Topics include polymer structures, molecular weights and determination, methods of polymerization including kinetics and statistics, testing and spectroscopy characterization of polymers, polymer composites and fillers, polymer reactions. Also offered for graduate-level credit as Ch 535 and may be taken only once for credit.

Prerequisite: Ch 336.

Ch 436 - Spectrometric Analysis (3)
Ultraviolet, infrared, nuclear magnetic resonance and mass spectrometry in the analysis of molecular structure. Also offered for graduate-level credit as Ch 536 and may be taken only once for credit. Expected preparation: Ch 336 and Ch 339.

Ch 437 - Spectrometric Analysis Laboratory (1)
Use of infrared spectrometers and nuclear magnetic resonance spectrometers. One 3-hour laboratory period. Also offered for graduate-level credit as Ch 537 and may be taken only once for credit. Expected preparation: Ch 436/536 or concurrent enrollment.

Ch 440 - Physical Chemistry I (4)
The study of thermodynamics, phase and chemical equilibria, solutions, electrochemistry, reaction rates and mechanisms, quantum mechanics, spectroscopy, electron transport, molecular modeling and statistical mechanics. This is the first course in a sequence of three: Ch 440, Ch 441, and Ch 442. Also offered for graduate-level credit as Ch 540 and may be taken only once for credit. Expected preparation: Ch 320, Ph 213, and Mth 253.

Ch 441 - Physical Chemistry II (4)
The study of thermodynamics, phase and chemical equilibria, solutions, electrochemistry, reaction rates and mechanisms, quantum mechanics, spectroscopy, electron transport, molecular modeling and statistical mechanics. This is the second course in a sequence of three: Ch 440, Ch 441, and Ch 442. Also offered for graduate-level credit as Ch 541 and may be taken only once for credit. Expected preparation: Ch 320, Ph 213, and Mth 253.

Ch 442 - Physical Chemistry III (4)
The study of thermodynamics, phase and chemical equilibria, solutions, electrochemistry, reaction rates and mechanisms, quantum mechanics, spectroscopy, electron transport, molecular modeling and statistical mechanics. This is the third course in a sequence of three: Ch 440, Ch 441, and Ch 442. Also offered for graduate-level credit as Ch 542 and may be taken only once for credit. Expected preparation: Ch 320, Ph 213, and Mth 253.

Ch 443 - Numerical Data Analysis and Modeling in Chemistry (2)
The study of statistical analysis of experimental data and modeling of chemical systems using modern computational resources. Also offered for graduate-level credit as Ch 543 and may be taken only once for credit.

Prerequisite: Ch 336 and Ch 339.

Ch 444 - Physical Chemistry Laboratory (2)
Laboratory work to accompany Ch 441/541, 442/542. One 4-hour laboratory period. This is the first lab in a sequence of two: Ch 444 and Ch 445. Also offered for graduate-level credit as Ch 544 and may be taken only once for credit. Expected preparation: Ch 320 and concurrent enrollment in Ch 441/541, 442/542 respectively.

Ch 445 - Physical Chemistry Laboratory (2)
Laboratory work to accompany Ch 441/541, 442/542. One 4-hour laboratory period. This is the second lab in a sequence of two: Ch 444 and Ch 445. Also offered for graduate-level credit as Ch 545 and may be taken only once for credit. Expected preparation: Ch 320 and concurrent enrollment in Ch 441/541, 442/542 respectively.

Ch 451 - Materials Chemistry Laboratory (3)
A suite of laboratory experiments in modern materials chemistry. Topics include nonmolecular inorganic solids (semiconductors, superconductors, sols, and gels), thin polymeric films, magnetic and photonic materials. Equal emphasis is placed on synthesis and physical characterization. Also offered for graduate-level credit as Ch 551 and may be taken only once for credit. Expected preparation: Ch 338 or Ch 339.

Ch 460 - Prebiotic Chemistry (4)
Reaction pathways for the abiological production of molecules involved in biological information flow. Also offered for graduate-level credit as Ch 560 and may be taken only once for credit. Expected Preparation: completion or concurrent enrollment in Ch 492/592.

Ch 470 - NMR Spectroscopy (4)
Nuclear magnetic resonance spectroscopy theory and practice. Basic quantum theory of magnetic moments, the semi-classical vector model of spins, and the product operator formalism will be applied using a variety of NMR spectroscopic techniques. Also offered for graduate-level credit as Ch 570 and may be taken only once for credit. Expected preparation: Ch 417 or Ch 442.
Ch 471 - Biological NMR Spectroscopy (4)
Nuclear magnetic resonance spectroscopy (NMR) of biological systems. The basic theory of NMR, its application to complex biological molecules and complexes. Also offered for graduate-level credit as Ch 571 and may be taken only once for credit. Expected preparation: Ch 470/570.

Ch 486 - Environmental Chemistry (4)
Survey of chemical aspects of major environmental issues: stratospheric ozone holes and chlorofluorocarbons; air pollution; global climate change; fossil fuel energy; carbon footprint; renewable energy; nuclear energy; radioactivity; toxic chemicals (pesticides, PCBs); endocrine disruptors; surfactants; chemical dispersants/oil spills; biodegradability of chemicals; chemistry of natural waters/acid rain; toxic heavy metals. This is the same course as CE 486 and can be taken only once for credit.
Prerequisite: Ch 334 or Ch 331. Crosslisted as: CE 486.

Ch 487 - Aquatic Chemistry (4)
Aqueous chemistry in natural water systems: simple-to-complex acid/base chemistry; titration curves; buffer strength; acid/base chemistry of carbon dioxide in open and closed systems; alkalinity as system variable (blood); mineral dissolution/precipitation (metal carbonates); redox chemistry: pe-pH, redox succession/organic loading/dissolved oxygen loss, nitrate reduction, iron oxide dissolution, hydrogen sulfide production, methane formation. This is the same course as CE 487 and can be taken only once for credit.
Prerequisite: Ch 223. Crosslisted as: CE 487.

Ch 490 - Biochemistry: Structure and Function (4)
First term of a three-term course for students preparing for professional biochemical work. Structures of biological molecules and assemblies, including proteins, nucleic acids, and lipids, and how these structures give rise to their biological functions. Also offered for graduate-level credit as Ch 590 and may be taken only once for credit. Expected preparation: Ch 336. Recommended pre- or corequisites: Ch 416 or Ch 440/540, Ch 320/321, and Bi 253.

Ch 491 - Biochemistry: Enzymology and Metabolism (4)
Second term of a three-term course for students preparing for professional biochemical work. Basic principles of enzyme catalysis and mechanism, the chemistry and energetics of the primary metabolic pathways responsible for life, including glycolysis/glyconeogenesis, citric acid cycle, lipid and amino acid metabolism, oxidative phosphorylation, and photosynthesis. Also offered for graduate-level credit as Ch 591 and may be taken only once for credit. Expected preparation: Ch 490/590.

Ch 492 - Biochemistry: Nucleic Acids and Biological Information Flow (4)
Third term of a three-term course for students preparing for professional biochemical work. Structure and function of nucleotides and nucleic acids. Biochemical detail of DNA replication, RNA transcription, and protein translation. Also offered for graduate-level credit as Ch 592 and may be taken only once for credit. Expected preparation: Ch 490/590 and Ch 491/591.

Ch 493 - Biochemistry Laboratory (3)
Introduction to general techniques of biochemical including purification and characterization of enzymes. One 4-hour laboratory period, plus one hour of lecture. Also offered for graduate-level credit as Ch 593 and may be taken only once for credit. Expected preparation: Ch 491/591 or concurrent enrollment.

Ch 501 - Research (1-9)
Consent of instructor and chair of department. Credit will only be awarded after filing in the department office a well-written, detailed report approved by the instructor and the department chair. Ch 501 pass/no pass only. (Credit to be arranged.)

Ch 503 - Thesis (1-9)
See department for course description. Pass/no pass only. (Credit to be arranged.)

Ch 504 - Cooperative Education/Internship (0-9)
See department for course description. (Credit to be arranged.)

Ch 505 - Reading and Conference (0-6)
Consent of instructor and department chair. Ch 505 pass/no pass only. (Credit to be arranged.)

Ch 507 - Seminar (1-6)
Consent of instructor. Ch 507 pass/no pass only. (Credit to be arranged.)

Ch 510 - Selected Topics (1-6)
Consent of instructor and chair of department. (Credit to be arranged.)

Ch 511 - Advanced Inorganic Chemistry I (4)
Atomic orbitals, ionic bonding, valence bond theory, molecular orbital theory, crystal field theory, and introduction to coordination theory. Also offered for undergraduate-level credit as Ch 411 and may be taken only once for credit.
Prerequisite: Ch 411. Recommended prerequisites: Ch 442.

Ch 515 - Selected Topics in Inorganic Chemistry (3)
Current topics in inorganic chemistry such as advances in oxidation, solution chemistry, and fluorine chemistry. As subject matter varies, course may be repeated with consent of instructor. Also offered as Ch 615.
Prerequisite: Ch 511.

Ch 516 - Physical Chemistry for the Biosciences I (4)
Intended primarily for students in the biological sciences and allied medical health fields. The emphasis is on the application of modern physical chemistry to problems of biological interest. Ch 416 includes the study of heat, work, energy, entropy, vapor pressure, chemical equilibrium, and transport phenomena. Ch 417 covers chemical and enzyme kinetics, quantum chemistry, photochemistry, and spectroscopy. Courses must be taken in sequence. Recommended prerequisite: Ch 320, 321, a year of general physics with calculus, and two terms of calculus. Recommended prerequisites: Ch 223 and Ch 229.
Ch 517 - Physical Chemistry for the Biosciences II (4)

Intended primarily for students in the biological sciences and allied medical health fields. The emphasis is on the application of modern physical chemistry to problems of biological interest. Ch 416 includes the study of heat, work, energy, entropy, vapor pressure, chemical equilibrium, and transport phenomena. Ch 417 covers chemical and enzyme kinetics, quantum chemistry, photochemistry, and spectroscopy. Courses must be taken in sequence. Recommended prerequisite: Ch 320, 321, a year of general physics with calculus, and two terms of calculus. Recommended prerequisites: Ch 223 and Ch 229.

Ch 518 - Advanced Chemistry Laboratory (4)

Advanced techniques and their use in the preparation of compounds. One lecture; two 3-hour laboratory periods. Also offered for undergraduate-level credit as Ch 418 and may be taken only once for credit. Expected preparation: Ch 338 or 339.

Ch 524 - Electronics and Instrumentation for Chemists (2)

Selected topics in chemical instrumentation will be presented at a basic level. Representative topics are current and voltage measurements, voltage dividers, simple filters, introduction to operational amplifiers and digital circuits. Requires concurrent enrollment in Ch 425/525. Also offered for undergraduate-level credit as Ch 424 and may be taken only once for credit. Expected preparation: Ch 320, Ch 321, Ph 203, and Ch 416 or Ch 440/540.

Ch 525 - Electronics and Instrumentation Laboratory (3)

Laboratory work to accompany Ch 424/524. Two 3-hour lab periods. Requires concurrent enrollment in Ch 424/524. Also offered for undergraduate-level credit as Ch 425 and may be taken only once for credit.

Ch 526 - Instrumental Analysis (4)

Theory and application of modern instrumental methods, including UV-visible, fluorescence, atomic absorption and emission, infrared, nuclear magnetic resonance, and mass spectrometry; potentiometry and voltammetry; gas and liquid chromatography, and capillary electrophoresis. Also offered for undergraduate-level credit as Ch 426 and may be taken only once for credit.

Ch 527 - Instrumental Analysis Laboratory (4)

Laboratory work to accompany Ch 526, including electrochemistry, chromatography, and atomic and molecular spectroscopy instruments. Writing intensive course. One 5-hour laboratory period, two 2-hour recitations. Also offered for undergraduate-level credit as Ch 427 and may be taken only once for credit.

Ch 530 - Advanced Organic Chemistry (4)

Advanced treatment of general organic reactions and structure; emphasis on bonding, stereochemistry, the correlation of structure and reactivity, scope and mechanisms of organic reactions classified by reaction type. This is the first course in a sequence of two: Ch 530 and Ch 531. Also offered for undergraduate credit as Ch 430 and may be taken only once for credit. Expected preparation: Ch 336, 442/542, or 417/517.

Ch 531 - Advanced Organic Chemistry (4)

Advanced treatment of general organic reactions and structure; emphasis on bonding, stereochemistry, the correlation of structure and reactivity, scope and mechanisms of organic reactions classified by reaction type. This is the second course in a sequence of two: Ch 530 and Ch 531. Also offered for undergraduate credit as Ch 431 and may be taken only once for credit. Expected preparation: Ch 336, 442/542, or 417/517.

Ch 535 - Polymer Chemistry (4)

Fundamentals of polymers. Topics include polymer structures, molecular weights and determination, methods of polymerization including kinetics and statistics, testing and spectroscopy characterization of polymers, polymer composites and fillers, polymer reactions. Also offered for undergraduate-level credit as Ch 435 and may be taken only once for credit. Prerequisite: Ch 336.

Ch 536 - Spectrometric Analysis (3)

Ultraviolet, infrared, nuclear magnetic resonance and mass spectrometry in the analysis of molecular structure. Also offered for undergraduate-level credit as Ch 436 and may be taken only once for credit. Expected preparation: Ch 320, Ph 213, and Mth 253.

Ch 537 - Spectrometric Analysis Laboratory (1)

Use of infrared spectrometers and nuclear magnetic resonance spectrometers. One 3-hour laboratory period. Also offered for undergraduate-level credit as Ch 437 and may be taken only once for credit. Expected preparation: Ch 436/536 or concurrent enrollment. Corequisite: Ch 536.

Ch 540 - Physical Chemistry (4)

The study of thermodynamics, phase and chemical equilibria, solutions, electrochemistry, reaction rates and mechanisms, quantum mechanics, spectroscopy, electron transport, molecular modeling and statistical mechanics. This is the first course in a sequence of three: Ch 540, Ch 541, and Ch 542. Also offered for undergraduate-level credit as Ch 440 and may be taken only once for credit. Expected preparation: Ch 320, Ph 213, and Mth 253.

Ch 541 - Physical Chemistry (4)

The study of thermodynamics, phase and chemical equilibria, solutions, electrochemistry, reaction rates and mechanisms, quantum mechanics, spectroscopy, electron transport, molecular modeling and statistical mechanics. This is the second course in a sequence of three: Ch 540, Ch 541, and Ch 542. Also offered for undergraduate-level credit as Ch 441 and may be taken only once for credit. Expected preparation: Ch 320, Ph 213, and Mth 253.

Ch 542 - Physical Chemistry (4)

The study of thermodynamics, phase and chemical equilibria, solutions, electrochemistry, reaction rates and mechanisms, quantum mechanics, spectroscopy, electron transport, molecular modeling and statistical mechanics. This is the third course in a sequence of three: Ch 540, Ch 541, and Ch 542. Also offered for undergraduate-level credit as Ch 442 and may be taken only once for credit. Expected preparation: Ch 320, Ph 213, and Mth 253.
Ch 543 - Numerical Data Analysis and Modeling in Chemistry (2)

The study of statistical analysis of experimental data and modeling of chemical systems using modern computational resources. Also offered for undergraduate-level credit as Ch 443 and may be taken only once for credit.

Prerequisite: Ch 320/321, and Ph 223 or Ph 213. Concurrent enrollment in Ch 440/540 recommended.

Ch 544 - Physical Chemistry Laboratory (2)

Laboratory work to accompany Ch 441/541, 442/542. One 4-hour laboratory period. This is the first lab in a sequence of two: Ch 544 and Ch 545. Also offered for undergraduate-level credit as Ch 444 and may be taken only once for credit. Expected preparation: Ch 321 and concurrent enrollment in Ch 441/541, 442/542 respectively.

Ch 545 - Physical Chemistry Laboratory (2)

Laboratory work to accompany Ch 441/541, 442/542. One 4-hour laboratory period. This is the second lab in a sequence of two: Ch 544 and Ch 545. Also offered for undergraduate-level credit as Ch 445 and may be taken only once for credit. Expected preparation: Ch 321 and concurrent enrollment in Ch 441/541, 442/542 respectively.

Ch 551 - Materials Chemistry Laboratory (3)

A suite of laboratory experiments in modern materials chemistry. Topics include nonmolecular inorganic solids (semiconductors, superconductors, sols, and gels), thin polymeric films, magnetic and photonic materials. Equal emphasis is placed on synthesis and physical characterization. Also offered for undergraduate-level credit as Ch 445 and may be taken only once for credit. Expected preparation: Ch 338 or Ch 339.

Ch 560 - Prebiotic Chemistry (4)

Reaction pathways for the abiological production of molecules involved in biological information flow. Also offered for undergraduate-level credit as Ch 460 and may be taken only once for credit. Expected Preparation: completion or concurrent enrollment in Ch 492/592.

Ch 570 - NMR Spectroscopy (4)

Nuclear magnetic resonance spectroscopy theory and practice. Basic quantum theory of magnetic moments, the semi-classical vector model of spins, and the product operator formalism will be applied using a variety of NMR spectroscopic techniques. Also offered for undergraduate-level credit as Ch 470 and may be taken only once for credit. Expected preparation: Ch 417 or Ch 442.

Ch 571 - Biological NMR Spectroscopy (4)

Nuclear magnetic resonance spectroscopy (NMR) of biological systems. The basic theory of NMR, its application to complex biological molecules and complexes. Also offered for undergraduate-level credit as Ch 471 and may be taken only once for credit. Expected preparation: Ch 470/570.

Ch 586 - Environmental Chemistry (4)

Survey of chemical aspects of major environmental issues: stratospheric ozone holes and chlorofluorocarbons; air pollution; global climate change; fossil fuel energy/“carbon footprint”; renewable energy; nuclear energy/radioactivity; toxic chemicals (pesticides, PCBs); endocrine disruptors; surfactants, chemical dispersants/oil spills; biodegradability of chemicals; chemistry of natural waters/acid rain; toxic heavy metals. This is the same course as CE 586 and can be taken only once for credit.

Prerequisite: Ch 334 or Ch 331. Crosslisted as: CE 586.

Ch 587 - Aquatic Chemistry (4)

Aqueous chemistry in natural water systems: simple-to-complex acid/base chemistry; titration curves; buffer strength; acid/base chemistry of carbon dioxide in open and closed systems; alkalinity as system variable (blood); mineral dissolution/precipitation (metal carbonates); redox chemistry: pe-pH, redox succession/organic loading/dissolved oxygen loss, nitrate reduction, iron oxide dissolution, hydrogen sulfide production, methane formation. This is the same course as CE 587 and can be taken only once for credit.

Prerequisite: Ch 223. Crosslisted as: CE 587.

Ch 590 - Biochemistry: Structure and Function (4)

First term of a three-term course for students preparing for professional biochemical work. Structures of biological molecules and assemblies, including proteins, nucleic acids, and lipids, and how these structures give rise to their biological functions. Also offered for undergraduate-level credit as Ch 490 and may be taken only once for credit. Expected preparation: Ch 336. Recommended pre- or corequisites: Ch 416 or Ch 440/540, Ch 320/321, and Bi 253.

Ch 591 - Biochemistry: Enzymology and Metabolism (4)

Second term of a three-term course for students preparing for professional biochemical work. Basic principles of enzyme catalysis and mechanism, the chemistry and energetics of the primary metabolic pathways responsible for life, including glycolysis/gluconeogenesis, citric acid cycle, lipid and amino acid metabolism, oxidative phosphorylation, and photosynthesis. Also offered for undergraduate-level credit as Ch 491 and may be taken only once for credit. Expected preparation: Ch 490/590.

Ch 592 - Biochemistry: Nucleic Acids and Biological Information Flow (4)

Third term of a three-term course for students preparing for professional biochemical work. Structure and function of nucleotides and nucleic acids. Biochemical detail of DNA replication, RNA transcription, and protein translation. Also offered for undergraduate-level credit as Ch 492 and may be taken only once for credit. Expected preparation: Ch 490/590 and Ch 491/591.

Ch 593 - Biochemistry Laboratory (3)

Introduction to general techniques of biochemistry including purification and characterization of enzymes. One 4-hour laboratory period, plus one hour of lecture. Also offered for undergraduate-level credit as Ch 493 and may be taken only once for credit. Expected preparation: Ch 491/591 or concurrent enrollment.

Ch 601 - Research (1-9)

See department for course description. Pass/no pass only. (Credit to be arranged.)

Ch 602 - Independent Study (1-9)

(Credit to be arranged.)
Ch 603 - Dissertation (1-12)
See department for course description.
(Credit to be arranged.)

Ch 604 - Cooperative Education/internship (1-9)
See department for course description.
(Credit to be arranged.)

Ch 605 - Reading and Conference (0-9)
See department for course description.
Pass/no pass only. (Credit to be arranged.)

Ch 606 - Projects (1-9)
(Credit to be arranged.)

Ch 607 - Seminar (1-9)
See department for course description.
Pass/no pass only. (Credit to be arranged.)

Ch 610 - Selected Topics (1-9)
See department for course description.
(Credit to be arranged.)

Ch 615 - Selected Topics in Inorganic Chemistry (3)
Current topics in inorganic chemistry such as advances in oxidation, solution chemistry, and fluorine chemistry. As subject matter varies, course may be repeated with consent of instructor. Also offered as Ch 515.
Prerequisite: Ch 511.

Ch 621 - Advanced Analytical Theory (3)
Modern methods of analysis and their application to the analytical chemistry of elements.
Prerequisite: Ch 425/525 and 442/542.

Ch 633 - Organic Synthesis (3)
Organic reactions, mechanisms and stereocchemistry with application to multistep synthesis. Recommended prerequisite: Ch 431/531.

Ch 634 - Advanced Topics in Organic Chemistry (3)
Current topics such as stereochemistry, natural products, pericyclic reactions, carbonium ions, heterocyclic and polycyclic compounds, organic photochemistry. As subject matter varies, course may be repeated with consent of instructor. Recommended prerequisite: Ch 431/531.

Ch 635 - Physical Organic Chemistry (3)
Modern concepts of physical-organic chemistry and their use in the study of mechanisms of organic reactions and reactivities of organic compounds. Recommended prerequisite: Ch 431/531.

Ch 661 - Photochemistry (3)
An introduction to the chemistry of the interaction of light with matter. Absorption and emission of light, photochemical and photophysical processes, photochemical kinetics and mechanisms. Reactivity of excited states of molecules and atoms.
Prerequisite: Ch 441/541.

Ch 662 - Chemical Kinetics (4)
Chemical kinetics in the gas phase and in solution, catalysis, and absolute rate theory.
Prerequisite: Ch 442/542.

Ch 663 - Chemical Thermodynamics (3)
The laws of thermodynamics and their applications.
Prerequisite: Ch 442/542.

Ch 665 - Statistical Thermodynamics (3)
Foundations of the subject with application to the equilibrium thermodynamics of gases, liquids, and solids.
Prerequisite: Ch 664.

Ch 670 - Atmospheric Chemistry (3)
Physical chemistry of the earth's atmosphere, including global chemical budgets, atmospheric thermodynamics, photo-chemical reactions in the lower and upper atmosphere, chemical properties of aerosols, and global climate change.
Prerequisite: Ch 442/542.

Ch 693 - Enzyme Structure and Function (4)
Chemical and physical properties of enzymes; energetics, kinetics, and mechanism of enzymatic reactions.
Prerequisite: Ch 491/591.

Ch 695 - Advances in Biochemistry (3)
Current topics in biochemistry such as neurobiochemistry, membrane structure, differentiation, metabolic regulation, bioenergetics, nucleic acids. As subject matter varies, course may be repeated with consent of instructor.
Prerequisite: Ch 492/592.

Ch 699 - Special Studies (1-6)
(Credit to be arranged.)

ChLa - Chicano-Latino

ChLa 201 - Introduction to Chicano/Latino Studies (4)
An introductory history of Latinos in the United States. Beginning with Spanish colonization and moving to the recent migration of Latin and South Americans in the 1970s, 1980s, and early 1990s. Special attention will be given to particular events that shaped and influenced the Latino experience, such as the Mexican-American War, Repatriation, Bracero Program, World War II, War on Poverty, the Chicano Movement, and U.S. foreign policy in Latin America.

ChLa 301 - Chicano/Latino Communities (4)
Contemporary sociological studies and theory used to understand and explain the status of Chicanos and Latinos in the U.S. Topics will include family, gender relations, immigration, work and employment, inter- and intra-ethnic and racial relations in the community.

ChLa 301U - Chicano/Latino Communities (4)
Contemporary sociological studies and theory used to understand and explain the status of Chicanos and Latinos in the U.S. Topics will include family, gender relations, immigration, work and employment, inter- and intra-ethnic and racial relations in the community.
ChLa 302 - Survey of Chicano/Latino Literature (4)
A representative overview of Chicano/Latino literature covering poetry, theater, novel, short story, and essay. The course will include literary techniques, modes of expression, trends in Chicano and Latino creativity, critical approaches, and will expose students to available bibliographic resources in the field.

ChLa 302U - Survey of Chicano/Latino Literature (4)
A representative overview of Chicano/Latino literature covering poetry, theater, novel, short story, and essay. The course will include literary techniques, modes of expression, trends in Chicano and Latino creativity, critical approaches, and will expose students to available bibliographic resources in the field.

ChLa 303 - Chicana/Latina Experience (4)
The social, political, and literary experience of women in the Chicano and Latino communities. The women's perspective and position in historical events, community organizing, and social issues will be explored through literature, art, music, and social science research.

ChLa 303U - Chicana/Latina Experience (4)
The social, political, and literary experience of women in the Chicano and Latino communities. The women's perspective and position in historical events, community organizing, and social issues will be explored through literature, art, music, and social science research.

ChLa 325 - Mexican American/Chicano History I, 1492-1900 (4)
Mexican American/Chicano/a history from the Conquest of the Americas to 1900 with an emphasis on empire, civil rights, identity, culture, sexuality, and war. This is the same course as Hst 325 and may be taken only once for credit.

ChLa 326 - Mexican American/Chicano History II, 1900-Present (4)
Mexican American/Chicano/a history from 1900 to the present with an emphasis on migration, ethnicity, labor, civil rights, identity, and culture. This is the same course as Hst 326 and may be taken only once for credit.

ChLa 330 - Latino Popular Culture (4)
Explores a wide scope of Latino popular culture: highly produced entertainment (television, radio, film, magazines); commercial and noncommercial musical and artistic expression; popular celebrations; and the culture of “everyday life,” from traditional folklore to newly invented customs and rituals. Popular culture is examined to reveal how Latino groups (Mexicans, Cubans, Dominicans, Puerto Ricans, etc.), reinvent their culture, heritage, and ethnic identity in the United States, and how Latinos in the process are changing American popular culture and national identity. Students will become familiar with theories of popular culture and get hands-on experience investigating a Latino popular culture form.

ChLa 375 - Southwestern Borderlands (4)
Social, economic, political organization, and representation of the United States/Mexico borderlands. While conflict characterizes the history of the interactions among border actors, the contemporary period reveals growing interdependence and economic integration. Explores cultural and social formations of Anglo-Americans and Mexican Americans in a dynamic contact zone, as well as the continuities and discontinuities in popular and academic representations of the border experience.

ChLa 375U - Southwestern Borderlands (4)
Social, economic, political organization, and representation of the United States/Mexico borderlands. While conflict characterizes the history of the interactions among border actors, the contemporary period reveals growing interdependence and economic integration. Explores cultural and social formations of Anglo-Americans and Mexican Americans in a dynamic contact zone, as well as the continuities and discontinuities in popular and academic representations of the border experience.

ChLa 380 - Latinos in the Economy and Politics (4)
Offers an overview of economic and political issues facing Latino communities in the United States, with an emphasis on labor market experience, the causes of poverty, and the role of political and civic organizations in shaping Latino ethnic identity.

ChLa 380U - Latinos in the Economy and Politics (4)
Offers an overview of economic and political issues facing Latino communities in the United States, with an emphasis on labor market experience, the causes of poverty, and the role of political and civic organizations in shaping Latino ethnic identity.

ChLa 390 - Latinos in the Pacific Northwest (4)
Introduction to past and present experiences of Mexicans and other Latin American-origin populations in the U.S. Pacific Northwest. Attention to current population growth, including sources of migration and settlement patterns. Explores the present social, economic, and political status of Latinos in this region of the country.

ChLa 390U - Latinos in the Pacific Northwest (4)
Introduction to past and present experiences of Mexicans and other Latin American-origin populations in the U.S. Pacific Northwest. Attention to current population growth, including sources of migration and settlement patterns. Explores the present social, economic, and political status of Latinos in this region of the country.

ChLa 399 - Special Studies (1-8)
See department for course description. (Credit to be arranged.)

ChLa 399U - Special Studies (4)
(Credit to be arranged.)

ChLa 401 - Research (1-8)
Consent of instructor. See department for course description. (Credit to be arranged.)

ChLa 405 - Reading and Conference (1-8)
Consent of instructor. See department for course description. (Credit to be arranged.)

ChLa 407 - Seminar (1-8)
Consent of instructor. See department for course description. (Credit to be arranged.)
ChLa 408 - Workshop (1-8)
Consent of instructor. See department for course description. (Credit to be arranged.)

ChLa 410 - Selected Topics (1-8)
See department for course description. (Credit to be arranged.)

ChLa 410U - Selected Topics (4)
(Credit to be arranged.)

ChLa 411 - Chicano/Latino History Seminar (4)
This course will take an in-depth look at the history of Chicano/Latino experience in this country examining such issues as the Treaty of Guadalupe-Hidalgo and its affect on Latinos. Additional topics will include issues dealing with why the Puerto Rican and Cuban experience has been different than for other Latinos in this country. Recommended prerequisite: ChLa 201.

ChLa 414 - Chicano/Latino Literature (4)
Examination of the works created by some of the leading Chicano/Latino novelists, poets, and short fiction writers from the 1960s to present day. The course will look at the impact of their work and how it impacts how Latinos view themselves and their place in American society. Recommended prerequisite: ChLa 203.

ChLa 450 - Latinos in Education (4)
Surveys historical and contemporary social science research on the factors influencing the educational status of Latinos in the United States. A brief history of the Latino schooling experience serves as an introduction to current issues such as bilingual education, school segregation, and higher education access. Special attention is given to educational inequalities among Latinos and to the relationship between schooling and limited class mobility. Prerequisite: upper-division standing.

ChLa 450U - Latinos in Education (4)
Surveys historical and contemporary social science research on the factors influencing the educational status of Latinos in the United States. A brief history of the Latino schooling experience serves as an introduction to current issues such as bilingual education, school segregation, and higher education access. Special attention is given to educational inequalities among Latinos and to the relationship between schooling and limited class mobility. Prerequisite: upper-division standing.

ChLa 507 - Seminar (1-8)
(Credit to be arranged.)

ChLa 510 - Selected Topics (1-8)
See department for course description. (Credit to be arranged.)

Chn - Chinese

Chn 101 - First-year Chinese (5)
An introduction to Mandarin: listening, speaking, reading, and writing. Characters and spoken language presented concurrently throughout the year. This is the first course in a sequence of three: Chn 101, Chn 102, and Chn 103.

Chn 102 - First-year Chinese (5)
An introduction to Mandarin: listening, speaking, reading, and writing. Characters and spoken language presented concurrently throughout the year. This is the second course in a sequence of three: Chn 101, Chn 102, and Chn 103.

Chn 103 - First-year Chinese (5)
An introduction to Mandarin: listening, speaking, reading, and writing. Characters and spoken language presented concurrently throughout the year. This is the third course in a sequence of three: Chn 101, Chn 102, and Chn 103.

Chn 199 - Special Studies (1-12)
(Credit to be arranged.)

Chn 201 - Second-year Chinese (5)
Continued work in Mandarin, with emphasis on mastering all basic grammatical structures, developing conversation skills, and building vocabulary in characters with correct pronunciation. This is the first course in a sequence of three: Chn 201, Chn 202, and Chn 203. Recommended prerequisite: Chn 103.

Chn 202 - Second-year Chinese (5)
Continued work in Mandarin, with emphasis on mastering all basic grammatical structures, developing conversation skills, and building vocabulary in characters with correct pronunciation. This is the second course in a sequence of three: Chn 201, Chn 202, and Chn 203. Recommended prerequisite: Chn 103.

Chn 203 - Second-year Chinese (5)
Continued work in Mandarin, with emphasis on mastering all basic grammatical structures, developing conversation skills, and building vocabulary in characters with correct pronunciation. This is the third course in a sequence of three: Chn 201, Chn 202, and Chn 203. Recommended prerequisite: Chn 103.

Chn 299 - Special Studies (1-12)
(Credit to be arranged.)

Chn 301 - Third-year Chinese (4)
Intermediate conversation, reading, writing, vocabulary building, and grammar. Introduction to literary and expository texts. This is the first course in a sequence of three: Chn 301, Chn 302, and Chn 303. Recommended prerequisite: Chn 203.

Chn 302 - Third-year Chinese (4)
Intermediate conversation, reading, writing, vocabulary building, and grammar. Introduction to literary and expository texts. This is the second course in a sequence of three: Chn 301, Chn 302, and Chn 303. Recommended prerequisite: Chn 203.

Chn 303 - Third-year Chinese (4)
Intermediate conversation, reading, writing, vocabulary building, and grammar. Introduction to literary and expository texts. This is the third course in a sequence of three: Chn 301, Chn 302, and Chn 303. Recommended prerequisite: Chn 203.

Chn 304 - Chinese Newspaper Readings (4)

Chn 306 - Business Chinese (4)
Practice in oral and written Chinese at the upper-intermediate level, with emphasis on business vocabulary and procedures. Recommended as a complement to third-year Chinese. Recommended prerequisites: Chn 203; Chn 303, 304.
Chn 311 - Introductory Classical Chinese (4)
Readings in the traditional literary language, designed to provide familiarity with essential particles and structures, build vocabulary, and introduce works from all genres and periods. Recommended as a complement to third-year Chinese; preparation for advanced work in either modern or classical Chinese. This is the first course in a sequence of two: Chn 311 and Chn 312. Recommended prerequisite: Chn 203.

Chn 312 - Introductory Classical Chinese (4)
Readings in the traditional literary language, designed to provide familiarity with essential particles and structures, build vocabulary, and introduce works from all genres and periods. Recommended as a complement to third-year Chinese; preparation for advanced work in either modern or classical Chinese. This is the second course in a sequence of two: Chn 311 and Chn 312. Recommended prerequisite: Chn 203.

Chn 311 and Chn 312. Recommended coursework in Chinese, preferably including Chn 311 and Chn 312.

Chn 311 and Chn 312. Recommended coursework in Chinese, preferably including Chn 311 and Chn 312.

Chn 341 - Topics in Chinese Literature and Thought: Service and Retreat (4)
Interdisciplinary readings from the core of the written tradition, including history, poetry, classical anecdotes and essays, related to the central issues facing the Chinese elite throughout history: whether, how, and under what conditions to serve the state. Conducted in English.

Chn 341U - Topics in Chinese Literature and Thought: Service and Retreat (4)
Interdisciplinary readings from the core of the written tradition, including history, poetry, classical anecdotes and essays, related to the central issues facing the Chinese elite throughout history: whether, how, and under what conditions to serve the state. Conducted in English.

Chn 342 - Chinese Vernacular Literature (4)
342 emphasizes traditional poetry and fiction from 700 BC to the late nineteenth century; 343 emphasizes influential works of the twentieth century, from semi-traditional to avant-garde. This is the first course in a sequence of two: Chn 342 and Chn 343. Conducted in English.

Chn 343 - Chinese Vernacular Literature (4)
342 emphasizes traditional poetry and fiction from 700 BC to the late nineteenth century; 343 emphasizes influential works of the twentieth century, from semi-traditional to avant-garde. This is the second course in a sequence of two: Chn 342 and Chn 343. Conducted in English.

Chn 343U - Chinese Vernacular Literature (4)
342 emphasizes traditional poetry and fiction from 700 BC to the late nineteenth century; 343 emphasizes influential works of the twentieth century, from semi-traditional to avant-garde. This is the second course in a sequence of two: Chn 342 and Chn 343. Conducted in English.

Chn 399 - Special Studies (1-6)
(Credit to be arranged.)

Chn 404 - Cooperative Education/Internship (1-12)
(Credit to be arranged.)

Chn 405 - Reading and Conference (1-8)
(Credit to be arranged.)

Chn 408 - Workshop (1-8)
(Credit to be arranged.)

Chn 409 - Practicum (1-12)
(Credit to be arranged.)

Chn 410 - Selected Topics (1-6)
(Credit to be arranged.)

Chn 411 - Advanced Chinese (4)
Development of facility with complex patterns in conversation, reading and writing. Topics such as Rural China, The Philosophers, Documentary Chinese, The Structure of Chinese. This is the second course in a sequence of two: Chn 411 and Chn 412. Also offered for graduate-level credit as Chn 511 and may be taken only once for credit. Recommended prerequisites: Chn 303; Chn 304, 311, 312.

Chn 413 - Advanced Classical Chinese (4)
Readings from classical works of various genres and historical periods, designed to solidify the structures introduced in Chn 311 and 312, build further vocabulary and introduce the fundamentals of classical Chinese literary history. Also offered for graduate-level credit as Chn 513 and may be taken only once for credit. Recommended prerequisite: extensive third-year coursework in Chinese, preferably including Chn 311 and Chn 312.

Chn 420 - Readings in Chinese Literature (4)
Reading, analysis, and discussion of representative literary texts. Chn 420 focuses on pre-modern topics such as "traditional Chinese Fiction" and "Chinese Classic Masterpieces," while Chn 421 addresses primarily twentieth-century topics such as "Chinese Nativist Literature" or "Chinese Urban Literature." This is the first course in a sequence of two: Chn 420 and Chn 421. Also offered for graduate-level credit as Chn 520 and may be taken only once for credit. Recommended prerequisites: Chn 303; Chn 304, 311, 312.

Chn 421 - Readings in Chinese Literature (4)
Reading, analysis, and discussion of representative literary texts. Chn 420 focuses on pre-modern topics such as "Traditional Chinese Fiction" and "Chinese Classical Masterpieces," while Chn 421 addresses primarily twentieth-century topics such as "Chinese Nativist Literature" or "Chinese Urban Literature." This is the second course in a sequence of two: Chn 420 and Chn 421. Also offered for graduate-level credit as Chn 521 and may be taken only once for credit. Recommended prerequisites: Chn 303; Chn 304, 311, 312.

Chn 490 - History of the Chinese Language (4)
History of the Chinese language and language family, with emphasis on the development of the current standard language. Evolution of phonology,
morphology, and syntax in spoken Chinese, development of the Chinese writing system, history of Chinese lexicography, and current language policy. Conducted in English. Also offered for graduate-level credit as Chn 590 and may be taken only once for credit. Recommended prerequisite: at least one course in linguistics (Ling 290 or above), or proficiency in Chinese equivalent to Chn 203.

Chn 505 - Reading and Conference (1-8)
(Credit to be arranged.)

Chn 509 - Practicum (1-12)
(Credit to be arranged.)

Chn 510 - Selected Studies (1-6)
(Credit to be arranged.)

Chn 511 - Advanced Chinese (4)
Development of facility with complex patterns in conversation, reading and writing. Topics such as Rural China, The Philosophers, Documentary Chinese, The Structure of Chinese. This is the first course in a sequence of two: Chn 511 and Chn 512. Also offered for undergraduate-level credit as Chn 411 and may be taken only once for credit. Recommended prerequisites: Chn 303; Chn 304, 311, 312.

Chn 512 - Advanced Chinese (4)
Development of facility with complex patterns in conversation, reading and writing. Topics such as Rural China, The Philosophers, Documentary Chinese, The Structure of Chinese. This is the second course in a sequence of two: Chn 511 and Chn 512. Also offered for undergraduate-level credit as Chn 412 and may be taken only once for credit. Recommended prerequisites: Chn 303; Chn 304, 311, 312.

Chn 513 - Advanced Classical Chinese (4)
Readings from classical works of various genres and historical periods, designed to solidify the structures introduced in Chn 311 and 312, build further vocabulary and introduce the fundamentals of classical Chinese literary history. Also offered for undergraduate-level credit as Chn 413 and may be taken only once for credit. Recommended prerequisite: extensive third-year coursework in Chinese, preferably including Chn 311 and Chn 312.

Chn 520 - Readings in Chinese Literature (4)
Reading, analysis, and discussion of representative literary texts. Chn 420 focuses on pre-modern topics such as "Traditional Chinese Fiction" and "Chinese Classical Masterpieces," while Chn 421 addresses primarily twentieth-century topics such as "Chinese Nativist Literature" or "Chinese Urban Literature." This is the first course in a sequence of two: Chn 520 and Chn 521. Also offered for undergraduate-level credit as Chn 420 and may be taken only once for credit. Recommended prerequisites: Chn 303; Chn 304, 311, 312.

Chn 521 - Readings in Chinese Literature (4)
Reading, analysis, and discussion of representative literary texts. Chn 420 focuses on pre-modern topics such as "Traditional Chinese Fiction" and "Chinese Classical Masterpieces," while Chn 421 addresses primarily twentieth-century topics such as "Chinese Nativist Literature" or "Chinese Urban Literature." This is the second course in a sequence of two: Chn 520 and Chn 521. Also offered for undergraduate-level credit as Chn 421 and may be taken only once for credit. Recommended prerequisites: Chn 303; Chn 304, 311, 312.

Chn 590 - History of the Chinese Language (4)
History of the Chinese language and language family, with emphasis on the development of the current standard language. Evolution of phonology, morphology, and syntax in spoken Chinese, development of the Chinese writing system, history of Chinese lexicography, and current language policy. Conducted in English. Also offered for undergraduate-level credit as Chn 490 and may be taken only once for credit. Recommended prerequisite: at least one course in linguistics (Ling 290 or above), or proficiency in Chinese equivalent to Chn 203.

CI - Curriculum & Instruction

CI 199 - Special Studies (1-3)
(Credit to be arranged.)

CI 251 - Introduction to Early Childhood Education (3)
This course will provide an overview of the early childhood education profession, including issues, research, historical influences, programs for young children, and career options. Field experience required.

CI 252 - Instruction and Management in Preschool Education (3)
Growth and development characteristics of preschool children (ages 3-5) for planning educational programs, curriculum, instruction, scheduling, and environment, management, and parent communication. Field experience required. Recommended prerequisite: CI 251.

CI 350 - Aesthetics and Physical Education for Young Children (4)
This course will provide preparation for planning, implementing, and evaluating developmentally appropriate integrated teaching and learning experiences in preschool settings. Field experience required. Recommended prerequisite: CI 251.

CI 351 - Science, Social Studies and Health for Young Children (5)
This course will provide preparation for planning, implementing, and evaluating developmentally appropriate integrated teaching and learning experiences in science, social studies, and health for young learners, ages 4-8 years. Recommended prerequisites: admission to teacher education; CI 251.

CI 401 - Research (1-6)
(Credit to be arranged.) Consent of instructor.

CI 402 - Independent Study (1-3)
(Credit to be arranged.)

CI 403 - Thesis (1-6)
(Credit to be arranged.)

CI 404 - Cooperative Education/Internship (1-12)
(Credit to be arranged.)
CI 405 - Reading and Conference (1-6)
(Credit to be arranged.) Consent of instructor.

CI 406 - Special Problems (1-6)
(Credit to be arranged.)

CI 407 - Seminar (1-6)
(Credit to be arranged.)

CI 408 - Workshop (1-8)
(Credit to be arranged.)

CI 409 - Practicum (1-15)
(Credit to be arranged.) Consent of instructor.

CI 410 - Experimental Course (1-12)
(Credit to be arranged.)

CI 432 - Computer Applications for the Classroom (3)
This course is designed for pre-service or in-service teachers who wish to become comfortable with the use of the computer to enhance classroom teaching and learning. Topics include an introduction to computers and technology in education; review and curriculum integration of courseware; use of word processing; designing and using computer-based databases in the classroom; computer literacy; and graphics software for the classroom. Also offered for graduate-level credit as CI 532 and may be taken only once for credit.

CI 433 - Computer Applications in Instruction (3)
A comprehensive survey of the use of microcomputers in instruction. Terminology, educational applications, ethical issues, courseware, evaluation and selection, multimedia applications, management tools for educators, planning and organizing for school computer use, hardware selection, computer literacy and technological literacy, and network resources for teachers. Hands-on use of the computer to review courseware is an important part of the course. Also offered for graduate-level credit as CI 533 and may be taken only once for credit. Expected preparation: CI 432 or equivalent.

CI 434 - Microcomputer-based Management and Research Tools for Educators (3)
This course introduces educators to important and useful tools for classroom, personal, and professional use: word processing, database, spreadsheet, survey, and statistical applications. Each class session includes demonstration and hands-on use of microcomputers. Each student will develop a word-processed document, a database, a spreadsheet application, a survey, and a statistical document. Also offered for graduate-level credit as CI 534 and may be taken only once for credit. Expected preparation: CI 432 or equivalent.

CI 443 - Effective Tchg Strategies & Materials for Working with Linguistically & Culturally Diverse Stdnts (3)
What strategies and materials work in teaching children who are learning English? Become acquainted with the current research on identification, development, and practice of developmentally and linguistically appropriate strategies and materials to effectively engage English Language Learners (ELL) at all grade levels in the learning process. Special attention will be given to students' bilingual/bicultural characteristics as important aspects of developing successful curriculum. Also offered for graduate-level credit as CI 543 and may be taken only once for credit.

CI 458 - Advanced Curriculum Design in Kindergarten/ Primary Grades (3)
This course will consider growth and development characteristics of children ages 5-8 years and research on teaching for planning educational programs, curricula, instruction, environment, management, and guidance. Also offered for graduate-level credit as CI 548 and may be taken only once for credit.

CI 457 - Supervision in Early Childhood Education Settings (3)
Integrates theory and research of adult and professional development with supervisory models and practices appropriate for early childhood education settings. Also offered for graduate-level credit as CI 575 and may be taken only once for credit. Expected preparation: Undergraduate early childhood education coursework or teaching experience with young children.

CI 476 - Equity and Cultural Diversity in Early Childhood Education (3)
Explore developmental early childhood education practices, emphasizing developmentally and culturally appropriate objectives as well as anti-bias learning goals. Develop awareness of quality teaching practices by exploring personal cultural history, gaining insights into living examples of difference, witnessing the effects of bias, and learning to support fairness and issues of equity in a classroom. Also offered for graduate-level credit as CI 576 and may be taken only once for credit.

CI 477 - Learning Designs: Early Childhood Environments (3)
Study of quality learning environments and design, emphasizing the roles of children’s learning, adult engagement, and the environment as the third teacher. Investigate space planning, program layout, design theories, and aesthetic values. Also offered for graduate-level credit as CI 577 and may be taken only once for credit.

Prerequisite: Junior level standing, prior coursework in child development, or consent of instructor.

CI 478 - Constructivist Curriculum: Big Ideas in Early Childhood Education (3)
Examines the possibilities of exploring big ideas deeply over time and across the curriculum with preschool and primary age children. Focuses on the ways that integrated curriculum and project work support children’s learning and foster the connections necessary for them to construct knowledge. Students have the opportunity to develop resources and design classroom experiences related to big ideas. Also offered for graduate-level credit as CI 578 and may be taken only once for credit.
Prerequisite: Junior level standing, prior coursework in child development, or consent of instructor.

CI 479 - Young Child as Scientist (3)
Explores developmentally appropriate science for preschool and primary age children, focusing on experimentation and problem-solving. Students experience and design activities for young children around three questions that derive from traditional science content: can I make it move, can I make it change, and how does it fit? In the process, students will learn more about constructivist teaching and curriculum, particularly as applied to science education. Also offered for graduate-level credit as CI 597 and may be taken only once for credit.

Prerequisite: Junior level standing, prior coursework in child development, or consent of instructor.

CI 491 - Enriching Children's Reading (3)

CI 496 - Second Language Acquisition and Development for K-12 Educators (3)
Gain historical perspectives on language teaching. Study major concepts, theories, research and variables related to the nature and acquisition of language. Consider individual differences and patterns common to all learners. Collect/analyze natural language from language learners. Construct environments that support ESOL/bilingual students' language/literacy development and content-area achievement. Also offered for graduate-level credit as CI 596 and may be taken only once for credit.

Prerequisite: Admission into the Secondary Graduate Teacher Education Program (GTEP), the Secondary Dual Endorsement Program (SDEP), or the Bilingual Teacher Pathway (BTP) Program.

CI 497 - Assessment of Language and Content Learning for K-12 English Learners (2)
Consider fair, accurate, and meaningful assessment for English learners. Learn about common standards-based assessment instruments. Examine differences between and uses for assessments measuring language proficiency and content area achievement as they affect ESOL and bilingual student learning. Explore issues in classroom-based assessment of ELLs. Also offered for graduate-level credit as CI 597 and may be taken only once for credit.

Prerequisite: Admission into the Secondary Graduate Teacher Education Program (GTEP), the Secondary Dual Endorsement Program (SDEP), or the Bilingual Teacher Pathway (BTP) Program.

CI 501 - Research (1-9)
(Credit to be arranged.) Consent of instructor.

CI 502 - Independent Study (1-12)
(Credit to be arranged.)

CI 503 - Thesis (1-9)
(Credit to be arranged.)

CI 504 - Cooperative Education/Internship (1-9)
(Credit to be arranged.)

CI 505 - Reading and Conference (1-15)
(Credit to be arranged.) Consent of instructor.

CI 506 - Special Problems (1-6)
(Credit to be arranged.)

CI 507 - Seminar (1-6)
(Credit to be arranged.)

CI 508 - Workshop (1-8)
(Credit to be arranged.)

CI 509 - Practicum: Reading Endorsement (1-9)
Practicum requires reading endorsement candidates to work directly with students. Candidates will enact the various responsibilities of a reading specialist/literacy coach, to include: assessing and instructing a struggling reader, developing curriculum for various groups of readers, assessing and making recommendations for individual teachers or for a school’s reading program, developing literacy-focused professional development sessions for instructional assistants, and communicating with parents and community members.

Prerequisite: Prerequisites: Oregon teaching license, admittance to program, 15 credit hours.

CI 510 - Experimental Course (1-15)
(Credit to be arranged.)

CI 511 - Examining Base Ten Numeration and Operations (3)
Explore the base ten structure of the number system and how that structure is used in multi-digit computation. Investigate how basic concepts of whole numbers reappear when working with decimals. Student thinking is at the center of this course through examination of student work and students at work.

CI 512 - Examining Operations with Whole Numbers and Fractions (3)
Examine the actions and situations modeled by the four basic operations. Begin with a view of how counting moves toward solving whole number problems and then how whole number operations extend to the context of fractions. Student thinking is at the center of this course through examination of student work.

CI 513 - Enhancing Algebraic Thinking: Generalization about Operations (3)
Examine generalizations at the heart of studying operations in the elementary grades. Express generalizations in common language and algebraically, develop representation-based arguments, study what it means to prove, and extend generalizations from whole numbers to integers. Student thinking is at the center of this course through examination of student work.

CI 514 - Enhancing Algebraic Thinking: Patterns and Functions (3)
Discover how patterns lead to functions, learn to read tables and graphs to interpret change, and use algebraic notation to write rules. With emphasis on linear functions, explore nonlinear functions, examine how function features are seen in graphs, tables, or rules. Student thinking is at the center of this course.

CI 515 - Developing Geometric Thinking and Concepts (3)
Examine aspects of two- and three-dimensional shapes, develop geometric vocabulary, and explore both definitions and
properties of geometric objects. Study angle, similarity, congruence, and the relationships between 3-D objects and their 2-D representations. Student thinking is at the center of this course through examination of student work.

CI 516 - Exploring Measurement Concepts (3)
Examine different attributes of size, develop facility in composing and decomposing shapes, and apply these skills to make sense of area and volume formulas. Explore conceptual issues of length, area, and volume, as well as inter-relationships. Student thinking is at the center of this course through examination of student work.

CI 517 - Developing Concepts of Data Analysis (3)
Work with data collection, representation, and interpretation. Learn what graphs and statistical measures show about data, study how to summarize data when comparing groups, consider whether data provide insights into questions that led to data collection. Student thinking is at the center of this course through examination of student work.

CI 518 - Implementing Mathematics Reform (3)
Exploration of worthwhile mathematical tasks provides the context for examining learning, teaching, and assessment. Topics include effective learning environments, strategies for planning lessons with a focus on student thinking/understanding, and analysis of materials and resources.
Prerequisite: Students are required to complete at least four content-focused pedagogy courses.

CI 519 - Mathematics Leadership: Influencing and Facilitating Improvement (3)
Develop an understanding of the role of and the challenges faced by mathematics instructional leaders in their work. Attention to the multiple levels of learning i.e., classroom and the professional learning community within grade-level, building, district, and beyond - each focusing strategies for influencing and facilitating improvement in mathematics instruction.

CI 520 - Linguistics for Teachers (3)
What should classroom teachers know about language and how it works? This course will give teachers background knowledge about the sounds, grammar, meaning system, and social context of language and the implications these have for classroom practice in reading, writing, and speaking. Addresses topics such as invented spelling, the role of phonics in reading, the teaching of grammar, and Black English and other linguistic variations.

CI 522 - Literacy Foundations (4)
Focuses on the foundational areas of psychology, history, theory, and research, and familiarizes teachers and reading specialists with varied ideas about how reading and writing work and how they are learned, through the examination of major theorists and researchers, both present and past.

CI 523 - Language Arts in Middle Schools (4)
Designed for teachers at the middle school level. Explores the nature of teaching young adolescents, including developmental psychology and methods of literacy education with a corresponding field experience. Includes ways of studying language through literature and the arts, using writing and speaking to study language, language use in different academic settings and content areas, and emerging trends for studying language in the 21st century.

CI 524 - Writing Workshop (3)
Primary focus is on establishing writing workshops in the elementary/secondary classrooms. Approach guides educators through all phases of establishing a writing workshop atmosphere. Inclusion of state writing standards and peer editing procedures as well as integrating writing across the curriculum are included.

CI 525 - Issues and Perspectives in the Teaching of Reading (3)
An examination of the development of current practices in the teaching of reading. The identification of major trends and issues and a critical review of relevant past and present research.
Prerequisite: completion of student teaching.

CI 526 - Reading for the Creative and Gifted (3)
A study of the unique reading characteristics of the creative and gifted and an overview of psychological and philosophical understandings important for the teacher teaching reading to these able students.
Prerequisite: Lib 428/528.

CI 527 - Literature in Classrooms K-8 (3)
This course focuses on the exploration of literature for students in grades K-8, and the application of literature in the classroom. Emphasis is on selection and evaluation of books, children’s reading interests, classroom applications and school leadership in promoting literature in classroom and school settings.

CI 528 - Literacy Assessment for Reading Specialists (3)
This course focuses on the purposes for literacy assessment, types of assessments, the impact of culture and language on assessment, and the fundamental link between literacy assessment and instruction. Topics include the purposes of literacy assessment tools, the selection of assessments that inform instruction and assessments that inform various stakeholders, the development of a schoolwide assessment program, and an analysis of current assessment practices. The course is designed to develop a more extensive understanding of assessment as it relates to evidence-based literacy instruction, diversity issues, and students’ literacy development.

CI 529 - School Reading Program Leadership (3)
The course is for current or future administrators, coordinators, curriculum consultants, or teachers whose responsibilities will include leadership roles in the administration of school-wide or district-wide reading programs. It deals with long- and short-term objectives, school organizational patterns, staff competencies, materials selection, program evaluation, needs assessment, and the use of community resources.
Prerequisite: CI 474/574 or equivalent.
CI 530 - Teaching Struggling Adolescent Readers (3)

Designed to help teachers to develop an understanding of adolescent readers within school settings, to expand their teaching repertoire, to assist struggling readers, and to organize plans that improve secondary literacy programs. Appropriate for classroom teachers, reading specialists, and administrators interested in adolescent literacy.

CI 531 - Facilitating Content Area Literacy Strategies (3)

Course designed to help literacy leaders to facilitate content area literacy strategies in elementary, middle, and high schools and to guide students in acquiring skills needed for adequate reading, thinking, writing, and study in the disciplines. Emphasis will be on collaborating with teachers in a leadership role to facilitate strategies in all school subjects.

CI 532 - Computer Applications for the Classroom (3)

This course is designed for pre-service or inservice teachers who wish to become comfortable with the use of the computer to enhance classroom teaching and learning. Topics include an introduction to computers and technology in education; review and curriculum integration of courseware; use of word processing; designing and using computer-based databases in the classroom; computer literacy; and graphics software for the classroom. Also offered for undergraduate-level credit as CI 432 and may be taken only once for credit.

CI 533 - Computer Applications in Instruction (3)

A comprehensive survey of the use of microcomputers in instruction. Terminology, educational applications, ethical issues, courseware, evaluation and selection, multimedia applications, management tools for educators, planning and organizing for school computer use, hardware selection, computer literacy and technological literacy, and network resources for teachers. Hands-on use of the computer to review courseware is an important part of the course. Also offered for undergraduate-level credit as CI 433 and may be taken only once for credit. Expected preparation: CI 432 or equivalent.

CI 534 - Microcomputer-based Management and Research Tools for Educators (3)

This course introduces educators to important and useful tools for classroom, personal, and professional use: word processing, database, spreadsheet, survey, and statistical applications. Each class session includes demonstration and hands-on use of microcomputers. Each student will develop a word-processed document, a database, a spreadsheet application, a survey, and a statistical document. Also offered for undergraduate-level credit as CI 434 and may be taken only once for credit. Expected preparation: CI 432 or equivalent.

CI 536 - Language, Literacy, and Culture (3)

Understanding the central importance of language as it functions within educational contexts. Implications of social, cultural, and linguistic diversity on teaching and learning.

CI 543 - Effective Tchg Strategies & Materials for Working with Linguistically & Culturally Diverse Stdnts (3)

What strategies and materials work in teaching children who are learning English? Become acquainted with the current research on identification, development, and practice of developmentally and linguistically appropriate strategies and materials to effectively engage English Language Learners (ELL) at all grade levels in the learning process. Special attention will be given to students’ bilingual/bicultural characteristics as important aspects of developing successful curriculum. Also offered for undergraduate-level credit as CI 443 and may be taken only once for credit.

CI 545 - Educating Early Adolescents (3)

Focuses on the nature of early adolescence and examines theory and practice informing development of the philosophy of early adolescent education, organizational structures appropriate for these learners, and the diverse roles of the middle-level teacher. Introduces students to the curriculum and delivery methods appropriate for emerging adolescents.

CI 547 - Advanced Elementary Literacy Methods (3)

Concentrated study of recent trends and recurring problems in selecting, organizing, evaluating, and presenting concepts, information, and materials of instruction in subjects taught in elementary school: art, health, language arts, mathematics, music, physical education, reading (includes one additional field work credit), science, social studies.

CI 558 - Advanced Curriculum Design in Kindergarten/ Primary Grades (3)

This course will consider growth and development characteristics of children ages 5-8 years and research on teaching for planning educational programs, curricula, instruction, environment, management, and guidance. Also offered for undergraduate-level credit as CI 458 and may be taken only once for credit.

CI 561 - Advanced Educational Psychology (3)

Review and development of modern viewpoints in educational psychology with particular attention to theories of learning and their application to school and educational problems; an examination of experimental material that seems most useful and relevant to educational psychology.

CI 565 - Theoretical Models of Curriculum (3)

Study of the history of curriculum and curriculum theory in the United States. Emphasis is placed on the historical, philosophical, and scientific foundations of curriculum theory. A main goal of the course is to provide a framework for evaluation, selection, and development of school curricula. Also offered as CI 665 and may be taken only once for credit.

CI 566 - Curriculum Construction (3)


CI 567 - Curriculum and Culture (3)

Understanding the cultural basis of instructional materials in curriculum development and teaching and how the organization of knowledge in a subject area and the explanation of new ideas are influenced by cultural root metaphors. Planning and administering the instructional materials center in the modern school. The cooperative roles of the teacher,
CI 568 - The Curriculum of the Public School (3)

Overview of the public school curriculum with emphasis on the various subject fields; organization of the school for curriculum development; education objectives; the course of study; evaluation of the public school curriculum.

CI 570 - Child Development and Education (3)

In-depth study of child development theory, principles, current research, practice of observational strategies, and application of growth and development data to educational programs for young children. Study will extend to decision making and developmentally appropriate practice in early childhood education.

Prerequisite: Undergraduate early childhood education coursework or teaching experience with young children.

CI 571 - Play: Curriculum in Early Childhood Education (3)

Study of stages of play, theory, research on play, cultural differences in play, and adult role in facilitation of play. Curriculum will be reviewed, developed, and integrated with a focus on play for teaching and learning, for child-centered approaches, and for meeting needs of special learners.

Prerequisite: Undergraduate early childhood education coursework or teaching experience with young children.

CI 572 - Language and Literacy in Early Childhood Education (3)

Helps teachers understand, assess, and promote early experiences with language that contribute to the process of becoming literate. Also offered for undergraduate-level credit as CI 472 and may be taken only once for credit. Expected preparation: Undergraduate early childhood education coursework or teaching experience with young children.

CI 573 - Assessment and Technology in Early Childhood Education (3)

Study of and experience with a range of developmentally appropriate assessment and technology strategies for use in diagnostic, formative, and summative evaluation of growth and development of young children and for appropriate educational decisions in early childhood education settings.

Prerequisite: Undergraduate early childhood education coursework or teaching experience with young children.

CI 574 - Assessing and Teaching Struggling Elementary Readers (3)

This course focuses on working with elementary students experiencing difficulties in learning to read. It deals with theoretically-based understanding and analysis of students’ reading; developing students reading knowledge and strategies; social and psychological aspects of literacy problems. The course includes a field experience in the form of a case study of a struggling reader. Students are responsible for arranging to work with a struggling reader in a school or other setting once or twice a week throughout the quarter.

CI 575 - Supervision in Early Childhood Education Settings (3)

Integrates theory and research of adult and professional development with supervisory models and practices appropriate for early childhood education settings. Also offered for undergraduate-level credit as CI 475 and may be taken only once for credit. Expected preparation: Undergraduate early childhood education coursework or teaching experience with young children.

CI 576 - Equity and Cultural Diversity in Early Childhood Education (3)

Explores developmentally appropriate science for preschool and primary age children, focusing on experimentation and problem-solving. Students experience and design activities for young children around the three questions that derive from traditional science content: can I make it move, can I make it change, and how does it fit? In the process, students will learn more about constructivist teaching and curriculum, particularly as applied to science education. Also offered for undergraduate-level credit as CI 476 and may be taken only once for credit.

Prerequisite: Junior level standing, prior coursework in child development, or consent of instructor.

CI 577 - Learning Designs: Early Childhood Environments (3)

Study of quality learning environments and design, emphasizing the roles of children’s learning, adult engagement, and the environment as the third teacher. Investigate space planning, program layout, design theories, and aesthetic values. Also offered for undergraduate-level credit as CI 477 and may be taken only once for credit.

Prerequisite: Junior level standing, prior coursework in child development, or consent of instructor.

CI 578 - Constructivist Curriculum: Big Ideas in Early Childhood Education (3)

Examines the possibilities of exploring big ideas deeply over time and across the curriculum with preschool and primary age children. Focuses on the ways that integrated curriculum and project work support children’s learning and foster the connections necessary for them to construct knowledge. Students have the opportunity to develop resources and design classroom experiences related to big ideas. Also offered for undergraduate-level credit as CI 478 and may be taken only once for credit.

Prerequisite: Junior level standing, prior coursework in child development, or consent of instructor.

CI 579 - Young Child as Scientist (3)

Explore developmental early childhood education practices, emphasizing developmentally and culturally appropriate objectives as well as anti-bias learning goals. Develop awareness of quality teaching practices by exploring personal cultural history, gaining insights into living examples of difference, witnessing the effects of bias, and learning to support fairness and issues of equity in a classroom. Also offered for undergraduate-level credit as CI 479 and may be taken only once for credit.

Prerequisite: Junior level standing, prior coursework in child development, or consent of instructor.

CI 580 - Theories of Instruction (3)

An investigation of what happens in the classroom, emphasizing the interrelatedness of learning, subject matter, and teaching; testing of scholars’ and the students’ own ideas against concrete case studies of instruction; formulation and defense of one’s own theory.

Prerequisite: teaching experience or consent of instructor.
CI 581 - Issues in Education (3)
An introduction to the study of contemporary issues which impact teaching and learning environments for K-12 students and their teachers. This course is a graduate seminar in which students will identify critical issues in contemporary education and analyze those issues from a variety of perspectives. Also offered as CI 681 and may be taken only once for credit.

CI 590 - Action Research Proposal (3)
Designed to help educators see themselves as researchers so that they can conduct research in educational settings that contribute to the improvement of education. Knowledge of accessing and using research literature, the range of educational research paradigms and using appropriate research methods included. Students will develop a proposal for an action research project related to improving educational outcomes for all learners.

CI 591 - Action Research Implementation (3)
Implementation of action research project designed in CI 590. Discuss issues related to implementation of action research project designed in CI 590. Learn skills to analyze data collected during implementation of action research proposal from surveys, interviews, focus groups, observation, journaling, writing and concept maps. Develop critical thinking abilities to analyze, synthesize and evaluate research results. Present final project in written paper.
Prerequisite: CI 590.

CI 592 - Dynamic Models of Infant/Toddler Development (3)
Provides information on typical infant and toddler mental health development and strategies for working with young children and their families within a culturally sensitive context. Includes prenatal and postnatal development, brain development as well as theories of development including attachment, resiliency, and self-regulation are presented from a cross-disciplinary perspective. Content reflects recommended practices across disciplines when working with young children and their families.

CI 596 - Second Language Acquisition and Development for K-12 Educators (3)
Gain historical perspectives on language teaching. Study major concepts, theories, research and variables related to the nature and acquisition of language. Consider individual differences and patterns common to all learners. Collect/analyze natural language from language learners. Construct environments that support ESOL/bilingual students’ language/literacy development and content-area achievement. Also offered for undergraduate-level credit as CI 496 and may be taken only once for credit.
Prerequisite: Admission into the Secondary Graduate Teacher Education Program (GTEP), the Secondary Dual Endorsement Program (SDEP), or the Bilingual Teacher Pathway (BTP) Program.

CI 597 - Assessment of Language and Content Learning for K-12 English Learners (2)
Consider fair, accurate, and meaningful assessment for English learners. Learn about common standards-based assessment instruments. Examine differences between and uses for assessments measuring language proficiency and content area achievement as they affect ESOL and bilingual student learning. Explore issues in classroom-based assessment of ELLs. Also offered for undergraduate-level credit as CI 497 and may be taken only once for credit.
Prerequisite: Admission into the Secondary Graduate Teacher Education Program (GTEP), the Secondary Dual Endorsement Program (SDEP), or the Bilingual Teacher Pathway (BTP) Program.

CI 596 - Second Language Acquisition and Development for K-12 Educators (3)
Gain historical perspectives on language teaching. Study major concepts, theories, research and variables related to the nature and acquisition of language. Consider individual differences and patterns common to all learners. Collect/analyze natural language from language learners. Construct environments that support ESOL/bilingual students’ language/literacy development and content-area achievement. Also offered for undergraduate-level credit as CI 496 and may be taken only once for credit.
Prerequisite: Admission into the Secondary Graduate Teacher Education Program (GTEP), the Secondary Dual Endorsement Program (SDEP), or the Bilingual Teacher Pathway (BTP) Program.

CI 601 - Research (1-9)
(Credit to be arranged.)

CI 602 - Independent Study (1-9)
(Credit to be arranged.)

CI 603 - Dissertation (1-16)
(Credit to be arranged.)

CI 604 - Cooperative Education/Internship (1-9)
(Credit to be arranged.)

CI 605 - Reading and Conference (1-9)
(Credit to be arranged.)

CI 606 - Special Problems/Projects (1-9)
(Credit to be arranged.)

CI 607 - Seminar (1-9)
(Credit to be arranged.)

CI 608 - Workshop (1-9)
(Credit to be arranged.)

CI 609 - Practicum (1-9)
(Credit to be arranged.)

CI 610 - Selected Topics (1-9)
(Credit to be arranged.)

CI 665 - Theoretical Models of Curriculum (3)
Study of the history of curriculum and curriculum theory in the United States. Emphasis is placed on the historical, philosophical, and scientific foundations of curriculum theory. A main goal of the course is to provide a framework for evaluation, selection, and development of school curricula. Also offered as CI 565 and may be taken only once for credit.

CI 681 - Issues in Education (3)
An introduction to the study of contemporary issues which impact teaching and learning environments for K-12 students and their teachers. This course is a graduate seminar in which students will identify critical issues in contemporary education and analyze those issues from a variety of perspectives. Also offered as CI 581 and may be taken only once for credit.

CI 801 - Research (0-9)
(Credit to be arranged.)
CI 802 - Independent Study (0-9)
(Credit to be arranged.)

CI 804 - Cooperative Education/Internship (0-12)
(Credit to be arranged.)

CI 805 - Reading and Conference (0-9)
(Credit to be arranged.)

CI 806 - Special Problems (0-9)
(Credit to be arranged.)

CI 807 - Seminar (0-9)
(Credit to be arranged.)

CI 808 - Workshop (0-9)
(Credit to be arranged.)

CI 809 - Practicum (0-9)
(Credit to be arranged.)

CI 810 - Experimental Course (0-12)
(Credit to be arranged.)

Comm - Communication
Comm 100 - Introduction to Communication (4)
Overview of major topic areas in communication, including models of communication, social uses of language, communication codes - verbal/nonverbal, listening and communication in interpersonal, group, intercultural, public, and mass media contexts. Application of theory through skills development and community focused assessments.

Comm 199 - Special Studies (1-4)
See department for course description.
(Credit to be arranged.)

Comm 200 - Principles of Communication (4)
Introduces the skills and concepts students need for literacy in communication and provides a broad introduction to the perspectives on communication that will be encountered in upper-division Communication courses.

Comm 215 - Introduction to Intercultural Communication (4)
Designed to give a theoretical understanding of the process and role of communication (both mass and interpersonal) when faced with cultural differences and plurality.

Provides a background of classical theories in intercultural communication, and in interdisciplinary areas (cultural studies, gender studies, cultural anthropology, political science, and international development) where culture and communication have been theorized. Discussions will focus on the changing cultural terrain in the United States and upon internationalization and globalization of mass or popular culture as it impacts other parts of the world.

Comm 218 - Interpersonal Communication (4)
Study of communication concepts, processes, and practices in interpersonal contexts with application of principles and concepts to actual interpersonal communication situations. Includes situational management and behavioral repertoire development, verbal/nonverbal code features structuring conversation and relationships, characteristics of functional relational systems, intercultural/inter-ethnic factors.

Comm 220 - Public Speaking (4)
Research, writing, delivery, and listening skills for oral presentation in a variety of settings, including multicultural. Equal consideration given to speech preparation and delivery with critical thinking, argument forms, and audience analysis emphasized. Issues of speech anxiety addressed.

Comm 227 - Nonverbal Communication (4)
The study of nonverbal communication as related to verbal communication. Course emphasis on theories and typologies of nonverbal behavior. Examination of the influence of such factors as para-language, body movement, eye behavior, touch space, time, and physical and social environments. Course requirements include completion and report of a personal research project.

Comm 299 - Special Studies (1-4)
(Credit to be arranged.)

Comm 311 - Research Methods in Communication (4)
Introduction to the assumptions and methods of research in the study of human communication. Students will learn to design and conduct practical research projects and improve their ability to understand, evaluate, and use reports of research and scholarship encountered in future coursework and in everyday life.
Prerequisite: Wr 222 or 333, and Comm 200.

Comm 312 - Media Literacy (4)
Focuses on building critical skills for evaluating mass media, going beyond the ways that messages represent the world to the ways that messages and the institutions that produce them actually constitute the social world. Primary issues include cultural domination and empowerment; public opinion and the legitimizing role of the media; mass culture and ideology; cultural opposition; the political-economy of news media; and the general role of media in political socialization. Extensive in-class and small-group media analysis.

Comm 312U - Media Literacy (4)
Focuses on building critical skills for evaluating mass media, going beyond the ways that messages represent the world to the ways that messages and the institutions that produce them actually constitute the social world. Primary issues include cultural domination and empowerment; public opinion and the legitimizing role of the media; mass culture and ideology; cultural opposition; the political-economy of news media; and the general role of media in political socialization. Extensive in-class and small-group media analysis.

Comm 313 - Communication in Groups (4)
Focuses on communication processes in small, decision-making groups. Students examine the relation between actual communicative behaviors of group members and group structure, functions, and outcomes. Topics include leadership emergence and enactment, quality of problem solving strategies utilized, the impact of socio-cultural and institutional features on small group communicative practices. Theoretical application in the critical analysis of various group settings and effective communication in ongoing group projects.

Comm 313U - Communication in Groups (4)
Focuses on communication processes in small, decision-making groups. Students examine the relation between actual communicative behaviors of group members and group structure, functions, and outcomes. Topics include leadership
emergence and enactment, quality of problem solving strategies utilized, the impact of socio-cultural and institutional features on small group communicative practices. Theoretical application in the critical analysis of various group settings and effective communication in ongoing group projects.

Comm 314 - Persuasion (4)
A consideration of concepts, principles, and theories related to persuasion, and a consideration of the role of persuasive communication in public discourse. Opportunity for practical application of principles in student projects. Sp 100 or Sp 220 recommended.

Comm 314U - Persuasion (4)
A consideration of concepts, principles, and theories related to persuasion, and a consideration of the role of persuasive communication in public discourse. Opportunity for practical application of principles in student projects. Sp 100 or Sp 220 recommended.

Comm 316 - Communication, Individuals, and Discourse (4)
Extends the discussion of empirical approaches to communication introduced in Comm 200. Introduces relevant social science theories of communication including theories based on cognitive, evolutionary, social psychological, constitutive and social cultural approaches. Students will study communication as a process through which individuals mutually shape and are shaped by culture through discourse. Comm 316 is a requirement for the communication major and is recommended as a prerequisite for all 400-level communication courses.

Prerequisite: Comm 200.

Comm 317 - Communicating About Violence and Children (4)
Investigation of endangered and violated children in environments including domestic and global. Threats to children’s safety, survival, quality of life, family or alternative care, education, health and health care, and basic human rights are examined. Trends in public awareness, information systems, organizational advocacy and intervention efforts are assessed for impact and effectiveness. Students will employ specific listening and speaking practices to promote substantive class discussions. Areas of violence investigated include: physical, sexual and verbal abuse; child soldiers; slavery; war; starvation, disease and displacement; teaching hatred; religion used as a weapon; cyber-stalking and bullying.

Comm 317U - Communicating About Violence and Children (4)
Investigation of endangered and violated children in environments including domestic and global. Threats to children’s safety, survival, quality of life, family or alternative care, education, health and health care, and basic human rights are examined. Trends in public awareness, information systems, organizational advocacy and intervention efforts are assessed for impact and effectiveness. Students will employ specific listening and speaking practices to promote substantive class discussions. Areas of violence investigated include: physical, sexual and verbal abuse; child soldiers; slavery; war; starvation, disease and displacement; teaching hatred; religion used as a weapon; cyber-stalking and bullying.

Comm 318 - Family Communication (4)
Focuses on the study of families from a communication perspective; that is, how families create, maintain and reinforce patterns of interaction through daily living, story-telling and other habitual forms of communication. Course applies theoretical frameworks such as family systems theory, social construction theory and dialectical theory to issues of courtship and relational development, the changes in the life of families, and family roles.

Comm 318U - Family Communication (4)
Focuses on the study of families from a communication perspective; that is, how families create, maintain and reinforce patterns of interaction through daily living, story-telling and other habitual forms of communication. Course applies theoretical frameworks such as family systems theory, social construction theory and dialectical theory to issues of courtship and relational development, the changes in the life of families, and family roles.

Comm 320 - Introduction to Political Communication (4)
Communication activities relating directly to the election of candidates and the passage of initiatives. Presented through the context of deliberative democracy and the First Amendment to the U.S. Constitution, which provides a set of "political rules of the road" for democratic processes.

Comm 322 - Mass Communication and Society (4)
A survey of the development of print, broadcast, film, and new communication technology as social, cultural, and economic forces in American society. Examination of news media and their relationship to American political institutions. Discussion of advertising as an economic and popular cultural force. Survey of major trends in media research.

Comm 323 - Introduction to Organizational Communication (4)
The goal of this course is to introduce students to theories that examine how communication works in business contexts. Students will study organizational management, interpersonal conflict and conflict management in organizations. Students will learn to apply course concepts to business interactions and practices. This course is recommended preparation for Comm 423.

Comm 323U - Introduction to Organizational Communication (4)
The goal of this course is to introduce students to theories that examine how communication works in business contexts. Students will study organizational management, interpersonal conflict and conflict management in organizations. Students will learn to apply course concepts to business interactions and practices. This course is recommended preparation for Comm 423.

Comm 326 - Communication, Society, and Culture (4)
Develops the idea that communicative action is theoretically driven; continues the discussion of constitutive and social-cultural theories; distinguishes between normative and social science theories of communication and introduces cultural and critical theories of communication. Comm 326 develops ideas of interpretation and critique that are introduced in Comm 200. The course extends ideas of normative theorizing including interpretive, critical and cultural theories of communication. Comm 326 is a requirement for the communication
major and is recommended as a prerequisite for all 400-level communication courses.

Prerequisite: Comm 200.

Comm 329 - Introduction to Health Communication (4)

Introduces students to the breadth of health communication theory and research. Course topics include provider-patient communication, social support, uncertainty management, health literacy, and health campaigns.

Comm 329U - Introduction to Health Communication (4)

Introduces students to the breadth of health communication theory and research. Course topics include provider-patient communication, social support, uncertainty management, health literacy, and health campaigns.

Comm 336 - Metaphors in Communication (4)

An introduction to the use and understanding of metaphors in conversation, public communication, and mediated communication. Topics include metaphor comprehension, metaphorical framing, patterns of metaphor use in discourse and interaction of metaphors with communication context. No prior familiarity with the metaphor literature is assumed.

Comm 336U - Metaphors in Communication (4)

An introduction to the use and understanding of metaphors in conversation, public communication, and mediated communication. Topics include metaphor comprehension, metaphorical framing, patterns of metaphor use in discourse and interaction of metaphors with communication context. No prior familiarity with the metaphor literature is assumed.

Comm 337 - Communication and Gender (4)

Study and practice of the skills involved in competent communication (primarily comprehensive listening and reading, and speaking and writing) in order to separate myths, assumptions and notions from the facts, realities and truths about communication and about women and men. Examination of communication and gender topics will include: the role of anger in communicating about gender issues; the impact of the type of information on discussions about gender; gender difference as a "catch all" explanation for gender problems; the facts of differences being confused with attitudes about differences; perception of women and men as speaking different languages and communicator behaviors as choices.

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Study and practice of the skills involved in competent communication (primarily comprehensive listening and reading, and speaking and writing) in order to separate myths, assumptions and notions from the facts, realities and truths about communication and about women and men. Examination of communication and gender topics will include: the role of anger in communicating about gender issues; the impact of the type of information on discussions about gender; gender difference as a "catch all" explanation for gender problems; the facts of differences being confused with attitudes about differences; perception of women and men as speaking different languages and communicator behaviors as choices.

Comm 341 - Introduction to Public Relations (4)

An introduction to the principles and practice of professional public relations, focusing on the functions of PR in organizations, the concept of strategic communication in persuasion, relevant professional skills, the role of research, and an understanding of common ethical issues encountered.

Comm 346 - Humor, Irony, and Laughter in Communication (4)

An introduction to theories of humor, irony, and laughter from social-interactional perspectives. Particular attention is given to how humor, irony, and laughter are used and understood in conversation and other forms of discourse.

Prerequisite: Comm 200 or appropriate SINQ.

Comm 362 - Bollywood: Communicating Contemporary South Asia through Cinema (4)

Bollywood is a spectrum of major media industries in India and South Asia that produce entertainment for worldwide consumption. Bollywood is a recent term that highlights the transnational character of the industry, very much like Hollywood. Specifically we will examine transnational Indian Cinema with the following emphases: 1. globalization and the politics of transnational film production, distribution, and reception; 2. local-regional-global dynamics; 3. the construction and negotiation of gender, family, nation, religion/communalism, and emerging new filmic genres; 4. issues of filmic representation and diasporic identities.

Comm 362U - Bollywood: Communicating Contemporary South Asia through Cinema (4)

Bollywood is a spectrum of major media industries in India and South Asia that produce entertainment for worldwide consumption. Bollywood is a recent term that highlights the transnational character of the industry, very much like Hollywood. Specifically we will examine transnational Indian Cinema with the following emphases: 1. globalization and the politics of transnational film production, distribution, and reception; 2. local-regional-global dynamics; 3. the construction and negotiation of gender, family, nation, religion/communalism, and emerging new filmic genres; 4. issues of filmic representation and diasporic identities.

Comm 370 - Debate and Forensics (4)

Development of advanced public speaking and argumentation skills. Each student will attend college tournaments and engage in a variety of forensics events, including platform speeches, limited-preparation speeches, interpretive speeches, and team debate.

Comm 370U - Debate and Forensics (4)

Development of advanced public speaking and argumentation skills. Each student will attend college tournaments and engage in a variety of forensics events, including platform speeches, limited-preparation speeches, interpretive speeches, and team debate.
to all communication events. Reveals how communication can either validate or undermine the basic humanity, dignity and value of others in the communication setting.

Prerequisite: junior standing, open to those outside of communication.

Comm 389U - Ethics of Human Communication (4)

Applies important ethical theories to communication settings and problems, including aspects of interpersonal, group, organization, public, Internet and mass communication, showing how ethics relate to all communication events. Reveals how communication can either validate or undermine the basic humanity, dignity and value of others in the communication setting.

Prerequisite: junior standing, open to those outside of communication.

Comm 399 - Special Studies (1-6)

See department for course description. (Credit to be arranged.)

Comm 401 - Research (1-12)

Consent of instructor. Communication Laboratory. See department for course description. (Credit to be arranged.)

Comm 404 - Cooperative Education/Internship (1-12)

See department for course description. (Credit to be arranged.)

Comm 405 - Reading and Conference (1-12)

Consent of instructor. See department for course description. (Credit to be arranged.)

Comm 406 - Special Projects (1-8)

Consent of instructor. See department for course description. (Credit to be arranged.)

Comm 407 - Seminar (1-12)

See department for course description. (Credit to be arranged.)

Comm 408 - Workshop (1-6)

See department for course description. (Credit to be arranged.)

Comm 409 - Practicum (1-12)

See department for course description. (Credit to be arranged.)

Comm 410 - Selected Topics (1-6)

See department for course description. (Credit to be arranged.)

Comm 412 - Empirical Theories of Mass Communication (4)

Surveys social scientific theories of mass communication. Also offered for graduate-level credit as Comm 512 and may be taken only once for credit.

Prerequisite: upper-division standing.

Comm 415 - Problems of Intercultural Communication (4)

Builds upon the theories and issues discussed in the introductory course by including contemporary and classical literature on multicultural and intercultural communication. Identifies and analyzes politically constructed categories of race, age, class, gender in society against the backdrop of debates on multiculturalism in the United States. Examines categorizations of race, class, etc. in their historical, social, and cultural context, and how those have influenced mass-mediated and interpersonal communication. Uses mass media (television, radio, daily print media, music) texts to provide examples of how we understand "difference" and "otherness" in our daily lives. Also offered for graduate-level credit as Comm 515 and may be taken only once for credit.

Prerequisite: upper-division standing.

Comm 418 - Advanced Interpersonal Communication (4)

Theory course in which students analyze current concepts and theories related to inter-personal communication, comparing and contrasting various models and their relative adequacy in representing the complexity of communication processes. The impact on actual communicative practices is examined. The influence of particular historical perspectives and contemporary issues and trends in interpersonal communication is analyzed through evaluation of empirical data and general cultural texts. Research project required. Also offered for graduate-level credit as Comm 518 and may be taken only once for credit.

Prerequisite: upper-division standing.

Comm 420 - Political Communication (4)

An analysis of the relationship of communication to the exercise of politics and political power. Topics may include the ethics and practices of electoral politics, political ideologies, political advertising, propaganda, public opinion formation, the role of mass media as a source and form of political communication, speech writing, public policy writing and analysis, political news writing, and political campaigning. The focus is on how communication strategies and media can be used to organize consent or dissent to ruling parties, representatives, and ideas. Also offered for graduate-level credit as Comm 520 and may be taken only once for credit.

Prerequisite: upper-division standing.

Comm 422 - Critical Theories in Mass Communication (4)

Surveys critical and institutional theories of mass communication. Primary focus is an analysis of the relationship between media and communication institutions and the state and other social institutions. Also offered for graduate-level credit as Comm 522 and may be taken only once for credit.

Prerequisite: upper-division standing.

Comm 423 - Advanced Organizational and Strategic Communication (4)

Application of communication theory to the study of human interaction in the organizational context. Examination of the relationships between structural variables in the organization and informal
communication channels, organizational culture, and strategic communication. Course requirements include completion and report of a research project. Also offered for graduate-level credit as Comm 523 and may be taken only once for credit.

Prerequisite: upper-division standing. Expected preparation: core communication courses (Comm 200, Comm 311, Comm 316, Comm 326), and Comm 313 - Communication in Groups or Comm 323 - Introduction to Organizational Communication.

Comm 427 - Issues in International Communication (4)
A study of historical and contemporary theories and practices in the conduct of trans-border communication. Topics may include international communication issues of law, diplomacy, conflict, the Cold War, international organizations, mass media, information, advertising and news flows, and social-economic development, as well as discussions of specific cases of cultural and institutional communication, spoken, written and produced, in various industrial and developing societies. Also offered for graduate-level credit as Comm 527 and may be taken only once for credit.

Prerequisite: upper-division standing. Expected preparation: core communication courses (Comm 200, Comm 311, Comm 316, Comm 326), and Comm 215 - Introduction to Intercultural Communication.

Comm 429 - Health Communication Campaigns (4)
In-depth examination of health communication campaigns that promote behavior change using theories at the individual, interpersonal, small group, and community levels. We will explore the current media environment, in which health communication campaigns can utilize a variety of communication channels including mobile phones, social networks, video games, and entertainment television. Also offered for graduate-level credit as Comm 529 and may be taken only once for credit.

Prerequisite: upper-division standing. Expected preparation: core communication courses (Comm 200, Comm 311, Comm 316, Comm 326), and Comm 314 – Persuasion or Comm 329 - Introduction to Health Communication.

Comm 436 - Communication and Cognition (4)
Exploration of human communication from a cognitive perspective. Also offered for graduate-level credit as Comm 536 and may be taken only once for credit.

Prerequisite: upper-division standing. Expected preparation: core communication courses (Comm 200, Comm 311, Comm 316, Comm 326).

Comm 437 - Urban Communication (4)
Course utilizes a cultural, contextual approach to the study of urban communication structures, processes and practices. Macro and micro features are examined with the goal of understanding the role of communication in structuring social life in urban environments. Relevant theories on urban life and multiple dimensions of verbal and nonverbal communication codes are examined as they apply in urban contexts. Theoretical and empirical approaches recognize urban centers as dynamic multicultural environments. Research project required. Also offered for graduate-level credit as Comm 537 and may be taken only once for credit.

Prerequisite: upper-division standing. Expected preparation: core communication courses (Comm 200, Comm 311, Comm 316, Comm 326), and Comm 322 - Mass Comm & Society.

Comm 438 - Everyday Talk: Structure and Process (4)
How humans use gesture and vocal intonation in conversation, with a primary emphasis on informal settings, interaction of gesture with language, metaphorical aspects of gesture, and the contribution of gesture to cognitive and interactive processes of message origination and interpretation. Also offered for graduate-level credit as Comm 539 and may be taken only once for credit. Expected preparation: Comm 311 or equivalent; upper-division or graduate standing.

Comm 439 - Gesture and Meaning in Everyday Talk (4)
How humans use gesture and vocal intonation in conversation, with a primary emphasis on informal settings, interaction of gesture with language, metaphorical aspects of gesture, and the contribution of gesture to cognitive and interactive processes of message origination and interpretation. Also offered for graduate-level credit as Comm 539 and may be taken only once for credit. Expected preparation: Comm 311 or equivalent; upper-division or graduate standing.

Comm 440 - Metaphor, Play, and Humor (4)
How metaphor, play, humor, and other forms of "non-serious" language and gesture contribute to the creation of meaning and sustaining of relationships in everyday social interactions. Topics vary from quarter to quarter, and may include: metaphor; playful communication; humor and irony; and narratives. May be repeated for undergraduate or graduate credit. Also offered for graduate-level credit as Comm 540 and may be taken only once for credit.

Prerequisite: upper-division standing. Expected preparation: core communication courses (Comm 200, Comm 311, Comm 316, Comm 326), and Comm 336 - Metaphors in Communication.

Comm 452 - Gender and Race in the Media (4)
Primarily examines the representations of gender and race, including age, class and sexual orientation in various media (mainstream and alternative), and will examine theoretical and methodological approaches which may be used to interpret these representations. In addition, considers the potential impact that media institutions have on people's lives, political decisions and social relations. The overall aim is for students to understand how their own cultural identities affect their media consumption and social positioning. Also offered as WS 452 and for graduate-level credit as Comm 552 and may be taken only once for credit. Expected preparation: core communication courses (Comm 200, Comm 311, Comm 316, Comm 326), and Comm 322.

Prerequisite: upper-division standing. Crosslisted as: WS 452.
Comm 460 - Framing and Mass Media (4)
Examines how messages are constructed and the effects frames have on audiences. Framing theory is linked to propaganda, public relations, marketing, political communication and cognition, and has a rich theoretical and methodological tradition. Examines the conceptual definitions, and the underpinning theory and methodology used in framing scholarship. Agenda setting, bias and framing, public opinion formation, cultivation analysis, behavioral effects, and macrolevel and microlevel methods are also examined. Also offered for graduate-level credit as Comm 560 and may be taken only once for credit.
Prerequisite: upper-division standing. Expected preparation: core communication courses (Comm 200, Comm 311, Comm 316, Comm 326), and Comm 322 - Mass Comm & Society.

Comm 472 - Communication and Public Opinion Seminar (4)
This course explores research questions that relate to mass communication and American public opinion. Important normative and philosophical issues are identified and reviewed via early writings (ca. 1900) in social philosophy and social science. These issues are further investigated by examining relevant work from sociology, social psychology, and mass communication. Also offered for graduate-level credit as Comm 572 and may be taken only once for credit.
Prerequisite: upper-division standing. Expected preparation: core communication courses and Comm 314 Persuasion.

Comm 487 - Propaganda, Public Relations, and Media (4)
The course encourages students to think critically about how mass media promote ideologies and agendas to influence opinion, policies and sales. Theories of media effects, propaganda and public relations explored. Also offered for graduate-level credit as Comm 587 and may be taken only once for credit.
Prerequisite: upper-division standing with expected preparation in mass media and persuasion theories.

Comm 489 - Media Ethics (4)
Applies important ethical theories to decision making within the mass media, including considerations of personal, organizational, professional and cultural understandings of ethics to analyze how decisions regarding media content are made. Provides guidelines for identifying and understanding ethical dilemmas commonly encountered by media professionals and help in making theory-grounded decisions in print and broadcast journalism, advertising and public relations, the Internet, and entertainment media.
Prerequisite: junior, senior or graduate standing.

Comm 501 - Research (1-9)
Consent of instructor. Communication Laboratory. See department for course description. (Credit to be arranged.)

Comm 502 - Independent Study (1-6)
(Credit to be arranged.)

Comm 503 - Thesis (1-9)
See department for course description. (Credit to be arranged.)

Comm 504 - Cooperative Education/Internship (1-9)
See department for course description. (Credit to be arranged.)

Comm 505 - Reading and Conference (1-9)
Consent of instructor. See department for course description. (Credit to be arranged.)

Comm 506 - Special Projects (1-8)
See department for course description. (Credit to be arranged.)

Comm 507 - Seminar (1-6)
See department for course description. (Credit to be arranged.)

Comm 508 - Workshop (0-6)
See department for course description. (Credit to be arranged.)

Comm 509 - Practicum (1-9)
See department for course description. (Credit to be arranged.)

Comm 510 - Selected Topics (1-6)
See department for course description. (Credit to be arranged.)

Comm 511 - Introduction to Communication Theory (4)
Introduction to the theoretical perspectives currently represented in the department, with attention to meta-theoretical considerations including ontology, epistemology, and axiology, and how these considerations shape the understanding of key concepts. Students will learn to critique and synthesize theoretical literature within each perspective.

Comm 512 - Empirical Theories of Mass Communication (4)
Surveys social scientific theories of mass communication. Also offered for undergraduate-level credit as Comm 412 and may be taken only once for credit.
Prerequisite: upper-division standing. Expected preparation: core communication courses (Comm 200, Comm 311, Comm 316, Comm 326), and Comm 322 – Mass Communication & Society.

Comm 513 - Seminar: Communication in Institutional Contexts (4)
Various configurations and features of institutional life are examined. The impact of culture, politics, media on organizational communicative structures and processes, communication consultation, institutional-community interface are among the topics covered. Current research is examined. Students conduct an organizational research project.
Prerequisite: graduate standing or instructor permission. Repeatable for credit.

Comm 514 - Topics in Communication, Culture, and Community (4)
Examination and analysis of human symbolic activity as the management of meaning, with the capacity to shape and influence thought, action, and world view. Particular attention given to assumptions regarding intent, effects, meaning, understanding, and interpretation, and their implications for studying communication from modernist and post-modernist perspectives. Specific topics vary with instructor. May be repeated for graduate credit.

Comm 515 - Problems of Intercultural Communication (4)
Builds upon the theories and issues discussed in the introductory course by including contemporary and classical
literature on multicultural and intercultural communication. Identifies and analyzes politically constructed categories of race, age, class, gender in society against the backdrop of debates on multiculturalism in the United States. Examines categorizations of race, class, etc. in their historical, social, and cultural context, and how those have influenced mass-mediated and interpersonal communication. Uses mass media (television, radio, daily print media, music) texts to provide examples of how we understand "difference" and "otherness" in our daily lives. Also offered for undergraduate-level credit as Comm 415 and may be taken only once for credit.

Prerequisite: upper-division standing.

Comm 518 - Advanced Interpersonal Communication (4)

Theory course in which students analyze current concepts and theories related to inter-personal communication, comparing and contrasting various models and their relative adequacy in representing the complexity of communication processes. The impact on actual communicative practices is examined. The influence of particular historical perspectives and contemporary issues and trends on interpersonal communication is analyzed through evaluation of empirical data and general cultural texts. Research project required. Also offered for undergraduate-level credit as Comm 418 and may be taken only once for credit.

Comm 520 - Political Communication (4)

An analysis of the relationship of communication to the exercise of politics and political power. Topics may include the ethics and practices of electoral politics, political ideologies, political advertising, propaganda, public opinion formation, the role of mass media as a source and form of political communication, speech writing, public policy writing and analysis, political news writing, and political campaigning. The focus is on how communication strategies and media can be used to organize onset or dissent to ruling parties, representatives, and ideas. Also offered for undergraduate-level credit as Comm 420 and may be taken only once for credit.

Prerequisite: upper-division standing.

Comm 521 - Quantitative Methods in Communication Research (4)

An examination of the methods of quantitative empirical research in communication. Emphasis is upon selected research designs, data collection and analysis, data input for computer analysis with statistical packages, results interpretation, and writing reports of completed research.

Comm 522 - Critical Theories in Mass Communication (4)

Surveys critical and institutional theories of mass communication. Primary focus is analysis of the relationship between media and communication institutions and the state and other social institutions. Also offered for undergraduate-level credit as Comm 422 and may be taken only once for credit.

Prerequisite: upper-division standing.

Comm 523 - Advanced Organizational and Strategic Communication (4)

Application of communication theory to the study of human interaction in the organizational context. Examination of the relationships between structural variables in the organization and informal communication channels, organizational culture, and strategic communication. Course requirements include completion and report of a research project. Also offered for undergraduate-level credit as Comm 423 and may be taken only once for credit.

Prerequisite: upper-division standing.

Comm 524 - Issues in International Communication (4)

A study of historical and contemporary theories and practices in the conduct of trans-border communication. Topics may include international communication issues of law, diplomacy, conflict, the Cold War, international organizations, mass media, information, advertising and news flows, and social-economic development, as well as discussions of specific cases of cultural and institutional communication, spoken, written and produced, in various industrial and developing societies. Also offered for undergraduate-level credit as Comm 427 and may be taken only once for credit.

Prerequisite: upper-division standing.

Comm 525 - International Communication (4)

Study and analysis of the international dimensions of communication. Focus is on understanding the cultural and power contexts and differences among and between peoples and institutions that establish the boundaries in the exchange of meanings, values, and ideas. Emphasis is given to questions of cultural, economic and political sovereignty in the pursuit of national, regional, and personal identity and development.

Comm 526 - Health Communication (4)

In-depth examination of health communication campaigns that promote
behavior change using theories at the individual, interpersonal, small group, and community levels. We will explore the current media environment, in which health communication campaigns can utilize a variety of communication channels including mobile phones, social networks, video games, and entertainment television. Also offered for undergraduate-level credit as Comm 429 and may be taken only once for credit.

Prerequisite: upper-division standing.

Comm 531 - Qualitative Methods in Communication Research (4)

An examination of naturalistic empirical communication research and the assumptive bases. Particular attention given to descriptive, interpretive, and critical approaches for analysis, and to specific methods of participant observation, interviewing, and textual analysis. Critical examination of selected research as models for original student research.

Prerequisite: Comm 511.

Comm 533 - Seminar: Organizational Communication (4)

Examines the implications of evolving perspectives in organizational theory, as well as cultural factors which may influence communication processes in the organizational context. Different approaches to assessing organizational communication processes are considered with relevance to enhancing organizational effectiveness and facilitating organizational transition and change. Course requirements include completion and report of a research project.

Comm 536 - Communication and Cognition (4)

Exploration of human communication from a cognitive perspective. Also offered for undergraduate-level credit as Comm 436 and may be taken only once for credit.

Prerequisite: upper-division standing.

Comm 537 - Urban Communication (4)

Course utilizes a cultural, contextual approach to the study of urban communication structures, processes and practices. Macro and micro features are examined with the goal of understanding the role of communication in structuring social life in urban environments. Relevant theories on urban life and multiple dimensions of verbal and nonverbal communication codes are examined as they apply in urban contexts. Theoretical and empirical approaches recognize urban centers as dynamic multicultural environments. Research project required. Also offered for undergraduate-level credit as Comm 437 and may be taken only once for credit.

Prerequisite: upper-division standing.

Comm 538 - Everyday Talk: Structure and Process (4)

How humans organize talk, with a primary emphasis on face-to-face talk in an informal setting. Attention will be given to the structure of roles and turns, sequencing of stages and topics, issues of common ground and relevance, and cognitive processes of message origination and interpretation in particular contexts. Also offered for undergraduate-level credit as Comm 438 and may be taken only once for credit.

Prerequisite: upper-division standing.

Comm 539 - Gesture and Meaning in Everyday Talk (4)

How humans use gesture and vocal intonation in conversation, with a primary emphasis on informal settings, interaction of gesture with language, metaphorical aspects of gesture, and the contribution of gesture to cognitive and interactive processes of message origination and interpretation. Also offered for undergraduate-level credit as Comm 439 and may be taken only once for credit. Expected preparation: Comm 311 or equivalent; upper-division or graduate standing.

Comm 540 - Metaphor, Play, and Humor (4)

How metaphor, play, humor, and other forms of “non-serious” language and gesture contribute to the creation of meaning and sustaining of relationships in everyday social interactions. Topics vary from quarter to quarter, and may include: metaphor; playful communication; humor and irony; and narratives. May be repeated for undergraduate or graduate credit. Also offered for undergraduate-level credit as Comm 440 and may be taken only once for credit.

Prerequisite: upper-division standing.

Comm 541 - Methods of Rhetorical Criticism (4)

An examination of philosophical and conceptual bases of contemporary rhetorical theory and their implications for the conduct of rhetorical criticism. Selected approaches to criticism examined, along with exemplars for analysis. Special attention given to critical invention, and to the social positioning of the critic. Students will select and examine a specific example of contemporary rhetoric.

Prerequisite: Sp 511.

Comm 552 - Gender and Race in the Media (4)

Primarily examines the representations of gender and race, including age, class and sexual orientation in various media (mainstream and alternative), and will examine theoretical and methodological approaches which may be used to interpret these representations. In addition, considers the potential impact that media institutions have on people’s lives, political decisions and social relations. The overall aim is for students to understand how their own cultural identities affect their media consumption and social positioning. Also offered for undergraduate-level credit as Comm 452 and is the same course as WS 552; may be taken only once for credit.

Crosslisted as: WS 552.
Comm 556 - Seminar: Topics in Language, Meaning, and Interpretation (4)
Exploration of cognitive, linguistic, and interpretive approaches of emerging interest in the study of human communication. Specific topics vary with instructor. May be repeated for graduate credit.
Prerequisite: graduate standing.

Comm 560 - Framing and Mass Media (4)
Examines how messages are constructed and the effects frames have on audiences. Framing theory is linked to propaganda, public relations, marketing, political communication and cognition, and has a rich theoretical and methodological tradition. Examines the conceptual definitions, and the underpinning theory and methodology used in framing scholarship. Agenda setting, bias and framing, public opinion formation, cultivation analysis, behavioral effects, and macrolevel and microlevel methods are also examined. Also offered for undergraduate-level credit as Comm 460 and may be taken only once for credit.
Prerequisite: upper-division standing.
Expected preparation: core communication courses (Comm 200, Comm 311, Comm 316, Comm 326), and Comm 322 - Mass Comm & Society .

Comm 572 - Communication and Public Opinion Seminar (4)
This course explores research questions that relate to mass communication and American public opinion. Important normative and philosophical issues are identified and reviewed via early writings (ca. 1900) in social philosophy and social science. These issues are further investigated by examining relevant work from sociology, social psychology, and mass communication. Also offered for undergraduate-level credit as Comm 472 and may be taken only once for credit.
Prerequisite: upper-division standing.
Expected preparation: core communication courses and Comm 314 Persuasion.

Comm 587 - Propaganda, Public Relations, and Media (4)
The course encourages students to think critically about how mass media promote ideologies and agendas to influence opinion, policies and sales. Theories of media effects, propaganda and public relations explored. Also offered for undergraduate-level credit as Comm 487 and may be taken only once for credit.
Prerequisite: upper-division standing with expected preparation in mass media and persuasion theories.

Comm 589 - Media Ethics (4)
Applies important ethical theories to decision making within the mass media, including considerations of personal, organizational, professional and cultural understandings of ethics to analyze how decisions regarding media content are made. Provides guidelines for identifying and understanding ethical dilemmas commonly encountered by media professionals and help in making theory-grounded decisions in print and broadcast journalism, advertising and public relations, the Internet, and entertainment media.
Prerequisite: junior, senior or graduate standing.

Coun - Counseling
Coun 199 - Special Studies (1-4)
(Credit to be arranged.)
Coun 401 - Research (1-6)
(Credit to be arranged.)
Coun 402 - Independent Study (1-9)
(Credit to be arranged.)
Coun 403 - Thesis (1-6)
(Credit to be arranged.)
Coun 405 - Reading and Conference (1-6)
(Credit to be arranged.)
Coun 406 - Special Problems (1-6)
(Credit to be arranged.)
Coun 407 - Seminar (1-6)
(Credit to be arranged.)
Coun 408 - Workshop (1-6)
(Credit to be arranged.)
Coun 409 - Practicum (1-12)
(Credit to be arranged.)
Coun 410 - Experimental Course (1-6)
(Credit to be arranged.)

Coun 425 - Guidance for the Classroom Teacher (3)
A study of the responsibilities and procedures of teachers for guiding students at all levels in becoming more effective and capable persons. Also offered for graduate-level credit as Coun 525 and may be taken only once for credit. Expected preparation: completion of 135 credits; student teaching or teaching experience.

Coun 430 - Introduction to Psychiatric Diagnoses (3)
Covers the causation, criteria, diagnosis and classification of the major psychiatric disorders. Emphasis is placed on both the traditional medical model and on the psychosocial model of diagnosis. Developmental aspects associated with normal and abnormal personalities will also be discussed. This course is a prerequisite for the Counselor Education graduate programs and will not be credited toward the completion of the degrees. Also offered for graduate-level credit as Coun 530 and may be taken only once for credit. Expected preparation: Psy 311.

Coun 437 - Current Issues in Addictions Counseling (3)
Presentation of current issues and new developments in the treatment of substance abusing clients. Emphasis is on new knowledge from research and current trends in treatment with particular focus on the interface between chemical dependency and mental health. Also offered for graduate-level credit as Coun 537 and may be taken only once for credit.

Coun 441 - Introduction to Counseling (3)
This course provides an introduction to the counseling profession. Specifically, it focuses on introducing theories and skills related to working with individuals, groups, and families across a variety of settings. It also provides an introduction to various career and educational options within the counseling profession. Also offered for graduate-level credit as Coun 541 and may be taken only once for credit.

Coun 445 - Youth at Risk (3)
Designed to provide participants with an overview of information focused on counseling and teaching youth-at-risk. Emphasis will be placed on identifying youth-at-risk for depression, suicide, eating...
Disorders, pregnancy, AIDS, use and abuse of alcohol and drugs, homelessness, gang membership and several other at-risk behaviors. Ideas for primary, secondary and tertiary prevention from individual, family, school and community perspectives will also be presented. Particular attention will be paid to guidelines for development of tragedy response plans for school campuses in conjunction with the topic of tertiary prevention. Presented in a varied format structured to include lecture/discussion, audio-visual presentations, participant self-evaluation of their own at-risk behaviors, role-plays and small group discussion. Also offered for graduate-level credit as Coun 545 and may be taken only once for credit.

Coun 501 - Research (1-9)
(Credit to be arranged.)

Coun 502 - Independent Study (1-9)
(Credit to be arranged.)

Coun 503 - Thesis (1-9)
(Credit to be arranged.)

Coun 504 - Internship (1-9)
(Credit to be arranged.)

Coun 505 - Reading and Conference (1-6)
(Credit to be arranged.)

Coun 506 - Special Problems (1-6)
(Credit to be arranged.)

Coun 507 - Seminar (1-6)
(Credit to be arranged.)

Coun 508 - Workshop (1-6)
(Credit to be arranged.)

Coun 509 - Practicum (1-15)
(Credit to be arranged.)

Coun 510 - Experimental Course (1-12)
(Credit to be arranged.)

Coun 520 - Collaborative Partnerships to Support Infants and Toddlers (1-3)
Development and maintenance of effective partnerships among service providers and their respective systems is fundamental to the provision of quality services for infants, young children and their families. Students will examine systems of care and the impact of different systems from the perspective of family and community.

Coun 525 - Guidance for the Classroom Teacher (3)
A study of the responsibilities and procedures of teachers for guiding students at all levels in becoming more effective and capable persons. Also offered for undergraduate-level credit as Coun 425 and may be taken only once for credit. Expected preparation: completion of 135 credits; student teaching or teaching experience.

Coun 526 - Effective Teaching (2)
Designed to meet the education and student teaching requirements for track II school counseling students. Topics covered include effective teaching strategies designed to help school counselors-in-training to meet the TSPC prescribed teaching competencies: planning for instruction, establishing a classroom climate conducive to learning, implementing instructional plans, evaluating pupil achievement, fostering professional relationships, and addressing organizational expectations. Students are required to complete a 200-hour teaching practicum in the field (125 hours of observation and 75 hours as classroom teacher) and complete a work sample. Students are expected to complete two credits per term during one school year for a total of six credits. Restricted to students admitted to the track II school counselor specialization.

Coun 527 - Counseling Individuals with Diverse Needs (3)
Designed to prepare counselors to provide collaborative services for individuals with diverse needs in elementary, secondary, and postsecondary educational settings. Topics will include an overview of the legal mandates that impact educational requirements and services for students with disabilities, including eligibility and various types of disabling conditions related to educational success. Issues related to counseling students and family members, transitional planning, and collaborating with special educators and other service providers will also be covered.

Coun 530 - Introduction to Psychiatric Diagnoses (3)
Covers the causation, criteria, diagnosis and classification of the major psychiatric disorders. Emphasis is placed on both the traditional medical model and on the psychosocial model of diagnosis. Developmental aspects associated with normal and abnormal personalities will also be discussed. This course is a prerequisite for the Counselor Education graduate programs and will not be credited toward the completion of the degrees. Also offered for undergraduate-level credit as Coun 430 and may be taken only once for credit. Expected preparation: Psy 311.

Coun 531 - Foundations of Addictions Counseling (3)
Provides an overview of the biological, psychological, social, and spiritual dimensions of substance use disorders. Emphasizes the developmental course of addictions and the relationship of addictive behavior to common psychological disorders. Models and theories of addictive behavior that counselors need to treat clients with addictive and co-occurring disorders are reviewed.

Coun 532 - Assessment and Diagnosis in Addictions Counseling (3)
Focuses on the development of the knowledge and skills of assessment and diagnosis of psychoactive substance use disorders. The elements of the biopsychosocial assessment process, including basic interviewing and motivational interviewing skills, will be reviewed, as well as standardized screening and assessment instruments for chemical dependency.

Coun 533 - Treatment of Substance Use Disorders I (3)
Focuses on the development of the knowledge and skills of treatment planning and implementation of individualized treatment for psychoactive substance use disorders. Students will review the various modalities of substance use disorder treatment along with the efficacy and indications of each modality. This is the first course in a sequence of two: Coun 533, Coun 534 and must be taken in sequence.

Prerequisite: Coun 532.
Coun 534 - Treatment of Substance Use Disorders II (3)
Focuses on the development of the knowledge and skills of substance use disorder treatment for diverse client populations. Includes HIV/infectious diseases and how to complete a risk assessment. Examines the ethical and professional issues involved in addictions counseling. Focuses on practical skills including documentation, treatment
planning, and clinical interventions. This is the second course in a sequence of two: Coun 533, Coun 534 and must be taken in sequence.

Prerequisite: Coun 533.

Coun 535 - Co-Occurring Disorders (3)
Focuses on helping individuals who suffer from co-occurring psychiatric and substance use disorders by examining state of the art treatment approaches and the public policy and program management challenges that exist in responding to this complex population.

Prerequisite: Coun 531.

Coun 536 - Addictions Counseling Capstone (3)
Merges theoretical components of addiction treatment with practical applications. Students practice counseling skills through role-plays of client issues. Practice domains include individual and group counseling skills, counseling diverse populations, and working with co-occurring disorders.

Prerequisite: Coun 534.

Coun 537 - Current Issues in Addictions Counseling (3)
Presentation of current issues and new developments in the treatment of substance abusing clients. Emphasis is on new knowledge from research and current trends in treatment with particular focus on the interface between chemical dependency and mental health. Also offered for undergraduate-level credit as Coun 437 and may be taken only once for credit.

Coun 541 - Introduction to Counseling (3)
This course provides an introduction to the counseling profession. Specifically, it focuses on introducing theories and skills related to working with individuals, groups, and families across a variety of settings. It also provides an introduction to various career and educational options within the counseling profession. Also offered for undergraduate-level credit as Coun 441 and may be taken only once for credit.

Coun 543 - Interpersonal Relations II (3)
Focuses on the development of foundational active listening, counseling skills. The course is taken concurrently with Coun 509 Practicum Counseling.

Coun 544 - Consultation: Theory and Practice (2)
Focus on the theory and practice of consultation and collaboration with various populations (e.g., parents, families, clinical practitioners) and across a variety of settings, particularly mental health agencies and schools. Class time will include lecture/discussions, experiential exercises, and student group presentations.

Prerequisite: graduate standing.

Coun 545 - Youth at Risk (3)
Designed to provide participants with an overview of information focused on counseling and teaching youth-at-risk. Emphasis will be placed on identifying youth-at-risk for depression, suicide, eating disorders, pregnancy, AIDS, use and abuse of alcohol and drugs, homelessness, gang membership and several other at-risk behaviors. Ideas for primary, secondary and tertiary prevention from individual, family, school and community perspectives will also be presented. Particular attention will be paid to guidelines for development of tragedy response plans for school campuses in conjunction with the topic of tertiary prevention. Presented in a varied format structured to include lecture/discussion, audio-visual presentations, participant self-evaluation of their own at-risk behaviors, role-plays and small group discussion. Also offered for undergraduate-level credit as Coun 445 and may be taken only once for credit.

Coun 546 - Grief and Loss (2)
Focus on developing knowledge and skills related to counseling individuals and families having experienced loss through death. Students will receive information about theories of grief, explore the neurobiology of the brain in relation to trauma, recognize factors that complicate grief and develop counseling strategies for working with these issues.

Prerequisite: graduate standing.

Coun 547 - Legal & Ethical Issues in School Counseling (1)
Focus on the legal and ethical considerations specifically related to the practice of school counseling. Class time will include lecture/discussions, experiential exercises, and completion of case vignettes related to common legal and ethical issues.

Prerequisite: graduate standing.

Coun 551 - Theories and Interventions I (3)
This course focuses on providing an overview of counseling theories and their practical applications with various populations. The emphasis will be on learning the key concepts of each major theory across three dimensions: (a) human nature, (b) pathology, and (c) treatment. Focus will also be on conceptually applying each theory to client cases and understanding underlying values and common elements across theories. Graduate standing is a prerequisite for this class.

Coun 552 - Theories and Interventions II (3)
This course focuses on providing an overview of advanced and contemporary counseling theories and their practical applications with various populations. The emphasis will be on learning the key concepts of each major theory across three dimensions: (a) human nature, (b) pathology, and (c) treatment. Focus will also be on conceptually applying each theory to client cases. Completion of Coun 551 is a prerequisite for this class.

Coun 553 - Advanced Therapeutic Strategies (3)
Focuses on advanced interventions for clients seeking personal counseling. Emphasis is focused upon cognitive-behavioral, brief therapy, and selected experiential interventions and their use in treatment planning. The theory and research connected with the application of these interventions in the treatment planning process is also addressed.

Prerequisite: Coun 551, 552.

Coun 555 - Counseling Children and Youth (3)
Theoretical overview of growth and development of children and youth. Emphasis on translating theory into practice through a "person environment interaction" conception of counseling, consultation, and educational intervention in school settings.

Coun 566 - Appraisal Instruments (1)
Accompanies Coun 567 and is intended to be an evaluation and application practicum of tests used in each counselor education
Coun 567 - Using Tests in Counseling (3)

The course is a graduate level introduction to testing. It offers the student the option of test usage in the counseling process and introduces issues related to such usage. In addition, the course acquaints the student, through hands-on experience, with test taking, scoring, norming, profiling and interpreting.

Prerequisite: Coun 541.

Coun 568 - Career and Lifestyle Planning (3)

This course examines the theoretical research foundation for career choices, factors that influence choices, the role of information, the skills and practices of effective helpers, the exploration/testing/labor market information sources which contribute to the value choices that are made, and related issues and problems.

Prerequisite: admission to the program and Coun 541.

Coun 569 - Developmental Foundations of Counseling (3)

Theoretical overview of life-span growth and development, emphasizing cognitive-intellectual, cognitive-moral, emotional-self, and social aspects of developmental growth in the human being. Emphasis on translating theory into practice through a “person-environment interaction” conception of counseling, consultation, and educational intervention.

Coun 570 - Ethical and Legal Issues in Counseling (3)

Designed to further develop the professional identity of counselors by studying the content and application of the ethical standards of the American Counseling Association, the American Psychological Association, and related professional organizations. Also addresses legal issues in counseling and laws that affect the practice of counseling. Course content includes respecting diversity; client welfare; informed consent; confidentiality and privileged communication; records, technology, and court subpoenas; competence and malpractice; boundary issues; child and adolescent clients; family and group counseling; evaluation, testing, and diagnosis; supervision and consultation, conducting research and methods of resolving ethical and legal issues.

Coun 571 - Group Counseling (3)

This course is designed to provide students with opportunities to learn about group counseling theories and skills. Particular emphasis will be placed on understanding group dynamics and leadership skills as they may apply to different populations and settings. Class time will include lecture/discussion and group-based experiential learning.

Coun 572 - Systemic Perspectives on Human Sexuality (3)

Designed to provide participants with the opportunity to study the expression of human sexuality and intimacy across the life span as well as strategies to both facilitate healthy sexual development and overcome common sexual functioning problems. Students will be assisted in the process of recognizing personal attitudes and values about various aspects of sexuality and their effect on practice as well as the process of comfortably discussing sexuality with individuals and couples. Also addresses the impact of sexual abuse and sexuality and treatment considerations. Presented in a varied format structured to include lecture/discussion, audio-visual presentations, participant self-evaluation of their own attitudes and values, role plays and small group discussion.

Coun 573 - Contemporary Couples, Marriage, and Family Systems (3)

Focus on contemporary couples, marriage and family systems as they exist in American society today. Explore the past, present, and future of these systems, including changing demographics and their implications for professionals.

Coun 574 - Family Life Cycle and Transitions (3)

Intended for graduate students taking the MFT series, this course examines family development as a foundational framework for family therapy. The developmental context provides opportunity to consider symptoms and dysfunction as related to tasks and challenges of reorganization at transition points.

Coun 575 - Foundations of Couples, Marriage, and Family Counseling (3)

This course constitutes an introduction to the theory and methodology of marriage and family counseling. Attention is given to the major family interactional patterns which lead to family system breakdowns as well as the development of skills in the identification of such patterns. Family process assessment techniques, beginning work with families, dealing with resistance in family counseling, use of “self,” doubling, sculpting, etc., are interventions which are taught using an experiential format.

Coun 576 - Parents, Families, and Communities in Schools (3)

Examines effective methods for including parents, families, and communities in schools. Emphasizes a systems perspective that includes consultation and collaboration in addressing academic, career, and personal/social success for all students. Family dynamics and influences on school success will be addressed. Application of school counseling consultation, collaboration, and family support for all students will result in a school-based project integrated into a school’s comprehensive counseling program.

Coun 577 - Family Therapy (3)

This course will provide an overview of family therapy, particularly related to parent-child relationships. Families will be understood from practical, structural, intergenerational, cultural, developmental, topical, and process perspectives. A foundation in family therapy theory is a prerequisite for this course; the emphasis here will be on application of theory and the development of family therapy skills. Experiential learning (role plays) will occur during class, with participation required from all students.

Coun 578 - Couples Therapy (3)

Students learn to conceptualize and intervene systematically with couple units. Attention is given to maintaining therapeutic balance, developing an intersystem treatment plan, and asking systemic/interactional questions. A major emphasis is supervised skill practice through role play.
Coun 579 - Advanced Systemic Interventions: Couples and Families (3)

Intended for graduate students taking the MFT series, this course analyzes current therapeutic assessment tools and interventions grounded in systemic theory/research as they pertain to family transitions. Success in this course builds upon requisite mastery of major systemic concepts that have to do with systemic function, structure, and motivation as related to assessing similarities and differences between normative and paranormative marriage and family life transitions. Appropriate systemic assessment integrates with systemic therapeutic interventions in resolving crisis resulting from family transitional difficulty, chronic illness, divorce, separation, remarriage, death.

Coun 580 - Supervision (1)

Presents a systemic model of clinical supervision and its application to the supervisory process. Relationship of the model to existing conceptual and empirical literature also overviewed. Techniques and skills for debriefing and mentoring supervisees also addressed.

Coun 581 - Multicultural Perspectives in Counseling (3)

A study of the human, ecological and societal forces influencing the provision of counseling services to culturally diverse students and other clients in educational and community settings. Current issues, problems and trends will be examined. Increased competence in individual and group counseling strategies and techniques will be emphasized, using didactic and experiential approaches.

Prerequisite: Coun 541.

Coun 582 - Research and Program Evaluation in Counseling (3)

Covers the areas of research design, basic psychometric principles and statistical procedures, test/scale construction, needs assessment, program evaluation, use of library as a research tool, and writing research reports. Specific counseling applications to community, rehabilitation, and school settings are made.

Coun 583 - Job Placement and Development (3)

Designed to provide students with a solid understanding of job placement principles, practice and knowledge needed to assist people with disabilities in securing and maintaining employment, and job development and marketing techniques required for seeking both competitive and supported employment.

Coun 585 - Diagnosis and Treatment Planning I (3)

First in a sequence of two courses introducing students to the diagnosis and treatment of psychiatric disorders as outlined in the current Diagnostic and Statistical Manual of Mental Disorders. Emphasis on diagnostic reasoning, basic map and thinking process embedded in the current Manual. Use of decision trees to arrive at accurate diagnoses. Overview of conditions covered in the Manual.

Prerequisite: Coun 541.

Coun 586 - Psychopharmacology and Mental Illness (3)

Examines important psychotropic medications and their therapeutic applications. Drug efficacy, side effects, treatment of specific disorders such as anxiety and mood disorders, psychoactive substance use disorders, and schizophrenia.

Prerequisite: Coun 541.

Coun 587 - Foundations of Mental Health Services (3)

Examines community mental health movement, policy, service sequence, and related legislation; organization and delivery of mental health services at the federal, state, and local levels; influences and trends in service delivery.

Prerequisite: Coun 541.

Coun 588 - Diagnosis and Treatment Planning II (3)

Second in a sequence of two courses that examine the diagnosis and treatment of mental disorders, as outlined in the current Diagnostic and Statistical Manual.

Coun 589 - Action Research in Counseling (1-2)

Designed to enable school counselors to conduct action research projects which align with school goals and CGCP standards and objectives. Students learn about action research methods, literature reviews, needs assessments, and guidance interventions. Students develop a research proposal, conduct the research, analyze data, and disseminate results through a formal report. Two credits in Fall term, One in Winter, Two in Spring.

Coun 590 - Foundation of Rehabilitation Counseling (3)

Introductory course for students pursuing graduate study in rehabilitation counseling and is also oriented toward students with a more peripheral interest in related human service fields. Intended to provide a broad overview of the profession of rehabilitation counseling with an emphasis on both theoretical and practical aspects of the field.

Prerequisite: Psy 534 or Coun 541.

Coun 591 - Medical Aspects of Disability (3)

Covers the most common physical, sensory, and mental disabilities encountered by the rehabilitation professional. The major symptomatology, diagnostic procedures, treatment modalities, functional implications, and psychosocial and vocational correlates of each disabling condition will be discussed.

Prerequisite: Coun 590.

Coun 592 - Psychosocial Aspects of Disability (3)

Covers the psychological and social aspects of adjustment and adaptation to a variety of disabling conditions. Theoretical and practical issues relating to various types of physical, psychiatric, mental and social disabilities will be examined and discussed.

Prerequisite: Coun 590.

Coun 593 - Case Management (3)

Students will study case management systems and skills as used in both public and private rehabilitation and related other human service agencies. Topics covered include case identification, referral, eligibility determination, assessment, goal setting, plan development, intervention strategies, case monitoring, inter-agency coordination, advocacy, promotion of self-advocacy by client, software systems, information flow, organizational structures, time management, critical case management skills, funding...
sources and billing, as well as other topics of interest to the student.

Prerequisite: Coun 590.

**Coun 594 - Occupational Analysis/Vocational Evaluation (3)**

Content and experiences presented through this course are designed to familiarize the student with the basic principles and imperatives of occupational analysis and vocational evaluation and how these are applied and used in real world settings. Didactic instruction, experiential research, and collegial participation will be used to help students integrate course teachings into a core of personal and professional understanding which can then be applied to many different settings or systems.

Prerequisite: Coun 590.

**Coun 595 - Contemporary Issues and Applications in Rehabilitation Counseling (3)**

Covers contemporary issues in the field of rehabilitation counseling as well as recent applications of rehabilitation theories, technologies, assessment procedures, and counseling modalities, to a variety of rehabilitation settings and across rehabilitation populations.

**Coun 596 - Foundations of School Counseling (3)**

Foundational course for students pursuing graduate study in the specialized field of school counseling. Intended to provide a broad overview of the school counseling profession with an emphasis on both theoretical and practical aspects of comprehensive school counseling programs. Field study required.

**Coun 597 - Strengths, Risk Factors, and Disturbance in Infants, Toddlers, and Their Families (3)**

Focus on infants, toddlers, and their families and how they cope successfully with life tasks and external stressors. Examination of what happens when coping breaks down and problems emerge in families with young children. Students will (1) identify relevant strengths and resiliency factors for infants, toddlers, and their families; (2) understand developmentally relevant risk factors, especially parental mental health issues, and their potential impact on infants, toddlers, and their families; and (3) gain knowledge of major forms of psychopathology within infant/toddler mental health.

**Coun 601 - Research (1-9)**

(Credit to be arranged.)

**Coun 602 - Independent Study (1-9)**

(Credit to be arranged.)

**Coun 603 - Dissertation (1-9)**

(Credit to be arranged.)

**Coun 604 - Cooperative Education/Internship (1-9)**

(Credit to be arranged.)

**Coun 605 - Reading and Conference (1-9)**

(Credit to be arranged.)

**Coun 606 - Special Problems/Projects (1-9)**

(Credit to be arranged.)

**Coun 607 - Seminar (1-9)**

(Credit to be arranged.)

**Coun 608 - Workshop (1-9)**

(Credit to be arranged.)

**Coun 609 - Practicum (1-9)**

(Credit to be arranged.)

**Coun 610 - Selected Topics (1-9)**

(Credit to be arranged.)

**Coun 611 - Experimental Course (0-9)**

(Credit to be arranged.)

**CR - Conflict Resolution**

**CR 301 - Introduction to Conflict Resolution (4)**

Introduces conflict resolution studies. Explores the nature of conflict and our understanding of what resolution seeks to achieve. Emphasizes strategies students currently employ toward resolving conflict in their own lives, with suggestions and examples that broaden their understanding of what is possible. Small groups, simulated conflict situations, role plays, and examples from community service provide students with the opportunity to both better understand their own strategies and develop new ones.

**CR 301U - Introduction to Conflict Resolution (4)**

Introduces conflict resolution studies. Explores the nature of conflict and our understanding of what resolution seeks to achieve. Emphasizes strategies students currently employ toward resolving conflict in their own lives, with suggestions and examples that broaden their understanding of what is possible. Small groups, simulated conflict situations, role plays, and examples from community service provide students with the opportunity to both better understand their own strategies and develop new ones.
CR 303 - Consensus Building (4)
This course explores the theories, approaches, and practical applications of consensus building. Comprehension of consensus building organizational theory is applied through a variety of strategies, approaches, activities, and consensus building processes. These strategies, approaches, activities, and processes are contextualized through case-study literature and experiential learning assignments.

CR 303U - Ecology of War and Peace (4)
Looks at environmental effects of waging and preparing to wage war, natural resource drivers to war, and what an ecology of peace would look like and what it would accomplish. Conceptually, what is a more thorough and accurate cost-benefit analysis of methods of nation-state conflict management, using the US as the case example.

CR 304 - Participating in Democracy (4)
This course is designed to explore the meaning of democracy by constructing the notion of ‘living democracy’. The importance of participating in democracy and the impediments are explored. Historical and present examples will be used to illustrate forms civic participation on the local, regional, national and international level.

CR 304U - Introduction to Nonviolence (4)
This course examines nonviolence from several perspectives, including units on philosophical and religious nonviolence, nonviolent communication, nonviolent response to personal attack, Gandhian nonviolence, Sharp strategic nonviolence, and the emergent field of nonviolent conflict forensics.

CR 305 - Conflict Management Skills (4)
Interactive survey of practical array of conflict management competencies with units on facilitation, consensus building, mediation, conflict analysis, conflict mapping, de-escalation, negotiation, conflict management system design, community organizing, conflict management careers. Theory, simulations, and student team presentations generate new competencies and evaluative opportunities.

CR 306 - Conflict Resolution Career Preparation (4)
Community based learning of variety and breadth of conflict transformation and peacebuilding through a combination of visits, field experience and project work. Development of reflective practice habits through online seminar discussion.

Prerequisite: CR 301.

CR 311 - Introduction to Intercultural Conflict Resolution (4)
Intercultural conflict resolution explored through intercultural communication theory, and through study of its relationship to processes of conflict and outcomes of resolution. Considers how intercultural conflict resolution operates within our selves, among our selves, and in the personal, professional, and world-at-large through dialogue, interaction, and the creative arts.

CR 312 - Evil and Hate (4)
Explores the breakdown in dialogue surrounding the stereotyping and dehumanization of those who we view as "evil doers." Challenges unreflective use the terms, "hatred" and "evil" in political rhetoric, creating a dangerous "us and them" dichotomy, and making reconciliation across cultures and viewpoints nearly impossible.
Also offered for graduate-level credit as CR 516 and may be taken only once for credit.

CR 419 - Forgiveness and Atonement (4)
Explores both the theoretical and practical advantages and difficulties with forgiveness and atonement. Emphasis on how forgiveness and atonement inform conflict resolution practices. Also offered for graduate-level credit as CR 519 and may be taken only once for credit.

CR 420 - Individual and Group Reconciliation Processes (4)
Explores various dimensions involved in the process of reconciliation between individuals, groups and societies. Topics covered include the evolution of historical wounds, memory, accountability, acknowledgment, restitution, forgiveness and truth. Case studies provide a focal point for class discussions and analysis. Also offered for graduate-level credit as CR 520 and may be taken only once for credit.

Prerequisite: upper-division standing and CR 301.

CR 423 - Dialogue Across Differences (4)
An exploration of the theory and practice of dialogue to address conflict. Dialogue includes intention, purpose, process dimensions and outcomes and is utilized in various dimensions of peace and conflict resolution efforts. Dialogue crosses disciplines, creating a common thread through the many dimensions of peace work. Also offered for graduate-level credit as CR 523 and may be taken only once for credit.

Prerequisite: upper-division standing.

CR 427 - Nationalism and Ethnic Conflict (4)
Interdisciplinary inquiry into leading perspectives and theories of nationalism. Examined as a determinant factor of international and interethnic conflict. Analyzed through multiple case-specific conflict phenomena. Assessed in terms of its historical roots, evolution, structural patterns and socio-political antecedents and consequences. Also offered for graduate-level credit as CR 527 and may be taken only once for credit.

Prerequisite: Upper-division standing.

CR 428 - Human Values in War and Peace: Value Dilemmas, Contradictions and Resolutions (4)
Critically reflects on how similarly or differently values and belief systems function under conditions of war and peace. Explores value conflicts and possible resolutions, as well as how different approaches to values may be conducive to violent conflict or to empowering peace on the international stage. Also offered for graduate-level credit as CR 528 and may be taken only once for credit.

Prerequisite: upper-division standing.

CR 429 - European Union as a Peacebuilding System (4)
Interdisciplinary focus on the European Union as an inter- and trans-national system of conflict resolution and peace building. Examined by contrasting the nationalist conflicts of old Europe to post-war efforts in building a system of peace and security that transcends belligerent ethnocentric nationalism. Also offered for graduate-level credit as CR 529 and may be taken only once for credit.

Prerequisite: upper-division standing.

CR 430 - Dialogue Across Differences (4)
An exploration of the theory and practice of dialogue to address conflict. Dialogue includes intention, purpose, process dimensions and outcomes and is utilized in various dimensions of peace and conflict resolution efforts. Dialogue crosses disciplines, creating a common thread through the many dimensions of peace work. Also offered for graduate-level credit as CR 530 and may be taken only once for credit.

Prerequisite: upper-division standing.

CR 439 - Family Mediation (2)
In cases of divorce and custody Oregon State Law encourages/mandates the use of mediation. Particular concerns around power balancing, domestic violence, child-focused parenting, and other family issues will be explored. Specific training and ethical standards will be evaluated in relationship to the general practice of mediation. Also offered for graduate-level credit as CR 539 and may be taken only once for credit.

Prerequisite: upper-division standing.

CR 440 - Peer Mediation (2)
Overview of programs in the schools where youth serve as mediators to resolve conflict between other students. Focus will be on successes and challenges as well as other approaches schools undertake to respond to student conflict. Opportunity to practice conflict resolution skills and analyze conflict dynamics of race and oppression. Also offered for graduate-level credit as CR 540 and may be taken only once for credit.

Prerequisite: upper-division standing.

CR 441 - Storytelling and Conflict Resolution (4)
Storytelling plays a role in limiting, creating and sustaining creative conflict resolution. Critical thinking and deliberate analysis used to deconstruct the grand narratives of dominant discourse, explore counter narratives emerging from the margins, and examine how resolution – and social change – has surfaced as a result. Also offered for graduate-level credit as CR 541 and may be taken only once for credit.

Prerequisite: upper-division standing.

CR 442 - Peace Education (4)
A theoretical and practical introduction to the field of Peace Education. Explores the philosophical, cultural, pedagogical and curricular elements of Peace Education. Develops understanding of the theory and practice of effective conflict resolution education. Also offered for graduate-level credit as CR 542 and may be taken only once for credit.

Prerequisite: upper-division standing.

CR 443 - Nationalism and Democracy in a Post-9/11 World (4)
Examines the rise of American nationalism in the aftermath of 9/11 and its impact on America’s relationship to the world. From a peace and conflict studies perspective, the narrative of American nationalism is investigated in contrast to the narrative of American democracy, examining implications for war and peace. Also offered for graduate-level credit as CR 543 and may be taken only once for credit.

Prerequisite: upper-division standing.

CR 444 - Neighbors and Enemies: Cyprus, Greece and Turkey (4)
Focuses on the protracted ethno-nationalist conflict in Cyprus and Greek-Turkish relations. The Cyprus problem is investigated as a case study in nationalist conflict in the context of domestic, regional and international conflict dynamics. Trends toward conflict de-escalation and reconciliation in the context of the EU are also studied. Also offered for graduate-level credit as CR 544 and may be taken only once for credit.

Prerequisite: upper-division standing.
CR 445 - Gender and Conflict Resolution (4)
Explores the social construction of gender and its impact on conflict. Psychological theories, violence and aggression, communication styles, culture, societal structures, conflict resolution paradigms and war and peacebuilding are analyzed. Examines micro and macro issues connected to gender, peace, conflict and violence. Also offered for graduate-level credit as CR 545 and may be taken only once for credit.
Prerequisite: upper-division standing.

CR 501 - Research (1-8)
(Credit to be arranged.)

CR 502 - Independent Study (1-6)
(Credit to be arranged.)

CR 503 - Thesis (1-12)
(Credit to be arranged.)

CR 504 - Cooperative Education/Internship (1-12)
(Credit to be arranged.)

CR 505 - Reading and Conference (1-8)
(Credit to be arranged.)

CR 506 - Special Projects (1-8)
(Credit to be arranged.)

CR 507 - Seminar (1-8)
(Credit to be arranged.)

CR 508 - Workshop (1-12)
(Credit to be arranged.)

CR 509 - Practicum (1-9)
(Credit to be arranged.)

CR 510 - Selected Topics (1-4)
(Credit to be arranged.)

CR 511 - Research Methods in Conflict Resolution (4)
Introduction to academic research, and specifically research within the interdisciplinary field of Conflict Resolution. Students will develop literacy in reading and understanding research, and will gain experience collecting and evaluating data.
Prerequisite: CR 512.

CR 512 - Perspectives in Conflict Resolution (4)
Introduction to full scope of the master's degree program. Since the program is intended to embrace both humanities and social science orientations, students need to become acquainted with the methods and terms of criticism arising from these sometimes-divergent disciplines. Students also need to become acquainted with the diverse models of conflict resolution derived from both the humanities and social sciences. A particular focus will be given to the legal and ethical aspects of these models, along with a full exploration of legalities and professional ethics in conflict resolution practice. Recommended prerequisite: 4 credits literature and 4 credits psychology or sociology.

CR 513 - Philosophy of Conflict Resolution (4)
Introduction to the insights that philosophy offers to the field of conflict resolution. The course will also explore the impact that conflict resolution practice may have on philosophical theory. Additionally, ethical issues that arise during conflict resolution work will be carefully considered.
Recommended prerequisite: 3 credits philosophy.

CR 514 - Conflict Resolution in Divergent Settings (4)
Examination of the variety of settings where conflict resolution takes place. Guest speakers share their experience and theoretical insights.
Prerequisite: CR 512, 513.

CR 515 - Negotiation (4)
Introduction to collaborative approaches to responding to conflict. A theoretical framework will be established for using negotiation and mediation in a variety of settings. Students will learn how to function as a neutral third party focusing on: conflict analysis, communication skills, maintaining a neutral role, creating a safe environment, and ensuring procedural, substantive and psychological satisfaction. Ethical issues and concerns in the field of mediation will be presented. Recommended prerequisite: 3 credits psychology or sociology.

CR 516 - Evil and Hate (4)
Explores the breakdown in dialogue surrounding the stereotyping and dehumanization of those who we view as "evil doers." Challenges unreflective use the terms, "hatred" and "evil" in political rhetoric, creating a dangerous "us and them" dichotomy, and making reconciliation across cultures and viewpoints nearly impossible. Also offered for undergraduate-level credit as CR 416 and may be taken only once for credit.

CR 517 - Nonviolence (4)
Designed to acquaint students with the theories and history of nonviolence from ancient times to the present, with some speculation as to future use. Recommended prerequisite: 3 credits of philosophy.

CR 518 - Psychology of Conflict Resolution (4)
Introduction to the psychological research and insights that illuminate conflict resolution theory and practice. A dual focus on both methods and research will be maintained throughout the curriculum. Recommended prerequisite: 3 credits psychology.

CR 519 - Forgiveness and Atonement (4)
Explores both the theoretical and practical advantages and difficulties with forgiveness and atonement. Emphasis on how forgiveness and atonement inform conflict resolution practices. Also offered for undergraduate-level credit as CR 419 and may be taken only once for credit.

CR 520 - Individual and Group Reconciliation Processes (4)
Explores various dimensions involved in the process of reconciliation between individuals, groups and societies. Topics covered include the evolution of historical wounds, memory, accountability, acknowledgment, restitution, forgiveness and truth. Case studies provide a focal point for class discussions and analysis. Also offered for undergraduate-level credit as CR 420 and may be taken only once for credit.
Prerequisite: upper-division standing and CR 301.
CR 522 - Thesis and Project Preparation Seminar (1)
Introduction to the culminating requirement of the CR graduate program distinguishes between the two options: thesis and project. Students discuss the different goals, activities, processes, and outcomes of the two options and review theses and projects written by predecessors.
Prerequisite: Admission to graduate program.

CR 523 - Dialogue Across Differences (4)
An exploration of the theory and practice of dialogue to address conflict. Dialogue includes intention, purpose, process dimensions and outcomes and is utilized in various dimensions of peace and conflict resolution efforts. Dialogue crosses disciplines, creating a common thread through the many dimensions of peace work. Also offered for undergraduate-level credit as CR 423 and may be taken only once for credit.
Prerequisite: upper-division standing.

CR 524 - Advanced Mediation (4)
Focus on the qualities of the practitioner that enhance the practice of mediation. The practice of mediation involves a particular kind of presence, that of a non-judgmental observer. To maintain such a presence while in the midst of emotions, intense interactions, hostility, and conflict requires much clarity, steadiness, and stability. Students will learn ways to achieve these qualities through the cultivation of mindfulness. Recommended prerequisites: CR 515.

CR 525 - Conflict Resolution Systems Design (4)
Acquaints the student with a systems approach to designing conflict resolution services. These services are designed for a wide variety of settings to handle conflicts effectively at the lowest cost. Students learn to diagnose and correct problems in an existing system, as well as create and implement a wholly new system.

CR 526 - Intercultural Conflict Resolution (4)
Explores the ways in which cultural similarities or difference might influence the conflict resolution process. In this context, culture is defined broadly and will be considered as it plays a part in either the actuality or perceptions of our experience. In addition, issues of power and marginality as they relate to dynamics of culture will be explored. Students explore and learn from other cultures and apply this learning in the evaluation and use of conflict resolution paradigms.

CR 527 - Nationalism and Ethnic Conflict (4)
Interdisciplinary inquiry into leading perspectives and theories of nationalism. Examined as a determinant factor of international and interethnic conflict. Analyzed through multiple case-specific conflict phenomena. Assessed in terms of its historical roots, evolution, structural patterns and socio-political antecedents and consequences. Also offered for undergraduate-level credit as CR 427 and may be taken only once for credit.

CR 528 - Human Values in War and Peace: Value Dilemmas, Contradictions and Resolutions (4)
Critically reflects on how similarly or differently values and belief systems function under conditions of war and peace. Explores values conflicts and possible resolutions, as well as how different approaches to values may be conducive to violent conflict or to empowering peace on the international stage. Also offered for undergraduate-level credit as CR 428 and may be taken only once for credit.
Prerequisite: upper-division standing.

CR 529 - European Union as a Peacebuilding System (4)
Interdisciplinary focus on the European Union as an inter- and trans-national system of conflict resolution and peace building. Examined by contrasting the nationalist conflicts of old Europe to post-war efforts in building a system of peace and security that transcends belligerent ethnocentric nationalism. Also offered for undergraduate-level credit as CR 429 and may be taken only once for credit.
Prerequisite: upper-division standing.

CR 530 - European Union as a Peacebuilding System (4)
Interdisciplinary focus on the European Union as an inter- and trans-national system of conflict resolution and peace building. Examined by contrasting the nationalist conflicts of old Europe to post-war efforts in building a system of peace and security that transcends belligerent ethnocentric nationalism. Also offered for undergraduate-level credit as CR 429 and may be taken only once for credit.
Prerequisite: upper-division standing.

CR 531 - Storytelling and Conflict Resolution (4)
Storytelling plays a role in limiting, creating and sustaining creative conflict resolution. Critical thinking and deliberate analysis used to deconstruct the grand narratives of dominant discourse, explore counter narratives emerging from the margins, and examine how resolution – and social change – has surfaced as a result. Also offered for undergraduate-level credit as CR 441 and may be taken only once for credit.
Prerequisite: upper-division standing.

CR 532 - Peace Education (4)
A theoretical and practical introduction to the field of Peace Education. Explores the philosophical, cultural, pedagogical and curricular elements of Peace Education. Develops understanding of the theory and practice of effective conflict resolution education. Also offered for undergraduate-level credit as CR 442 and may be taken only once for credit.
Prerequisite: upper-division standing.

CR 533 - Nationalism and Democracy in a Post-9/11 World (4)
Examines the rise of American nationalism in the aftermath of 9/11 and its impact on America’s relationship to the world. From a peace and conflict studies perspective, the narrative of American nationalism is investigated in contrast to the narrative of American democracy, examining implications for war and peace. Also offered for undergraduate-level credit as CR 439 and may be taken only once for credit.
Prerequisite: upper-division standing.

CR 534 - Peer Mediation (2)
Overview of programs in the schools where youth serve as mediators to resolve conflict between other students. Focus will be on successes and challenges as well as other approaches schools undertake to respond to student conflict. Opportunity to practice conflict resolution skills and analyze conflict dynamics of race and oppression. Also offered for undergraduate-level credit as CR 440 and may be taken only once for credit.
Prerequisite: upper-division standing.

CR 535 - Focus on the quality of the practitioner that enhance the practice of mediation. The practice of mediation involves a particular kind of presence, that of a non-judgmental observer. To maintain such a presence while in the midst of emotions, intense interactions, hostility, and conflict requires much clarity, steadiness, and stability. Students will learn ways to achieve these qualities through the cultivation of mindfulness. Recommended prerequisites: CR 515.

CR 536 - Conflict Resolution Systems Design (4)
Acquaints the student with a systems approach to designing conflict resolution services. These services are designed for a wide variety of settings to handle conflicts effectively at the lowest cost. Students learn to diagnose and correct problems in an existing system, as well as create and implement a wholly new system.

CR 537 - Intercultural Conflict Resolution (4)
Explores the ways in which cultural similarities or difference might influence the conflict resolution process. In this context, culture is defined broadly and will be considered as it plays a part in either the actuality or perceptions of our experience. In addition, issues of power and marginality as they relate to dynamics of culture will be explored. Students explore and learn from other cultures and apply this learning in the evaluation and use of conflict resolution paradigms.

CR 538 - Nationalism and Ethnic Conflict (4)
Interdisciplinary inquiry into leading perspectives and theories of nationalism. Examined as a determinant factor of international and interethnic conflict. Analyzed through multiple case-specific conflict phenomena. Assessed in terms of its historical roots, evolution, structural patterns and socio-political antecedents and consequences. Also offered for undergraduate-level credit as CR 427 and may be taken only once for credit.

CR 539 - Human Values in War and Peace: Value Dilemmas, Contradictions and Resolutions (4)
Critically reflects on how similarly or differently values and belief systems function under conditions of war and peace. Explores values conflicts and possible resolutions, as well as how different approaches to values may be conducive to violent conflict or to empowering peace on the international stage. Also offered for undergraduate-level credit as CR 428 and may be taken only once for credit.
Prerequisite: upper-division standing.

CR 540 - European Union as a Peacebuilding System (4)
Interdisciplinary focus on the European Union as an inter- and trans-national system of conflict resolution and peace building. Examined by contrasting the nationalist conflicts of old Europe to post-war efforts in building a system of peace and security that transcends belligerent ethnocentric nationalism. Also offered for undergraduate-level credit as CR 429 and may be taken only once for credit.
Prerequisite: upper-division standing.

CR 541 - Peace Education (4)
A theoretical and practical introduction to the field of Peace Education. Explores the philosophical, cultural, pedagogical and curricular elements of Peace Education. Develops understanding of the theory and practice of effective conflict resolution education. Also offered for undergraduate-level credit as CR 442 and may be taken only once for credit.
Prerequisite: upper-division standing.

CR 542 - Nationalism and Democracy in a Post-9/11 World (4)
Examines the rise of American nationalism in the aftermath of 9/11 and its impact on America’s relationship to the world. From a peace and conflict studies perspective, the narrative of American nationalism is investigated in contrast to the narrative of American democracy, examining implications for war and peace. Also offered for undergraduate-level credit as CR 439 and may be taken only once for credit.
Prerequisite: upper-division standing.

CR 543 - Focus on the quality of the practitioner that enhance the practice of mediation. The practice of mediation involves a particular kind of presence, that of a non-judgmental observer. To maintain such a presence while in the midst of emotions, intense interactions, hostility, and conflict requires much clarity, steadiness, and stability. Students will learn ways to achieve these qualities through the cultivation of mindfulness. Recommended prerequisites: CR 515.

CR 544 - Conflict Resolution Systems Design (4)
Acquaints the student with a systems approach to designing conflict resolution services. These services are designed for a wide variety of settings to handle conflicts effectively at the lowest cost. Students learn to diagnose and correct problems in an existing system, as well as create and implement a wholly new system.

CR 545 - Intercultural Conflict Resolution (4)
Explores the ways in which cultural similarities or difference might influence the conflict resolution process. In this context, culture is defined broadly and will be considered as it plays a part in either the actuality or perceptions of our experience. In addition, issues of power and marginality as they relate to dynamics of culture will be explored. Students explore and learn from other cultures and apply this learning in the evaluation and use of conflict resolution paradigms.

CR 546 - Nationalism and Ethnic Conflict (4)
Interdisciplinary inquiry into leading perspectives and theories of nationalism. Examined as a determinant factor of international and interethnic conflict. Analyzed through multiple case-specific conflict phenomena. Assessed in terms of its historical roots, evolution, structural patterns and socio-political antecedents and consequences. Also offered for undergraduate-level credit as CR 427 and may be taken only once for credit.

CR 547 - Human Values in War and Peace: Value Dilemmas, Contradictions and Resolutions (4)
Critically reflects on how similarly or differently values and belief systems function under conditions of war and peace. Explores values conflicts and possible resolutions, as well as how different approaches to values may be conducive to violent conflict or to empowering peace on the international stage. Also offered for undergraduate-level credit as CR 428 and may be taken only once for credit.
Prerequisite: upper-division standing.

CR 548 - European Union as a Peacebuilding System (4)
Interdisciplinary focus on the European Union as an inter- and trans-national system of conflict resolution and peace building. Examined by contrasting the nationalist conflicts of old Europe to post-war efforts in building a system of peace and security that transcends belligerent ethnocentric nationalism. Also offered for undergraduate-level credit as CR 429 and may be taken only once for credit.
Prerequisite: upper-division standing.

CR 549 - Peace Education (4)
A theoretical and practical introduction to the field of Peace Education. Explores the philosophical, cultural, pedagogical and curricular elements of Peace Education. Develops understanding of the theory and practice of effective conflict resolution education. Also offered for undergraduate-level credit as CR 442 and may be taken only once for credit.
Prerequisite: upper-division standing.

CR 550 - Nationalism and Democracy in a Post-9/11 World (4)
Examines the rise of American nationalism in the aftermath of 9/11 and its impact on America’s relationship to the world. From a peace and conflict studies perspective, the narrative of American nationalism is investigated in contrast to the narrative of American democracy, examining implications for war and peace. Also offered for undergraduate-level credit as CR 439 and may be taken only once for credit.
Prerequisite: upper-division standing.
for undergraduate-level credit as CR 443 and may be taken only once for credit.

Prerequisite: upper-division standing.

CR 544 - Neighbors and Enemies: Cyprus, Greece and Turkey (4)

Focuses on the protracted ethno-nationalist conflict in Cyprus and Greek-Turkish relations. The Cyprus problem is investigated as a case study in nationalist conflict in the context of domestic, regional and international conflict dynamics. Trends toward conflict de-escalation and reconciliation in the context of the EU are also studied. Also offered for undergraduate-level credit as CR 444 and may be taken only once for credit.

Prerequisite: upper-division standing.

CR 545 - Gender and Conflict Resolution (4)

Explores the social construction of gender and its impact on conflict. Psychological theories, violence and aggression, communication styles, culture, societal structures, conflict resolution paradigms and war and peacebuilding are analyzed. Examines micro and macro issues connected to gender, peace, conflict and violence. Also offered for undergraduate-level credit as CR 445 and may be taken only once for credit.

Prerequisite: upper-division standing.

CS 105 - Computing Fundamentals I (4)

Intended as an overview of computers and computer technology for non-CS majors, this course is often described as a computer literacy course. The primary focus is on the personal computer and personal productivity software. Hardware components of computers such as processors, memory, and input/output devices are discussed and compared. Software is the primary focus of the course. The main topics are system software (Windows, OS X, etc) and applications (such as browsers, word processors, spreadsheets, presentation graphics and database managers). The course concludes with discussions concerning legal and ethical issues surrounding computer technology, management information systems, and systems analysis. Expected preparation: high school algebra.

CS 106 - Computing Fundamentals II (4)

Introduction to programming, appropriate for non-CS majors. Introduction to the logical thought processes and problem-solving strategies used when programming. Concepts presented include problem definition and requirements gathering, generating a description of a step-by-step solution (the algorithm), writing a program, testing, and documentation. The programming language Visual Basic is used; several programming projects are completed during the term. Expected preparation: high school algebra, knowledge of Windows and the ability to use Windows Explorer.

Prerequisite: Prior programming experience equivalent to CS161. Co-requisites: concurrent enrollment in CS162L. Corequisite: CS 162L.

CS 162L - Lab for CS 162 (0)

Lab for CS 162.

Corequisite: CS 162.

CS 163 - Data Structures (4)

Data abstraction with formal specification. Elementary algorithm analysis. Basic concepts of data and its representation inside a computer. Linear, linked, and orthogonal lists; tree structures. Data structures are implemented as data abstractions using pointer based implementations. Sorting and search strategies. Data management. Three hours lecture and one 3-hour laboratory. The laboratory emphasizes practical programming skills.

Prerequisite: CS 162 with a grade of C or better. Co-requisites: concurrent enrollment in CS163L. Corequisite: CS 163L.

CS 163L - Lab for CS 163 (0)

Lab for CS 163.

Corequisite: CS 163.

CS 199 - Special Studies (0-12)

(Credit to be arranged.)
CS 202 - Programming Systems (4)

Students will become familiar with the language and operating system environment used in most upper division courses in the Computer Science major curriculum. Use of the file system, operating-system calls, and shell-level programming; low-level debugging of high-level programs. Programming exercises will include applications from data structures (e.g. B-trees) and memory management techniques.

Prerequisite: CS163. Corequisite: CS 202L.

CS 202L - Lab for CS 202 (0)

Lab for CS 202.


CS 250 - Discrete Structures I (4)


Prerequisite: CS 250.

CS 299 - Special Studies (0-4)

(Credit to be arranged.)


CS 300 - Elements of Software Engineering (4)

Practical techniques of program development for medium-scale software produced by individuals. Software development from problem specification through design, implementation, testing, and maintenance. The fundamental design techniques of step-wise refinement and data abstraction. A software project will be carried through the development cycle.

Prerequisite: CS 163, 201, 202.

CS 305 - Social, Ethical, and Legal Implications of Computing (2)

History of computing, social context of computing, professional and ethical responsibilities, risks and liabilities of safety-critical systems, intellectual property, privacy and civil liberties, social implications of the Internet, computer crime, economic issues in computing.

Prerequisite: a course in computer science at the 300 or higher level. Sophomore inquiry or a course in public speaking and a course in writing a research paper.

CS 311 - Computational Structures (4)

Introduces the foundations of computing. Regular languages and finite automata. Context free languages and pushdown automata. Turing machines and equivalent models of computation. Computability. Introduction to complexity. An appropriate programming language is used for programming experiments.

Prerequisite: CS 250, 251.

CS 313 - Artificial Intelligence and Game Design (4)

Study of the basic principles of computer game design, the most popular techniques and technologies for game implementation, focusing on the many ways in which advances in artificial intelligence influences game design.

Prerequisite: Prior computer programming experience equivalent to CS 163.

CS 321 - Languages and Compiler Design (4)


Prerequisite: CS 201, 202, 300, 311.

CS 321L - Lab for CS 321 (0)

Lab for CS 321.

CS 322 - Languages and Compiler Design (4)


Prerequisite: CS 201, 202, 300, 311.

CS 322L - Lab for CS 322. (0)

Lab for CS 322.

CS 333 - Introduction to Operating Systems (4)

Introduction to the principles of operating systems and concurrent programming. Operating system services, file systems, resource management, synchronization. The concept of a process; process cooperation and interference. Introduction to networks, and protection and security. Examples drawn from one or more modern operating systems. Programming projects, including concurrent programming.

Prerequisite: CS 201, 202.

CS 333L - Introduction to Operating Systems Lab (0)

Lab for Introduction to Operating Systems.

Corequisite: CS 333.

CS 340 - Discrete Structures for Engineers (4)

A one-term introduction to discrete structures with applications to computing problems. Topics include sets, relations, functions, counting, graphs, trees, recursion, propositional and predicate logic, proof techniques, Boolean algebra. The course may not be used as part of the degree requirements for the BS degree in Computer Science.

Prerequisite: CS 163, Math 252.

CS 345 - Cyberculture: The Internet and Popular Culture (4)

Study of the effect of computers and the internet on popular culture. Graduates of the course will become more intelligent and successful users of the Internet, understand how the internet works, be aware of the wide variety of applications that exist on the internet, and will understand the primary principles that underlie the success the Internet has had in changing popular culture. Typical topics will include history and technologies of the web, social networks, the long tail in business and culture, the power of groups, user generated content,
complex systems, virtual worlds and the power of search.

Prerequisite: Sophomore Inquiry: Popular Culture (UNST 254).

CS 345U - Cyberculture: The Internet and Popular Culture (4)

Study of the effect of computers and the internet on popular culture. Graduates of the course will become more intelligent and successful users of the Internet, understand how the internet works, be aware of the wide variety of applications that exist on the internet, and will understand the primary principles that underlie the success the Internet has had in changing popular culture. Typical topics will include history and technologies of the web, social networks, the long tail in business and culture, the power of groups, user generated content, complex systems, virtual worlds and the power of search.

Prerequisite: Sophomore Inquiry: Popular Culture (UNST 254).

CS 346 - Exploring Complexity in Science and Technology (4)

Introduction to Complex Systems, an interdisciplinary field that studies how collections of simple entities organize themselves to produce complex behavior, use information, and adapt and learn. Focuses on common principles underlying complexity in science and technology, and includes ideas from physics, biology, the social sciences, and computer science. The course may not be used as one of the upper-division CS Electives for the BS degree in Computer Science. This course is the same as SySc 346; course may be taken only once for credit.

Crosslisted as: SySc 346.

CS 346U - Exploring Complexity in Science and Technology (4)

Introduction to Complex Systems, an interdisciplinary field that studies how collections of simple entities organize themselves to produce complex behavior, use information, and adapt and learn. Focuses on common principles underlying complexity in science and technology, and includes ideas from physics, biology, the social sciences, and computer science. The course may not be used as one of the upper-division CS Electives for the BS degree in Computer Science. This course is the same as SySc 346; course may be taken only once for credit.

CS 347 - The Internet Age (4)

Examination of the Internet and its evolution over the last 30 years to become an essential part of today's society. Also examines the impact the Internet has had on society as well as potential threats to its continued success. The course may not be used as one of the upper-division CS Electives for the BS degree in Computer Science.

CS 347U - The Internet Age (4)

Examination of the Internet and its evolution over the last 30 years to become an essential part of today's society. Also examines the impact the Internet has had on society as well as potential threats to its continued success. The course may not be used as one of the upper-division CS Electives for the BS degree in Computer Science.

CS 348 - Digital Media, Technology and Society (4)

Covers, from a computing perspective, the transition of society to one that is primarily digital. Provides an understanding of digital media, its technical limitations, copyright and digital rights management, and digital media communications. The course may not be used as an upper-division CS Elective for the BS degree in Computer Science.

CS 348U - Digital Media, Technology and Society (4)

Covers, from a computing perspective, the transition of society to one that is primarily digital. Provides an understanding of digital media, its technical limitations, copyright and digital rights management, and digital media communications. The course may not be used as an upper-division CS Elective for the BS degree in Computer Science.

CS 350 - Algorithms and Complexity (4)

Techniques for the design and analysis of algorithms. Case studies of existing algorithms (sorting, searching, graph algorithms, dynamic programming, matrix multiplication, fast Fourier transform.) NP-Completeness.

Prerequisite: CS 250, 251, 311.
and delegation, concurrency control and distribution, object-oriented databases, and implementation. To illustrate these issues, programming assignments in languages such as Smalltalk, Eiffel and C++ will be given. Also offered for graduate-level credit as CS 520 and may be taken only once for credit.

Prerequisite: CS 322.

**CS 438 - Computer Architecture (4)**

Processors, memory hierarchy, and bus systems. Multi-level caches and cache coherence in MP systems. Arithmetic algorithms. RISC vs. CISC instructions, pipelining, and software pipelining. Superscalar, super pipelined, and VLIW architectures. Connection networks. Performance evaluation, simulation, and analytic models. Performance enhancement through branch prediction and out-of-order execution. Also offered for graduate-level credit as CS 538 and may be taken only once for credit.

Prerequisite: CS 322 or 333.

**CS 441 - Artificial Intelligence (4)**

Introduction to the basic concepts and techniques of artificial intelligence. Knowledge representation, problem solving, machine learning, natural language understanding, and AI search techniques. Also offered for graduate-level credit as CS 541 and may be taken only once for credit.

Prerequisite: CS 202.

**CS 442 - Advanced Artificial Intelligence: Combinatorial Games (4)**

Covers the theory and practice of finding optimal and satisfying solutions to one-player and two-player combinatorial games, including such popular games as Sokoban, Othello, checkers, chess, backgammon, bridge, and CCGs. Simple applications in decision theory and economics may also be discussed. Emphasis on implementation of state-of-the-art solution techniques. Also offered for graduate-level credit as CS 542 and may be taken only once for credit.

Prerequisite: CS 202 or experience with algorithms and data structures.

**CS 443 - Advanced Artificial Intelligence: Combinatorial Search (4)**

Explores methods for the solution of constraint satisfaction and related problems using search techniques, in the context of real-world problems such as resource-bounded scheduling, enterprise planning, classical planning, and one- and two-player games. Emphasis on coding projects, and on reading and reporting on selected literature. Also offered for graduate-level credit as CS 543 and may be taken only once for credit.

Prerequisite: CS 202 or experience with algorithms and data structures.

**CS 445 - Machine Learning (4)**

Provides a broad introduction to techniques for building computer systems that learn from experience; conceptual grounding and practical experience with several learning systems; and grounding for advanced study in statistical learning methods, and for work with adaptive technologies used in speech and image processing, robotic planning and control, diagnostic systems, complex system modeling, and iterative optimization. Students gain practical experience implementing and evaluating systems applied to pattern recognition, prediction, and optimization problems. Also offered for graduate-level credit as CS 545 and may be taken only once for credit.

Prerequisite: Mth 343, Stat 451, and CS 202.

**CS 446 - Advanced Topics in Machine Learning (4)**

Covers a number of more advanced topics in machine learning from a more mathematically oriented view. Provides preparation for successfully using machine-learning techniques for various applications. Also provides preparation for graduate-level research in machine learning and adaptive systems. Also offered for graduate-level credit as CS 546 and may be taken only once for credit.

Prerequisite: CS 445/545.

**CS 447 - Computer Graphics (4)**

This course will provide an introduction to graphics systems and applications. Basic structure of interactive graphics systems, characteristics of various hardware devices. Control of display devices, implementation of simple packages, device independence, and standard packages. Distributed architectures for graphics, hidden line and hidden surfaces algorithms, representations of curves and surfaces. Also offered for graduate-level credit as CS 547 and may be taken only once for credit.

Prerequisite: CS 202, Mth 261.

**CS 451 - Numerical Computation (4)**

Introduction to numerical methods. Includes topics from elementary discussion of errors, polynomials, interpolation, quadrature, linear systems of equations, and solution of nonlinear equations. Also offered for graduate-credit as CS 551 and may be taken only once for credit.

Prerequisite: Mth 261; CS 201.

**CS 452 - Building Software Systems with Components (4)**

Designed to familiarize students with the concepts behind and opportunities afforded by modern component architectures, such as Microsoft COM, Java Beans, and CORBA. Students are exposed to component development techniques and methods for developing complex software architectures using components. Students become familiar with component development, scripting and composing components, and the strengths and weaknesses of using components in designing large complex software systems. Also offered for graduate-level credit as CS 552 and may be taken only once for credit.

Prerequisite: CS 300, CS 333, CS 350; knowledge of C++ or Java programming.

**CS 454 - Software Engineering (4)**

Current methodologies for the development of large, industrial strength software systems. Topics include requirements, specification, design, implementation, testing, project management and cost estimation, formal methods, and software process improvement. Also offered for graduate-level credit as CS 554 and may be taken only once for credit.

Prerequisite: CS 321.

**CS 457 - Functional Languages (4)**

Functional notation, recursion, higher-order functions, reasoning about functions, and models for the evaluation of applicative expressions. Use of functional languages. Also offered for graduate-level credit as CS 557 and may be taken only once for credit.

Prerequisite: CS 202, CS 311.
CS 461 - Open Source Software Development Laboratory (4)
Explores Open Source software engineering and its methodologies in a laboratory classroom setting. Focuses on the development and delivery of Open Source software projects by teams of 1-3 students. Students prepare and present material, working using email and the web. Also offered for graduate-level credit as CS 561 and may be taken only once for credit.
Prerequisite: CS 300.

CS 462 - Advanced Open Source Software Engineering (4)
Surveys the growing academic literature describing tools, techniques, community management, project management and collaboration strategies used in open source software development. Emphasis is placed upon tool-driven development, upon open development processes and tools, and upon comparison with processes and practices in proprietary software. Also offered for graduate-level credit as CS 562 and may be taken only once for credit.
Prerequisite: CS 300.

CS 465 - Server-side Applications: Construction and Analysis (4)
Covers the basics of writing both CGI-Bin and client-side scripts for the World Wide Web. Topics include the Client-server Model used by the World Wide Web; server-side programming; client-side programming; security and accessibility concerns; HTTP protocols; and human-interface issues on the World Wide Web. Also offered for graduate-level credit as CS 565 and may be taken only once for credit. Expected preparation: programming ability equivalent to CS161 as well as familiarity using UNIX or Linux, and some familiarity with creating simple HTML files. The course may not be used as part of the departmental degree requirements for either the BS or the MS degrees in Computer Science.

CS 467 - The Wireless Web (4)
Covers the basics of the Wireless Application Protocol (WAP) as used in modern mobile phones and other handheld devices. Provides an overview of the WAP architecture, as well as an in-depth exploration of the WAP Application Layer (WAE), including WML, WMLScript, and the WAP push framework.
Prerequisite: CS 465/565.

CS 469 - Software Engineering Capstone (3)
Emphasizes teamwork in small groups on a substantial project that will be performed for a real customer. Projects are chosen so as to provide interdisciplinary content with project proposals being solicited from the community at large. Projects that involve students as well as customers from other disciplines are encouraged. Lectures will be directed toward the management of software development projects such as those being carried out by the teams. It is the intent of the course to provide a capstone experience that integrates the materials contained in the remainder of the CS curriculum through work on a project that applies this material in another discipline. Each team member will contribute to the design, documentation, and testing phases of the project. This course creates an obligation for participation for two consecutive quarters. This is the first course in a sequence of two: CS 469 and CS 470 which must be taken in sequence.
Prerequisite: senior standing. For CS majors: CS 201, 202, 250, 251, 300, 311, 321, 333, 350. Non-CS majors: permission of the instructor.

CS 480 - Randomized Algorithms and Probabilistic Analysis (4)
Probabilistic tools used in the design and analysis of modern algorithms and data structures. Topics include: review discrete random, occupancy problems, tail bounds, Markov chains, the probabilistic method, martingales, Monte Carlo methods. The course explores a variety of CS applications. Also offered for graduate-level credit as CS 580 and may be taken only once for credit.
Prerequisite: CS 350, Stats 451.

CS 485 - Cryptography (4)
The goal of cryptography is the encoding of information via a cryptographic system. Cryptanalysis studies the breaking of cryptosystems. This course focuses on cryptography but with respect to cryptanalysis. An overview of classical systems with an in-depth examination of modern cryptosystems. This includes block algorithms such as DES; public-key cryptosystems, such as RSA; and one-way functions. Additional topics include cryptographic protocols, signature schemes, pseudo-random number generation, Shannon’s information theory, and stream ciphers. Also offered for graduate-level credit as CS 585 and may be taken only once for credit.
Prerequisite: CS 350.

CS 486 - Introduction to Database Management Systems (4)
Introduction to fundamental concepts of database management systems using primarily the relational model. Schema design and refinement. Query languages. Database application development environments. Overview of physical data organization, query optimization and processing, physical design, security, and transactions used in recovery and concurrency control. Also offered for graduate-level credit as CS 586 and may be taken only once for credit.
Prerequisite: CS 161, 250. Expected preparation: CS 251.
CS 493 - Digital Forensics (4)

Detailed, hands-on approach to the investigation of criminal incidents in which computers or computer technology play a significant or interesting role. Familiarization with the core computer science theory and practical skills necessary to perform rudimentary computer forensic investigations, understanding the role of technology in investigating computer-based crime, and preparation to deal with investigative bodies. Also offered for graduate-level credit as CS 593 and may be taken only once for credit. Recommended: CS 333 or CS 533. No prior background in criminal justice or law is assumed.

CS 494 - Internetworking Protocols (4)

Advanced study of the protocols and algorithms used in the Internet (IETF) family of networking protocols. For example, ARP, IP, UDP, TCP, multicasting, routing protocols like RIP and OSPF, and application protocols like DNS, NFS, SNMP, FTP and HTTP. Issues such as addressing, name service, protocol design, and scalability will be explored. Also offered for graduate-level credit as CS 594 and may be taken only once for credit.

Prerequisite: CS 333.

CS 497 - Sensor Networks (4)

Foundations of sensor networks, with a focus on activity-based learning through a sequence of hands-on programming exercises with embedded devices with a high-level programming language. Basic building blocks in designing and deploying a sensor network application. Positioning and time synchronization of networked sensor devices, wireless communication characteristics of low-powered radios, energy conservation and harvesting, macro-programming a network of sensor devices and security. Also offered for graduate-level credit as CS 597 and may be taken only once for credit. Recommended prerequisites: Familiarity with computer systems concepts that could be satisfied by CS 200, CS 201. Familiarity with programming in C, C++ or Java. Familiarity with basic concepts in probability and linear algebra that could be satisfied by Mth 301 or equivalent.

Prerequisite: CS 333, CS 350, C and Java programming.

CS 498 - Introduction to Wireless Network Protocols (4)

Classification of wireless networking systems; study of multiple access protocols in single hop and multi-hop networks; performance analysis of protocols; overview of emerging radio technologies for high-throughput next generation systems; study of wireless communication protocol standards for cellular systems; case studies of deployed systems. Also offered for graduate-level credit as CS 598 and may be taken only once for credit.

Prerequisite: CS 250 or ECE 271.

CS 501 - Research (1-9)

(Credit to be arranged.) Consent of instructor.

CS 502 - Independent Study (1-9)

(Credit to be arranged.) Consent of instructor.

CS 503 - Thesis (1-9)

(Credit to be arranged.) Consent of instructor.

CS 504 - Cooperative Education/Internship (1-9)

(Credit to be arranged.) Consent of instructor.

CS 505 - Reading and Conference (1-12)

(Credit to be arranged.) Consent of instructor.

CS 506 - Special Projects (1-9)

(Credit to be arranged.) Consent of instructor.

CS 507 - Seminar (1-6)

(Credit to be arranged.) Consent of instructor.

CS 509 - Practicum (1-9)

(Credit to be arranged.) Consent of instructor.

CS 510 - Selected Topics (1-6)

(Credit to be arranged.) Consent of instructor.

CS 515 - Parallel Programming (3)

An introduction to parallel programming concepts and techniques. Topics include: parallel programming models and languages, share-memory programming, message-passing programming, performance models and analysis techniques, domain-specific parallel algorithms. Also offered for undergraduate-level credit as CS 415 and may be taken only once for credit.

Prerequisite: CS 321 and CS 333.

CS 520 - Object-Oriented Programming (3)

The fundamental concepts of object-oriented programming languages, including data abstraction and typing, class inheritance and generic types, prototypes and delegation, concurrency control and
distribution, object-oriented databases, and implementation. To illustrate these issues, programming assignments in languages such as Smalltalk, Eiffel and C++ will be given. Also offered for undergraduate-level credit as CS 420 and may be taken only once for credit.

Prerequisite: CS 322.

CS 533 - Concepts of Operating Systems (3)

Survey of concepts and techniques used in modern operating systems. Sample concepts covered are concurrency, IPCs, scheduling, resource allocation, memory management, file systems, and security. Techniques for implementing operating systems taught through a programming project.

Prerequisite: CS 333.

CS 538 - Computer Architecture (3)

Processors, memory hierarchy, and bus systems. Multi-level caches and cache coherence in MP systems. Arithmetic algorithms. RISC vs. CISC instructions, pipelining, and software pipelining. Superscalar, super pipelined, and VLIW architectures. Connection networks. Performance evaluation, simulation, and analytic models. Performance enhancement through branch prediction and out-of-order execution. Also offered for undergraduate-level credit as CS 438 and may be taken only once for credit.

Prerequisite: CS 322 or 333.

CS 541 - Artificial Intelligence (3)

Introduction to the basic concepts and techniques of artificial intelligence. Knowledge representation, problem solving, machine learning, natural language understanding, and AI search techniques. Also offered for undergraduate-level credit as CS 441 and may be taken only once for credit.

Prerequisite: CS 202.

CS 542 - Advanced Artificial Intelligence: Combinatorial Games (3)

Covers the theory and practice of finding optimal and satisfying solutions to one-player and two-player combinatorial games, including such popular games as Sokoban, Othello, checkers, chess, backgammon, bridge, and CCGs. Simple applications in decision theory and economics may also be discussed. Emphasis on implementation of state-of-the-art solution techniques. Also offered for undergraduate-level credit as CS 442 and may be taken only once for credit.

Prerequisite: CS 202 or experience with algorithms and data structures.

CS 543 - Advanced Artificial Intelligence: Combinatorial Search (3)

Explores methods for the solution of constraint satisfaction and related problems using search techniques, in the context of real-world problems such as resource-bounded scheduling, enterprise planning, classical planning, and one- and two-player games. Emphasis on coding projects, and on reading and reporting on selected literature. Also offered for undergraduate-level credit as CS 443 and may be taken only once for credit.

Prerequisite: CS 202 or experience with algorithms and data structures.

CS 545 - Machine Learning (3)

Provides a broad introduction to techniques for building computer systems that learn from experience: conceptual grounding and practical experience with several learning systems; and grounding for advanced study in statistical learning methods, and for work with adaptive technologies used in speech and image processing, robotic planning and control, diagnostic systems, complex system modeling, and iterative optimization. Students gain practical experience implementing and evaluating systems applied to pattern recognition, prediction, and optimization problems. Also offered for undergraduate-level credit as CS 445 and may be taken only once for credit.

Prerequisite: Mth 343, Stat 451, and CS 202.

CS 546 - Advanced Topics in Machine Learning (3)

Covers a number of more advanced topics in machine learning from a more mathematically oriented view. Provides preparation for successfully using machine-learning techniques for various applications. Also provides preparation for graduate-level research in machine learning and adaptive systems. Also offered for undergraduate-level credit as CS 446 and may be taken only once for credit.

Prerequisite: CS 445/545.

CS 547 - Computer Graphics (3)

This course will provide an introduction to graphics systems and applications. Basic structure of interactive graphics systems, characteristics of various hardware devices. Control of display devices, implementation of simple packages, device independence, and standard packages. Distributed architectures for graphics, hidden line and hidden surfaces algorithms, representations of curves and surfaces. Also offered for undergraduate-level credit as CS 447 and may be taken only once for credit.

Prerequisite: CS 202, Mth 261.

CS 549 - Computational Geometry (3)

Perspective and projective geometry. Analytic projective geometry, projective lines and projective planes. Projective transformations of lines and planes. Homogeneous coordinates. Applications to two-dimensional computer graphics. Conic sections in design.

Prerequisite: CS 163 and 451.

CS 550 - Parallel Algorithms (3)

Definition and nature of parallel computation. Parallel computation from the point of view of hardware/architecture, program/scheduling, and algorithms. Why and how parallel computation is different from serial computation. Examples to highlight the differences. Parallel algorithms in general: illustration of the most important features and techniques. Illustration of the limitations. A survey of major results, general form of results, limitations on speed-up.

Prerequisite: CS 350.

CS 551 - Numerical Computation (3)

Introduction to numerical methods. Includes topics from elementary discussion of errors, polynomials, interpolation, quadrature, linear systems of equations, and solution of nonlinear equations. Also offered for undergraduate-credit as CS 451 and may be taken only once for credit.

Prerequisite: Mth 261; CS 200.

CS 552 - Building Software Systems with Components (3)

Designed to familiarize students with the concepts behind and opportunities afforded by modern component architectures, such as Smalltalk, Eiffel and C++ will be given. Also offered for undergraduate-level credit as CS 452 and may be taken only once for credit.

Prerequisite: CS 322.
as Microsoft COM, Java Beans, and CORBA. Students are exposed to component development techniques and methods for developing complex software architectures using components. Students become familiar with component development, scripting and composing components, and the strengths and weaknesses of using components in designing large complex software systems. Also offered for undergraduate-level credit as CS 452 and may be taken only once for credit.

Prerequisite: CS 300, CS 333, CS 350; knowledge of C++ or Java programming.

CS 553 - Design Patterns (3)
Software design patterns are reusable solutions to recurring software problems. They capture successful experiences and convey expert insight and knowledge to less experienced developers. Course provides an in-depth view of patterns using Java as the presentation language. Course is suitable to software architects and developers who are already well-versed in this language. In addition, it offers continuous opportunities for learning the most advanced features of the Java language and understanding some principles behind the design of its fundamental libraries. Also offered as CS 653 and may be taken only once for credit.

Prerequisite: programming in Java and CS 520.

CS 554 - Software Engineering (3)
Current methodologies for the development of large, industrial strength software systems. Topics include requirements, specification, design, implementation, testing, project management and cost estimation, formal methods, and software process improvement. Also offered for undergraduate-level credit as CS 454 and may be taken only once for credit.

Prerequisite: CS 321.

CS 555 - Software Specification and Verification (3)
Theoretical and practical aspects of the software development process or software lifecycle. Covers the first part of the cycle: formulating the external requirements, specifying what the software is to do, and the abstract design. Emphasis will be on the formal aspects of specification and verification. Also offered as CS 655 and may be taken only once for credit.

CS 556 - Software Implementation and Testing (3)
Theoretical and practical aspects of the software development process or software lifecycle. Covers the second part of the cycle: detailed design, implementation in a programming language, testing, and maintenance. Emphasis will be on the technical aspects of software testing. Also offered as CS 656 and may be taken only once for credit.

CS 557 - Functional Languages (3)
Introduction to functional notation, recursion, higher-order functions, reasoning about functions, and models for the evaluation of applicative expressions. Use of functional languages. Also offered for undergraduate-level credit as CS 457 and may be taken only once for credit.

Prerequisite: CS 202, CS 311.

CS 558 - Programming Languages (3)
In-depth study of current and historical issues in the design, implementation, and application of programming languages. Topics range from basic to advanced. Areas include syntax, semantics, scoping, typing, abstraction, exceptions, and concurrency. Computational paradigms such as functional, logic, and/or object oriented are analyzed. Several "recent" programming languages used. Also offered as CS 658 and may be taken only once for credit.

Prerequisite: CS 322.

CS 559 - Software Measurement and Models (3)
Survey, evaluation, and application of software measurement techniques and models. Particular emphasis on product metrics such as Software Science, Cyclomatic Complexity, and Function Points.

CS 560 - Human-Computer Interaction (3)
Introduction to the basic theory of human-computer interaction. Principles of human cognition and interface design, interface evaluation techniques. Several prototyping tools will be presented. A project is required.

Prerequisite: Stat 460, CS 202.

CS 561 - Open Source Software Development Laboratory (3)
Explores Open Source software engineering and its methodologies in a laboratory classroom setting. Focuses on the development and delivery of Open Source software projects by teams of 1-3 students. Students prepare and present material, working using email and the web. Also offered for undergraduate-level credit as CS 461 and may be taken only once for credit.

Prerequisite: CS 300.

CS 562 - Advanced Open Source Software Engineering (3)
Surveys the growing academic literature describing tools, techniques, community management, project management and collaboration strategies used in open source software development. Emphasis is placed upon tool-driven development, upon open development processes and tools, and upon comparison with processes and practices in proprietary software. Also offered for undergraduate-level credit as CS 462 and may be taken only once for credit.

Prerequisite: CS 300.

CS 565 - Server-side Applications: Construction and Analysis (3)
Covers the basics of writing both CGI-Bin and client-side scripts for the World Wide Web. Topics include the Client-server Model used by the World Wide Web; server-side programming; client-side programming; security and accessibility concerns; HTTP protocols; and human-interface issues on the World Wide Web. Also offered for undergraduate-level credit as CS 465 and may be taken only once for credit. Expected preparation: programming ability equivalent to CS161 as well as familiarity using UNIX or Linux, and some familiarity with creating simple HTML files. The course may not be used as part of the departmental degree requirements for either the BS or the MS degrees in Computer Science.

CS 567 - The Wireless Web (3)
Covers the basics of the Wireless Application Protocol (WAP) as used in modern mobile phones and other handheld devices. Provides an overview of the WAP architecture, as well as an in-depth exploration of the WAP Application Layer.
Prerequisite: CS 465/565.

CS 568 - Functional Logic Programming (3)
Introduction to functional logic programming. Foundations and basic principles of this paradigm will be explained in some depth and complemented by encoding practical problems in a functional logic language using a leading compiler/interpreter. Focus on non-determinism and computations with incomplete information. Implementation techniques will be briefly discussed. Also offered as CS 668 and may be taken only once for credit.
Prerequisite: CS 558 Programming Languages.

CS 569 - Scholarship Skills for Computer Science and Engineering (3)
The purpose of this course is to make participants better scholars in Computer Science. In particular it attempts to help students become better researchers, better writers, better presenters, and better reviewers. It concentrates on reading, writing and composition skills: on the production and consumption of the "media" used by computer scientists to communicate professionally. At the completion of the course, students should be familiar with the tasks and activities of modern scholars in computer science. Also offered as CS 669 and may be taken only once for credit.
Prerequisite: admission into a Ph.D. program within MCECS.

CS 572 - Operating System Internals (3)
Internals of a specific operating system including structure of the kernel, block buffering cache, file system structure and system calls, process structure and scheduling, memory management, device driver interface, and inter process communication. Also offered as CS 672 and may be taken only once for credit.
Prerequisite: CS 333.

CS 575 - Computer Systems Analysis (3)
An advanced course on computer systems. Topics include operating systems, performance evaluation, device analysis, construction and proof of monitors, file systems, objects and processes, reliability, and protection.
Prerequisite: CS 321, 333.

CS 576 - Computer Security (3)
Introduction to the principles of computer security. Development of the notion of security through formal models and the examination of existing secure systems. Systems intended for the protection of classified information as well as commercial systems will be examined. Also offered as CS 676 and may be taken only once for credit.
Prerequisite: CS 333.

CS 577 - Modern Language Processors (3)
An advanced course on compiler construction for modern programming languages, such as object-oriented or functional languages. Topics include type-checking, executable intermediate representations, interpretation and virtual machines, code generation for modern architectures, memory management and garbage collection, and optimization. Also offered as CS 677 and may be taken only once for credit.
Prerequisite: CS 322.

CS 578 - Programming Language Semantics (3)
Introduction to the formal mathematical study of program meaning (semantics), using one or more approaches such as operational semantics, denotational semantics, or programming logics. Emphasis on rigorous mathematical development and formal proof techniques. Language features to be studied may include types and type safety, purity and imperative effects, functional and modular abstraction, polymorphism, higher-order functions, and object-oriented features. Also offered as CS 678 and may be taken only once for credit. Expected preparation: CS 558 and/or CS 557.

CS 579 - Formal Verification of Hardware/Software Systems (3)
Introduction to the formal verification of functional correctness of hardware and software systems. Topics to be covered include: formal logics for system verification (first-order logic, higher order logic, temporal logic), formal specifications, theorem proving systems, circuit verification, microprocessor verification, and system software verification.
Prerequisite: CS 321, 333.

CS 580 - Randomized Algorithms and Probabilistic Analysis (3)
Probabilistic tools used in the design and analysis of modern algorithms and data structures. Topics include: review discrete random, occupancy problems, tail bounds, Markov chains, the probabilistic method, martingales, Monte Carlo methods. The course explores a variety of CS applications. Also offered for undergraduate-level credit as CS 480 and may be taken only once for credit.
Prerequisite: CS 350, Stats 451.

CS 581 - Theory of Computation (3)
Computability theory: study of models of computation (Turing, Church, Kleene), recursive function theory, properties of recursive, and recursively innumerable sets.
Prerequisite: CS 311.

CS 582 - Theory of Computation: Advanced Topics (3)
Complexity theory: study of resource bounded computation, the complexity classes (P, NP, PSPACE, and PH), NP-completeness, relativized computation, randomized classes.
Prerequisite: CS 311, 350.

CS 583 - Automata and Formal Languages (3)
An advanced study of the theory of automata, formal languages and computational complexity. Main subjects are finite state concepts, formal grammars, computability, Turing machines, and computational complexity.
Prerequisite: CS 582/682.

CS 584 - Algorithm Design and Analysis (3)
An advanced in-depth study in the design and analysis of algorithms. Topics include models of computation, sorting, data structures, graph algorithms, matrix multiplication, fast Fourier transform, polynomial arithmetic, pattern matching, and NP-complete problems. Also offered as CS 684 and may be taken only once for credit.
Prerequisite: CS 350 or equivalent.

CS 585 - Cryptography (3)
The goal of cryptography is the encoding of information via a cryptographic system.
Cryptanalysis studies the breaking of cryptosystems. This course focuses on cryptography but with respect to cryptanalysis. An overview of classical systems with an in-depth examination of modern cryptosystems. This includes block algorithms such as DES; public-key cryptosystems, such as RSA; and one-way functions. Additional topics include cryptographic protocols, signature schemes, pseudo-random number generation, Shannon's information theory, and stream ciphers. Also offered for undergraduate-level credit as CS 485 and may be taken only once for credit.

Prerequisite: CS 350.

**CS 586 - Introduction to Database Management Systems (3)**

Introduction to fundamental concepts of database management systems using primarily the relational model. Schema design and refinement. Query languages. Database application development environments. Overview of physical data organization, query optimization and processing, physical design, security, and transactions used in recovery and concurrency control. Also offered for undergraduate-level credit as CS 486 and may be taken only once for credit.

Prerequisite: CS 161, 250. Expected preparation: CS 251.

**CS 587 - Database Management Systems Implementation (3)**

Internal design of a relational database management system. Concurrency control; lock managers; crash recovery; query and operator evaluation; query optimization; storage management; index structures; system catalogs. Also offered for undergraduate-level credit as CS 487 and may be taken only once for credit.

Prerequisite: CS 486/586 and CS 333.

**CS 588 - Distributed Database Systems (3)**

Theory and design of distributed database systems. Concurrency control and recovery, distributed deadlock detection, replication, query processing and optimization, parallel database machines, multimedia servers, and heterogeneous multi-database systems.

Prerequisite: CS 487/587.

**CS 589 - Principles of Database Systems (3)**

This course explores the foundations of database systems, with a focus on data models and query languages. It will show how formal methods are applied to issues in database design and processing. Topics may include query formalisms and their equivalence, query transformation, semi-structured data models, dependencies and normal forms, logic and deductive databases, data language complexity, treatment of incomplete information, complex-value models, semantic models and classification, and temporal databases. Also offered as CS 689 and may be taken only once for credit. Recommended prerequisites: CS 486 or CS 586 or equivalent course; familiarity with discrete math and logic that could be satisfied by CS 250/CS 251 or by Mth 356.

**CS 591 - Introduction to Computer Security (3)**

Provides a broad overview of computer security. Provides a solid theoretical foundation, as well as real-world examples, for understanding computer security. Fundamental theoretical results, foundational models, and salient examples will be covered. Security in computer operating systems, networks, and data will be covered, with emphasis on operating system and program security. Also offered for undergraduate-level credit as CS 491 and may be taken only once for credit.

Prerequisite: CS 333, CS 350, C and Java programming.

**CS 592 - Malware (3)**

This course will study the motivations of malicious code developers and the common weaknesses their code has exploited. In addition, the course explores the form and function of a range of malware while exploring how the increased mixing of code and data is now exposing us to an array of security vulnerabilities and exploits. Given these threats, the course will then examine modern defenses against malware and how they can be used to protect users. Also offered for undergraduate-level credit as CS 492 and may be taken only once for credit.

Prerequisite: junior-standing and admission into the CS program.

**CS 593 - Digital Forensics (3)**

Detailed, hands-on approach to the investigation of criminal incidents in which computers or computer technology play a significant or interesting role. Familiarization with the core computer science theory and practical skills necessary to perform rudimentary computer forensic investigations, understanding the role of technology in investigating computer-based crime, and preparation to deal with investigative bodies. Also offered for undergraduate-level credit as CS 493 and may be taken only once for credit. Recommended: CS 333 or CS 533. No prior background in criminal justice or law is assumed.

**CS 594 - Internetworking Protocols (3)**

Advanced study of the protocols and algorithms used in the Internet (IETF) family of networking protocols. For example, ARP, IP, UDP, TCP, multicasting, routing protocols like RIP and OSPF, and application protocols like DNS, NFS, SNMP, FTP and HTTP. Issues such as addressing, name service, protocol design, and scalability will be explored. Also offered for undergraduate-level credit as CS 494 and may be taken only once for credit.

**CS 595 - Network Routing (3)**

Class will study modern packet-based routing protocols as used in the Internet including interior gateway protocols (IGPs) like RIPv1, RIPv2, OSPF, and exterior gateway protocols (EGPs) like BGP. Certain routing control theory topics will be introduced; for example, link-state and vector distance routing, policy routing, source routing and tunnels, and the general use of metrics in existing routing protocols. Other aspects of routing protocols may be presented as time permits; for example, multicast routing, mobile routing, and tag-switching protocols. This class may take the form of a seminar with students asked to present various aspects of recent experimental research in routing. Also offered as CS 695 and may be taken only once for credit.

Prerequisite: CS 594.

**CS 596 - Network Management and Security (3)**

Covers both network management and network security. Network management will
include the design of LAN-based networks, including spanning tree protocols, bridge learning protocols, virtual LANs, and Ethernet switches, and the security of switches and routers. Network management protocols will be covered in-depth including switch and router management information bases, as well as associated SNMP protocols, and network monitoring tools. The second half of the class will focus on network security. In order to understand the network security problem, the security section will begin with a review of various forms of network attacks. We then turn to network-side security management including both passive measures like firewall defense schemes including packet filters, and bastion hosts. Newer secure protocols will then be covered including network-layer security and various application-layer secure protocols. Also offered as CS 696 and may be taken only once for credit.

Prerequisite: CS 594.

**CS 597 - Sensor Networks (3)**

Foundations of sensor networks, with a focus on activity-based learning through a sequence of hands-on programming exercises with embedded devices with a high-level programming language. Basic building blocks in designing and deploying a sensor network application. Positioning and time synchronization of networked sensor devices, wireless communication characteristics of low-powered radios, energy conservation and harvesting, macro-programming a network of sensor devices, and security. Also offered for undergraduate-level credit as CS 497 and may be taken only once for credit.

Recommended prerequisites: Familiarity with computer systems concepts that could be satisfied by CS 200, CS 201. Familiarity with programming in C, C++ or Java. Familiarity with basic concepts in probability and linear algebra that could be satisfied by Mth 301 or equivalent.

**CS 598 - Introduction to Wireless Network Protocols (3)**

Classification of wireless networking systems; study of multiple access protocols in single hop and multi-hop networks; performance analysis of protocols; overview of emerging radio technologies for high-throughput next generation systems; study of wireless communication protocol standards for cellular systems; case studies of deployed systems. Also offered for undergraduate-level credit as CS 498 and may be taken only once for credit.

Prerequisite: CS 250 or ECE 271.

**CS 601 - Research (1-12)**

(Credit to be arranged.) Consent of instructor.

**CS 603 - Dissertation (1-12)**

(Credit to be arranged.) Consent of instructor.

**CS 604 - Cooperative Education/Internship (1-8)**

(Credit to be arranged.) Consent of instructor.

**CS 605 - Reading and Conference (1-8)**

(Credit to be arranged.) Consent of instructor.

**CS 606 - Special Projects (1-12)**

(Credit to be arranged.) Consent of instructor.

**CS 607 - Seminar (1-4)**

(Credit to be arranged.)

**CS 610 - Selected Topics (1-8)**

(Credit to be arranged.) Consent of instructor.

**CS 653 - Design Patterns (3)**

Software design patterns are reusable solutions to recurring software problems. They capture successful experiences and convey expert insight and knowledge to less experienced developers. Course provides an in-depth view of patterns using Java as the presentation language. Course is suitable to software architects and developers who are already well-versed in this language. In addition, it offers continuous opportunities for learning the most advanced features of the Java language and understanding some principles behind the design of its fundamental libraries. Also offered as CS 553 and may be taken only once for credit.

Prerequisite: programming in Java and CS 520.

**CS 655 - Software Specification and Verification (3)**

Theoretical and practical aspects of the software development process or software lifecycle. Covers the first part of the cycle: formulating the external requirements, specifying what the software is to do, and the abstract design. Emphasis will be on the formal aspects of specification and verification. Also offered as CS 555 and may be taken only once for credit.

**CS 656 - Software Implementation and Testing (3)**

Theoretical and practical aspects of the software development process or software lifecycle. Covers the second part of the cycle: detailed design, implementation in a programming language, testing, and maintenance. Emphasis will be on the technical aspects of software testing. Also offered as CS 556 and may be taken only once for credit.

**CS 658 - Programming Languages (3)**

In-depth study of current and historical issues in the design, implementation, and application of programming languages. Topics range from basic to advanced. Areas include syntax, semantics, scoping, typing, abstraction, exceptions, and concurrency. Computational paradigms such as functional, logic, and/or object oriented are analyzed. Several "recent" programming languages used. Also offered as CS 558 and may be taken only once for credit.

**CS 659 - Software Measurement and Models (3)**

Survey, evaluation, and application of software measurement techniques and models. Particular emphasis on product metrics such as Software Science, Cyclomatic Complexity, and Function Points.

**CS 668 - Functional Logic Programming (3)**

Introduction to functional logic programming. Foundations and basic principles of this paradigm will be explained in some depth and complemented by encoding practical problems in a functional logic language using a leading compiler/interpreter. Focus on non-determinism and computations with incomplete information. Implementation techniques will be briefly discussed. Also offered as CS 568 and may be taken only once for credit.

Prerequisite: CS 558 Programming Languages.
CS 669 - Scholarship Skills for Computer Science and Engineering (3)
The purpose of this course is to make participants better scholars in Computer Science. In particular it attempts to help students become better researchers, better writers, better presenters, and better reviewers. It concentrates on reading, writing and composition skills: on the production and consumption of the "media" used by computer scientists to communicate professionally. At the completion of the course, students should be familiar with the tasks and activities of modern scholars in computer science. Also offered as CS 569 and may be taken only once for credit.
Prerequisite: admission into a Ph.D. program within MCECS.

CS 672 - Operating System Internals (3)
Internals of a specific operating system including structure of the kernel, block buffering cache, file system structure and system calls, process structure and scheduling, memory management, device driver interface, and inter process communication. Also offered as CS 572 and may be taken only once for credit.
Prerequisite: CS 333.

CS 676 - Computer Security (3)
Introduction to the principles of computer security. Development of the notion of security through formal models and the examination of existing secure systems. Systems intended for the protection of classified information as well as commercial systems will be examined. Also offered as CS 569 and may be taken only once for credit.
Prerequisite: CS 333.

CS 677 - Modern Language Processors (3)
An advanced course on compiler construction for modern programming languages, such as object-oriented or functional languages. Topics include type-checking, executable intermediate representations, interpretation and virtual machines, code generation for modern architectures, memory management and garbage collection, and optimization. Also offered as CS 577 and may be taken only once for credit.
Prerequisite: CS 322.

CS 678 - Programming Language Semantics (3)
Introduction to the formal mathematical study of program meaning (semantics), using one or more approaches such as operational semantics, denotational semantics, or programming logics. Emphasis on rigorous mathematical development and formal proof techniques. Language features to be studied may include types and type safety, purity and imperative effects, functional and modular abstraction, polymorphism, higher-order functions, and object-oriented features. Also offered as CS 578 and may be taken only once for credit. Expected preparation: CS 558 and/or CS 557.

CS 684 - Algorithm Design and Analysis (3)
An advanced in-depth study in the design and analysis of algorithms. Topics include models of computation, sorting, data structures, graph algorithms, matrix multiplication, fast Fourier transform, polynomial arithmetic, pattern matching, and NP-complete problems. Also offered as CS 584 and may be taken only once for credit.
Prerequisite: CS 350 or equivalent.

CS 689 - Principles of Database Systems (3)
This course explores the foundations of database systems, with a focus on data models and query languages. It will show how formal methods are applied to issues in database design and processing. Topics may include query formalisms and their equivalence, query transformation, semi-structured data models, dependencies and normal forms, logic and deductive databases, data language complexity, treatment of incomplete information, complex-value models, semantic models and classification, and temporal databases. Also offered as CS 589 and may be taken only once for credit. Expected preparation: CS 486 or CS 586 or equivalent course; familiarity with discrete math and logic that could be satisfied by CS 250/CS 251 or by Mth 356.

CS 695 - Network Routing (3)
Class will study modern packet-based routing protocols as used in the Internet including interior gateway protocols (IGPs) like RIPv1, RIPv2, OSPF, and exterior gateway protocols (EGPs) like BGP. Certain routing control theory topics will be introduced; for example, link-state and vector distance routing, policy routing, source routing and tunnels, and the general use of metrics in existing routing protocols. Other aspects of routing protocols may be presented as time permits; for example, multicast routing, mobile routing, and tag-switching protocols. This class may take the form of a seminar with students asked to present various aspects of recent experimental research in routing. Also offered as CS 595 and may be taken only once for credit.
Prerequisite: CS 594.

CS 696 - Network Management and Security (3)
Covers both network management and network security. Network management will include the design of LAN-based networks, including spanning tree protocols, bridge learning protocols, virtual LANs, and Ethernet switches, and the security of switches and routers. Network management protocols will be covered in-depth including switch and router management information bases, as well as associated SNMP protocols, and network monitoring tools. The second half of the class will focus on network security. In order to understand the network security problem, the security section will begin with a review of various forms of network attacks. We then turn to network-side security management including both passive measures like firewall defense schemes including packet filters, and bastion hosts. Newer secure protocols will then be covered including network-layer security and various application-layer secure protocols. Also offered as CS 596 and may be taken only once for credit.
Prerequisite: CS 594.

CS 699 - Special Studies (1-6)
Credit to be arranged.

Dane 101 - First-year Danish (4)
Beginning Danish. Emphasis on communication skills: listening, speaking, reading, writing. This is the first course in a sequence of three: Dane 101, Dane 102, and Dane 103.
Dane 102 - First-year Danish (4)
Beginning Danish. Emphasis on communication skills: listening, speaking, reading, writing. This is the second course in a sequence of three: Dane 101, Dane 102, and Dane 103.

Dane 103 - First-year Danish (4)
Beginning Danish. Emphasis on communication skills: listening, speaking, reading, writing. This is the third course in a sequence of three: Dane 101, Dane 102, and Dane 103.

Dane 199 - Special Studies (1-5)
(Credit to be arranged.)

Dane 201 - Second-year Danish (4)
Intensive review of basics introduced in first-year courses and further development of communication skills. This is the first course in a sequence of three: Dane 201, Dane 202, and Dane 203. Recommended prerequisite: Dane 103.

Dane 202 - Second-year Danish (4)
Intensive review of basics introduced in first-year courses and further development of communication skills. This is the second course in a sequence of three: Dane 201, Dane 202, and Dane 203. Recommended prerequisite: Dane 103.

Dane 203 - Second-year Danish (4)
Intensive review of basics introduced in first-year courses and further development of communication skills. This is the third course in a sequence of three: Dane 201, Dane 202, and Dane 203. Recommended prerequisite: Dane 103.

Dane 299 - Special Studies (1-5)
(Credit to be arranged.)

Dane 316 - Readings in Danish (2)
A variable-content course designed to give advanced students of Danish experience reading a variety of content areas. Taken in conjunction with regularly scheduled corequisite FLL courses taught in English. Recommended prerequisite: Dane 203.

Dane 345 - Hans Christian Andersen (4)
Studies the works of Hans Christian Andersen, paying particular attention to the tales.

Dane 345U - Hans Christian Andersen (4)
Studies the works of Hans Christian Andersen, paying particular attention to the tales. Recommended prerequisite: Sophomore Inquiry. Conducted in English.

Dane 346 - 20th Century Danish Women Writers (4)
Examination of works of 20th century Danish women writers with attention to themes, styles, and characteristics in light of the literary trends of their times and feminist criticism. Readings, lectures, and discussions in English.

Dane 346U - 20th Century Danish Women Writers (4)
Examination of works of 20th century Danish women writers with attention to themes, styles, and characteristics in light of the literary trends of their times and feminist criticism. Readings, lectures, and discussions in English.

Dane 347 - Major Works in Danish Literature (4)
Four centuries of Danish masterpieces with attention to themes, styles and characteristics in light of the literary trends of their times. Conducted in English.

Dane 347U - Major Works in Danish Literature (4)
Four centuries of Danish masterpieces with attention to themes, styles and characteristics in light of the literary trends of their times. Conducted in English. Recommended prerequisite: Sophomore Inquiry.

Dane 361 - Danish Films from Dreyer to Dogmer (4)
Examines a number of Danish films produced from 1928 to the present. Explores Denmark's position in the context of the world film industry as well as the Dogmer movement. Readings, lecture, and discussion in English.

Dane 361U - Danish Films from Dreyer to Dogmer (4)
Examines a number of Danish films produced from 1928 to the present. Explores Denmark's position in the context of the world film industry as well as the Dogmer movement. Readings, lecture, and discussion in English.

Dane 399 - Special Studies (1-6)
(Credit to be arranged.)

D - Dance

D 104 - Dance Appreciation (4)
Develop an awareness and appreciation of dance in its artistic, social and cultural contexts through a variety of experiences, viewing and participating in dance. Will cover the basic roles in dance along with concepts and principals such as space, time and effort as well as expression, form, style and period.

D 193 - Dance Laboratory: Modern I, II, III (2)
Beginning dance technique in topics to be named, for example musical theatre, tap, hip hop, etc. Maximum: 12 credits.

D 196 - Dance Laboratory: Ballet I, II, III (2)
Beginning ballet technique, emphasis on body alignment, development of basic technical skills, and understanding basic ballet vocabulary. Maximum: 12 credits.

D 197 - Dance Laboratory: Jazz I, II, III (2)
Beginning laboratory in jazz dance technique emphasizing body alignment, contraction, and isolation technique of Latin, West Indian, African and American rhythms. Maximum: 12 credits.

D 304 - Dance Appreciation (4)
Develop an awareness and appreciation of dance in its artistic, social and cultural contexts through a variety of experiences, viewing and participating in dance. Covers the basic roles involved in dance along with concepts and principals of dance such as space, time and effort as well as expression, form, style and period.

Prerequisite: Upper-division standing.

D 350 - Dance Improvisation (4)
An exploration of spontaneous movement as individual and group creativity and expression, as a potential performance form and as the beginnings of choreography. "The body thinks." Designed to develop
D 351 - Dance Composition (4)
Exploration of basic elements of dance and choreographic strategies through readings, observations and preparation of solo dance studies. Expected preparation: upper division standing.

D 352 - Dance Choreography (4)

D 355 - Dance Production (4)
Introductory course covering technology for the production of dance. Students will gain a working knowledge of theatre terminology and a familiarity with basic tools and techniques for props, set pieces, costumes, lighting, audio, video, stage management and marketing for a public performance. Students will produce the choreography class concert.

D 362 - Contemporary Dance 1920 to Present (4)
Historical foundations for the development of current dance forms. Contemporary dance styles and theories will be studied via lectures and videos, field trips to exhibits and concerts. Expected preparation: upper division standing.

D 362U - Contemporary Dance 1920 to Present (4)
Historical foundations for the development of current dance forms. Contemporary dance styles and theories will be studied via lectures and videos, field trips to exhibits and concerts. Expected preparation: upper division standing.

D 366U - Dance in Film: Early Years through the 1940s (4)
Focus on the Hollywood musical genre, early years of film to 40’s, including choreographers, performers, dance styles, what role the dance serves in the films, what defines the genre and how it developed, the social cultural connections, industry practices, dance history - popular trends to modern dance. Also cultural context, concurrent historical events, social trends, innovations, politics.

D 367U - Dance in Film: 1940s to Present (4)
Focus on dance in popular film, 1948 to present, including choreographers, performers, dance styles, role dance serves in the films, social cultural connections, dance history - popular trends to modern dance. Will consider cultural context - concurrent historical events, social trends, innovations, politics.

D 367 - Dance in Film: 1940s to Present (4)
Focus on dance in popular film, 1948 to present, including choreographers, performers, dance styles, role dance serves in the films, social cultural connections, dance history - popular trends to modern dance. Will consider cultural context - concurrent historical events, social trends, innovations, politics.

D 393 - Dance Laboratory: Modern I, II, III (2)
Intermediate modern dance technique, emphasis on body alignment, strength, flexibility and development of intermediate level technical skills. Maximum: 12 credits. Expected preparation: D 193 I, II, III or previous dance experience.

D 396 - Dance Laboratory: Ballet I, II, III (2)
Intermediate level ballet technique. Emphasis on execution and application of all basic ballet vocabulary and on alignment and skill development. Maximum: 12 credits. Prerequisite: low-intermediate technique required; D 196.

D 397 - Dance Laboratory: Jazz I, II, III (2)
Intermediate laboratory in jazz dance technique emphasizing body alignment, contraction, and isolation technique of Latin, West Indian, and American rhythms. Maximum: 12 credits. Prerequisite: D 197.

D 399 - Special Studies (1-12)
(Credit to be arranged.)

D 405 - Reading & Conference (1-8)
(Credit to be arranged.)

EAS - Engineering & Applied Science

EAS 101 - Engineering Problem Solving (4)
Introduction to basic ideas and tools used in the engineering profession. Basic preparation in rudiments and working methods of engineering design, analysis, and problem solving, with emphasis on developing skills in computer-aided problem solving methods utilizing tools such as MATLAB, Mathcad, and EXCEL. Introduction to structured computer programming methods via MATLAB scripting language. Lecture and recitation. Prerequisite: Mth 112.

EAS 101R - Recitation: Engineering Problem Solving (0)
Recitation for EAS 101 Engineering Problem Solving.
Corequisite: EAS 101.

EAS 102 - Engineering Computation Structures (4)

EAS 115 - Engineering Graphics (3)
The graphic language applied to engineering. Projection systems. Multiview and pictorial representation. Introduction to computer graphics. Lecture and laboratory.

EAS 115L - Engineering Graphics Lab (0)

EAS 199 - Special Studies (1-4)
(Credit to be arranged.) Consent of instructor.
EAS 211 - Statics (4)
Principles and applications of static equilibrium to structures and machines.

EAS 212 - Strength of Materials (4)
Study of the relationship between strain and stress in deformable bodies; principles of stress analysis for axial force, flexure, torsion, and shear; studies in combined stresses and column stability.
Prerequisite: EAS 211, Mth 261.

EAS 213L - Properties of Materials Lab (0)
Lab for EAS 213 Property of Materials.
Corequisite: EAS 213.

EAS 215 - Dynamics (4)
Fundamental principles and methods of Newtonian mechanics including kinematics and kinetics of motion and the conservation laws of mechanics. Basic particle and rigid body applications.
Prerequisite: EAS 211, Mth 252, Mth 261.

EAS 333 - Problems, Solutions, and Systems Thinking (4)
Provides the basis of systems thinking, foundational in addressing modern challenges. Develops skills, through diverse team and individual exploration in real-world applications, to assist in understanding vague problems, examine causes and solutions to complex scenarios. Gives an appreciation of systems thinking and the foundational philosophy of a modern learning organization.

EAS 333U - Problems, Solutions, and Systems Thinking (4)
Provides the basis of systems thinking, foundational in addressing modern challenges. Develops skills, through diverse team and individual exploration in real-world applications, to assist in understanding vague problems, examine causes and solutions to complex scenarios. Gives an appreciation of systems thinking and the foundational philosophy of a modern learning organization.

EAS 361 - Fluid Mechanics (4)
Properties of fluid; fluid statics; differential analysis; conservation of mass, energy, and momentum; dimensional analysis; and fluid metering.
Prerequisite: EAS 215, Mth 256 taken concurrently. Lecture and laboratory.

EAS 361L - Fluid Mechanics Lab (0)
Lab for Fluid Mechanics.

EAS 401 - Research (1-6)
(Credit to be arranged.) Consent of instructor.

EAS 405 - Reading and Conference (1-6)
(Credit to be arranged.) Consent of instructor.

EAS 406 - Special Projects (1-6)
(Credit to be arranged.) Consent of instructor.

EAS 407 - Seminar (0-6)
(Credit to be arranged.) Consent of instructor.

EAS 410 - Selected Topics (1-6)
(Credit to be arranged.) Consent of instructor.

EAS 461 - Reliability Engineering (4)
Design of reliable components and systems for engineering fields. Includes elements of probability and statistics, reliability, mathematics, failure modes and effect analysis; and design for given reliabilities under constraints. Also offered for graduate-level credit as EAS 561 and may be taken only once for credit.
Prerequisite: senior standing in engineering.

Ec - Economics

Ec 200 - Contemporary Economic Issues (4)
Introduction to the economic approach to current political and economic issues. Topics will vary depending upon the instructor, but may include markets and competition, sustainable development and growth, poverty and inequality, government policy, international economic relationships, the economic approach to environmental protection.

Ec 201 - Principles of Microeconomics (4)
A study of the choices individuals face as participants in the markets for goods, services and factors of production like labor; behavior of profit-maximizing firms operating in markets with varying degrees of competitive pressure; potential role of government in intervening to influence market outcomes using taxes and subsidies; reasons for international trade and economic inequality.

Ec 201H - Honors Principles of Microeconomics
A study of the market system, involving the essentials of demand and supply analysis; competition and monopoly; labor public policy toward business; the distribution of income; international trade and commercial policy; comparative advantage, tariffs, and quotas.

Ec 202 - Principles of Macroeconomics (4)
A study of factors affecting the level of national income: the essentials of money and banking; the role of government expenditure and taxation in achieving economic stability, growth, and development; international monetary issues including exchange rates and the balance of payments.
Prerequisite: Ec 201.

Ec 202H - Honors Principles of Macroeconomics
A study of factors affecting the level of national income: the essentials of money and banking; the role of government expenditure and taxation in achieving economic stability, growth, and development; international monetary issues including exchange rates and the balance of payments.
Prerequisite: Prerequisites: Ec 201.
Ec 311 - Microeconomic Theory (4)

Theories of consumer behaviour and demand, production and cost, the firm and market organization, strategic behavior, and functional income distribution.

Prerequisite: Ec 201.

Ec 312 - Macroeconomic Theory (4)

Tools and models to analyze factors influencing the levels of output, employment and prices. Fundamentals of the theory of business cycles, economic growth, and inflation. The role of government in solving macroeconomic problems.

Prerequisite: Ec 202; Ec 311 or Ec 415 or consent of instructor.

Ec 314 - Private and Public Investment Analysis (4)

Examines the tools required to analyze expenditures that yield benefits over time-investments. The use of accounting documents and a focus on the time value of money allows students to analyze choices in a variety of security, loan, and equipment investment decisions.

Ec 314U - Private and Public Investment Analysis (4)

Examines the tools required to analyze expenditures that yield benefits over time-investments. The use of accounting documents and a focus on the time value of money allows students to analyze choices in a variety of security, loan, and equipment investment decisions.

Ec 316 - Introduction to Health Care Economics (4)

Provides an introduction to basic economic concepts that are most relevant to the study of the health care system. Examines the efficiency and equity implications of providing health care under the traditional fee-for-service system versus providing health care under the relatively new systems of health care delivery such as health maintenance organizations (HMOs), preferred provider organizations (PPOs), etc. Compares the American health care system to the systems employed in other developed countries. Special attention will be paid to the delivery of health care in Oregon.

Ec 316U - Introduction to Health Care Economics (4)

Provides an introduction to basic economic concepts that are most relevant to the study of the health care system. Examines the efficiency and equity implications of providing health care under the traditional fee-for-service system versus providing health care under the relatively new systems of health care delivery such as health maintenance organizations (HMOs), preferred provider organizations (PPOs), etc. Compares the American health care system to the systems employed in other developed countries. Special attention will be paid to the delivery of health care in Oregon.

Ec 317 - International Economics (4)

Examines trade and financial relations among countries with an emphasis on policy perspectives. Outlines international policy options and the principles that govern world trade and financial arrangements. Regional and international trade organizations and currency arrangements will be discussed. Credit is not given for both Ec 340 and Ec 440 or Ec 441.

Ec 345 - Marxist Political Economy (4)

An inquiry into the contribution to social and economic thought advanced by Karl Marx. Based on reading and interpreting primary sources. Considers the legacy of Marx’s ideas on the course of history in the 20th century, and the potential influence in the 21st century.

Ec 350 - Economics of Developing Countries (4)

The economics of most of the world. Examines the concept and history of development, the causes of economic growth, poverty and inequality, population growth, education and health, sustainable development, the impact of international trade, and foreign aid.

Ec 350U - Economics of Developing Countries (4)

The economics of most of the world. Examines the concept and history of development, the causes of economic growth, poverty and inequality, population growth, education and health, sustainable development, the impact of international trade, and foreign aid.

Ec 380 - Introduction to Mathematical Economics (4)

Economic concepts are explored using mathematical methods. Applications are drawn from a wide range of fields in economics including microeconomics, macroeconomics, economic growth, international trade, international finance, labor and environmental economics, industrial organization and development economics. Mathematical methods utilized include equations, functions, sets, total and partial differentiation, and linear algebra.

Prerequisite: Mth 251, Ec 201, Ec 202.

Ec 399 - Special Studies (1-6)

See department for course description. (Credit to be arranged.)

Ec 401 - Research (1-6)

Consent of instructor. See department for course description. (Credit to be arranged.)
Ec 403 - Honors Thesis (1-4)
Consent of instructor. See department for course description. (Credit to be arranged.)

Ec 404 - Cooperative Education/Internship (1-12)
By prior arrangement with a faculty member, economics majors may integrate their practical experience with an economics issue into their academic education. Students are expected to provide a brief proposal of the topic they wish to pursue, demonstrating some familiarity with the economics literature in the area and the way in which their internship or other experience will illustrate practical aspects of the proposed topic. Evaluation on the basis of written and oral syntheses of academic and practical knowledge. Only in unusual circumstances will more than 4 credits be granted for cooperative education/internship.
Prerequisite: Ec 201, 202, and consent of instructor. (Credit to be arranged.)

Ec 405 - Reading and Conference (1-6)
Consent of instructor. See department for course description. (Credit to be arranged.)

Ec 407 - Seminar (1-6)
Consent of instructor. See department for course description. (Credit to be arranged.)

Ec 409 - Practicum (1-3)
By prior arrangement with the department, economics majors may receive a maximum of 3 credits in their total undergraduate program for economics research done in the community in conjunction with guided reading and regular consultations with the practicum instructor. Recommended prerequisites: Ec 201, 202, and consent of instructor. (Credit to be arranged.)

Ec 410 - Selected Topics (1-6)
See department for course description. (Credit to be arranged.)

Ec 410U - Selected Topics (4)
(Credit to be arranged.)

Ec 417 - Women in the Economy (4)
Different economic theoretical perspectives are presented to account for women's particular economic roles currently and historically. Emphasis on women's responsibility for child rearing and housework; women's relatively low wages; occupational segregation by gender; economic differences among women due to ethnicity, generation, and class; and policy issues with particular importance for women's economic situation. Also offered for graduate-level credit as Ec 517 and may be taken only once for credit. Expected preparation: Ec 201.
Prerequisite: junior standing.

Ec 418 - Economics Department Seminar (1)
Economics majors, minors, graduate students and other students currently enrolled in an economics course may enroll in the Economics Department Seminar, which brings academic and professional economists to campus to present research on a wide variety of topics, using the spectrum of methodological approaches. Also offered for graduate-level credit as Ec 518.
Prerequisite: Ec 201 or consent of instructor.

Ec 419 - Economics of Race and Ethnicity (4)
Survey of the economic history of ethnic groups in the United States, various economic theoretical perspectives advanced to account for past and current experience of people of color in the U.S. economy, and examination of selected economic policy issues. Also offered for graduate-level credit as Ec 519 and may be taken only once for credit. Expected preparation: Ec 201.

Ec 420 - Money And Banking (4)
Functional and empirical definitions of money and interest rates. Characteristics and role of bank and non-bank financial institutions in determining the level of money and interest rates. History of the Federal Reserve System. Instruments of monetary control by the Federal Reserve. Alternative models of monetary influence on the economy. Also offered for graduate-level credit as Ec 520 and may be taken only once for credit.
Prerequisite: Ec 201, Ec 202, Ec 312 or consent of instructor.

Ec 425 - Economics of Industrial Organization (4)
Application of microeconomic theory to analysis of firms, markets, and industries. Economic explanations for structure of markets and behavior of firms that trade in them. Internal organization of firms and assessment of efficiency of markets in determining organization. Also offered for graduate credit as Ec 525 and may be taken only once for credit.
Prerequisite: Ec 201; Ec 311 or Ec 415, or consent of instructor.

Ec 426 - Economics of Regulation (4)
Study of government regulation designed to control-or at least to influence-the performance of the market in specific ways. Historical and economic analyses of three main forms of regulation: direct regulation of monopoly and competition, and social regulation to protect the environment and the individual. Also offered for graduate credit as Ec 526 and may be taken only once for credit. Expected preparation: Ec 201.

Ec 427 - Cost-Benefit Analysis (4)
Main theory and empirical methodologies for assessing costs and benefits of projects with varying timeframes and levels of uncertainty. Focus on public projects, including environmental, infrastructure and social service activities. Methodologies for valuation of nonmarket goods, such as environmental services, also covered. Also offered for graduate-level credit as Ec 527 and may be taken only once for credit.
Prerequisite: Ec 201.

Ec 428 - Project Evaluation (4)
Methodology for program evaluation from needs assessment through outcome and effectiveness evaluation. Heavy reliance on case studies. Students may participate in ongoing evaluations. Also offered for graduate-level credit as Ec 528 and may be taken only once for credit.
Prerequisite: Ec 311, Ec 415 or consent of instructor.

Ec 430 - Resource and Environmental Economics (4)
Overview of different approaches to economic analysis of resources and environment, and fundamental issues of economy/environment interactions, as well as the emerging subject of sustainability. Covers the basics of standard environmental and resource economics including the theory of externalities, resource allocation over time, common property resources, public goods and valuation. Includes an overview of the economic dimension of policies designed to protect and improve environmental...
quality and protect and efficiently manage
natural resources. Also offered for graduate
credit as Ec 530 and may be taken only once
for credit.

Prerequisite: Ec 201.

Ec 431 - Urban Economics (4)

Functions of the urban economy; the market
sector and the public sector. Land use,
environmental quality, transportation,
housing, income distribution, the
organization and financing of urban public
services. Also offered for graduate credit as
Ec 531; this is the same course as USP 431
and RE 431 and may be taken only once for

Prerequisite: Upper-division standing.
Crosslisted as: USP 431 and RE 431.

Ec 432 - Advanced Environmental
Economics (4)

Examination of the economics of
environmental degradation, externalities
and pollution control. Emphasis is on the
theoretical aspects of market failure,
policies/regulations to promote efficient
outcomes and policy applications. Also
offered for graduate-level credit as Ec 532
and may be taken only once for credit.
Expected preparation: Ec 469 or equivalent.

Prerequisite: Ec 311 or Ec 415, and Ec 430 or
permission of instructor.

Ec 433 - Advanced Natural Resource
Economics (4)

Analyze natural resource production,
extration and use. Focus on resources such
as land, minerals, forests, fisheries and
wildlife. Problems achieving sustainability.
Regional, national and international case
studies used to illustrate key policy issues.
Also offered for graduate-level credit as Ec
533; this is the same course as ESM 433 and
may be taken only once for credit.
Recommended preparation: Ec 469.

Prerequisite: Ec 311 or Ec 415, and Ec 430 or
Ec 530. Crosslisted as: ESM 433.

Ec 434 - Business Environmental
Management Economics (4)

Examines the economic costs and benefits
that affect the decisions of business firms to
develop integrated environmental
management systems. Analysis of policy
options to foster business environmental
management for public goods. Case studies
of selected firms. Also offered for graduate-
level credit as Ec 534; this is the same course
as ESM 434 and may be taken only once for
credit. Recommended: Ec 201.

Crosslisted as: ESM 434.

Ec 435 - Public Spending and Debt Policy (4)

Analysis of the role of the state in a
competitive economy. Development of
decision rules for state economic action.
Includes a detailed study of the principles of
voting, public budgeting including cost
benefit analysis and PPBS, the theory of
fiscal federalism and the theory and
principles of public debts. Also offered for
graduate-level credit as Ec 535 and may be
taken only once for credit. Recommended:
Ec 201, 202.

Ec 436 - Taxation and Income Policies (4)

Principles and problems of government
financing. Critical analysis of alternative
taxes as sources of public revenue with
emphasis on theories of incidence and
economic effect. Also offered for graduate-
level credit as Ec 536 and may be taken only
for credit. Recommended: Ec 201, Ec 202.

Ec 437 - Public Utility Economics (4)

Examines the rationale, economic principles,
and institutions of historic economic
regulation. Contemporary theory of the firm
and microeconomic pricing are analyzed.
Technological changes suggest that to
achieve economic efficiency it may no longer
be necessary or appropriate to subject
energy and telecommunications firms to
traditional utility regulation. There is
academic enthusiasm for displacing
economic regulation with competition.
Deregulation and restructuring are explored
with emphasis on contemporary issues in
Oregon, the Pacific Northwest, and the
nation. In particular, difficulties in
transformation to the marketplace will be
examined. Expert guest lecturers from the
utility and regulatory communities will be
scheduled, and contemporary scholarly
literature will be reviewed. Also offered for
graduate-level credit as Ec 537 and may be
taken only once for credit. Recommended:
Ec 201, 202.

Ec 438 - Energy Economics (4)

Economics and structure of energy markets,
with a focus on electricity. Examines current
policy issues arising from energy production
and use. Also offered for graduate-level
credit as Ec 538 and may be taken only once
for credit.

Prerequisite: Ec 311 or Ec 415.

Ec 440 - International Trade Theory and
Policy (4)

Theories of international trade. Analysis of
the normative aspects of trade including the
igns from trade and the effect of trade on
economic welfare. Examination of
international trade policy and issues of
economic integration, economic growth, and
current trade problems. Also offered for
graduate-level credit as Ec 540 and may be
taken only once for credit.

Prerequisite: Ec 201; Ec 311 or Ec 415 or
consent of instructor.

Ec 441 - International Monetary Theory and
Policy (4)

Balance of payments theory including
balance of payments accounting and foreign
exchange market; theoretical models of
fixed and flexible exchange rate systems
using both Neoclassical and Keynesian
approaches. Historical evolution of the
international monetary system. Current
international monetary policies and
problems. Also offered for graduate-level
credit as Ec 541 and may be taken only once
for credit.

Prerequisite: Ec 201, Ec 202; Ec 312 or
consent of instructor.

Ec 442 - The Multinational Enterprise in the
World Economy (4)

The study of the multinational
(transnational) enterprise as a form of direct
foreign investment. Analysis of theories of
direct investment; the impact of the
multinational enterprise on the national and
international economy and the relationship
of such firms to the concept of the nation-
state. Also offered for graduate-level credit
as Ec 542 and may be taken only once for
credit. Recommended: Ec 201, Ec 202.

Ec 443 - Global Environmental Economics
(4)

An examination of economic forces and
theories to understand the causes of global
environmental problems and evaluate policy
options. Primary emphasis is on developing
countries and countries in transition, though
linkages with developed countries also considered. Topics include poverty, population, economic development and the environment, global warming, biodiversity protection, sustainability, and pollution control. Also offered for graduate-level credit as Ec 543; this is the same course as ESM 443 and may be taken only once for credit.

Ec 444 - Economics of Green Power (4)
The economic feasibility and rationale of producing electricity using several alternative environmentally friendly technologies. The economic and environmental costs and benefits of employing these technologies are identified and compared to the dominant technologies (coal, oil, hydropower). Alternative policies that provide incentives for the adoption of green technologies are examined. Also offered for graduate-level credit as Ec 544 and may be taken only once for credit. Recommended: Ec 201.

Ec 445 - Comparative Economic Systems (4)
Introduces the evolutionary-institutional method of analysis, incorporating history, the legacy of ideas, and the dynamics of change over time. Using this method, we shall examine economic systems of Ancient Rome, Medieval Feudalism, the Laissez-Faire Market Economy, Fascist Command Economy, and others. Also offered for graduate-level credit as Ec 545 and may be taken only once for credit. Recommended: Ec 201, 202.

Ec 446 - Institutional Economics (4)
Considers the contributions of seminal thinkers to what is regarded as an alternate or heterodox school in economic science. Contribution of Thorstein Veblen, John R. Commons, Wesley Mitchell, Simon Kuznets, Clarence Ayres, Gunnar Myrdal, and John Kenneth Galbraith, as well as more contemporary thinkers will be explored. Institutional theory will be compared and contrasted with neoclassical economics, and shown as a viable theory posing a formidable challenge to the dominant paradigm of orthodoxy. Neo-institutionalist challenges will also be considered. Also offered for graduate-level credit as Ec 546 and may be taken only once for credit.

Ec 447 - Economics of Transition (4)
Examines the formation of the Soviet-type economic system in the 1920s and 30s and its dissemination after World War II to Eastern Europe, China, and other selected countries. Emphasis is placed on the history of ideas and the historical setting which gave rise to the Soviet model. Includes the examination of the internal contradictions of the model, the “unwinding” of planned socialism, and the prospects for the move toward mixed market economies. Also offered for graduate-level credit as Ec 547 and may be taken only once for credit. Recommended: Ec 201, Ec 202.

Ec 448 - East Asian Economic Development (4)
Key topics in the development of East Asian economies, especially, Japan, China, South Korea, and several Southeast Asian countries. Economic theory will be applied to investigate the validity of the “Asian economic growth model,” while examining political, social and historical factors of the area and comparing the experience of these economies with that of other developing countries. Also offered for graduate-level credit as Ec 548 and may be taken only once for credit.

Ec 450 - Economics of Development (4)
Examines problems of post-colonial legacy: underdevelopment and persistent poverty. Rapid population growth, uneven development, capital flight, dual economy, brain drain. Industrialization strategies, foreign trade, education and human capital, population slowdown, microcredit institutions, role of women. Also offered for graduate-level credit as Ec 550 and may be taken only once for credit. Prerequisite: Ec 201, 202.

Ec 453 - Theory of Economic Growth (4)
Introduction to the theory of economic growth. This course will emphasize the theoretical basis and the models developed to measure growth and change in modern industrial societies. Also offered for graduate-level credit as Ec 553 and may be taken only once for credit. Recommended: Ec 201, 202.

Ec 456 - American Economic History: the First Century (4)
The economic background of the War of Independence and the seeds of the Civil War. Industrialization, urbanization, and development of the frontier. Rise of big business and organized labor. Laissez-faire, federalism, and the gradual emergence of the national government in economic policy. Changes in foreign trade and in the international position of the U.S. Also offered for graduate-level credit as Ec 556 and may be taken only once for credit. Recommended: Ec 201, 202.

Ec 457 - American Economic History: the 20th Century (4)

Ec 460 - History of Economic Thought (4)
Selections from the economic writings of various thinkers from antiquity through the Reformation. A survey of the work of the most important economic theorists of the 18th, 19th, and 20th centuries including Adam Smith, Ricardo, Marx, Marshall, Veblen, and Keynes. Readings include original writings and interpretations by later economists. Scholars will be studied in terms of their historical context and the contemporary relevance of the theories and policy recommendations. Also offered for graduate-level credit as Ec 560 and may be taken only once for credit. Recommended: Ec 201, 202.

Ec 465 - Labor Economics (4)
This course investigates the determinants of wages, the decision to work, the reasons demographic groups fare differently in the labor market, and sources of unemployment. Also considers current developments in labor markets of increasing wage inequality, globalization, declining unionization, and widespread use of new technologies. Also offered for graduate-level
credit as Ec 565 and may be taken only once for credit.
Prerequisite: Econ 201; Econ 311 or Ec 415 or consent of instructor.

Ec 469 - Introduction to Econometrics (4)
General survey of empirical techniques useful for economic analysis. Focus on the applications of mathematical tools and regression analysis in economics. Quantitative topics will be introduced systematically with hands-on case studies and examples related to the fields of economics, public policy, and urban studies. This course will not be counted as credit for economics graduate students, but may be taken by graduate students in other programs. Also offered for graduate-level credit as Ec 569 and may be taken only once for credit.
Prerequisite: Ec 201, Ec 202, Mth 251, Stat 243 and Stat 244.

Ec 472 - Time Series Analysis and Forecasts (4)
Time series analysis, emphasizing model identification, estimation, and forecasting. Non-stationary time series analysis includes unit root and cointegration tests. Techniques of moving average, differencing, and autocorrelation adjustment are introduced. Diagnostic checking following the model evaluation provides the base model for forecasting. Also offered for graduate-level credit as Ec 572 and may be taken only once for credit. Recommended: Ec 370 for Ec 472, Ec 570 for Ec 572.

Ec 480 - Mathematical Economics (4)
Mathematics for Economists. Application of differential calculus and matrix algebra to economics. Topics include consumer theory, production functions, and applied general equilibrium models. Also offered for graduate-level credit as Ec 580 and may be taken only once for credit.
Prerequisite: Ec 311 or Ec 415; Ec 312, and Ec 380 (or equivalently: Mth 251, Mth 252, and Mth 261, in place of Ec 380).

Ec 501 - Research (1-9)
Consent of instructor. See department for course description. (Credit to be arranged.)

Ec 503 - Thesis (1-9)
See department for course description. (Credit to be arranged.)

Ec 504 - Cooperative Education/Internship (1-9)
By prior arrangement with a faculty member, economics majors may integrate their practical experience with an economics issue into their academic education. Students are expected to provide a brief proposal of the topic they wish to pursue, demonstrating some familiarity with the economics literature in the area and the way in which their internship or other experience will illustrate practical aspects of the proposed topic. Evaluation on the basis of written and oral syntheses of academic and practical knowledge. Only in unusual circumstances will more than 4 credits be granted for cooperative education/internship.
Prerequisite: Ec 201, Ec 202, and consent of instructor. (Credit to be arranged.)

Ec 505 - Reading and Conference (1-6)
Consent of instructor. See department for course description. (Credit to be arranged.)

Ec 506 - Special Projects (1-9)
(Credit to be arranged.)

Ec 507 - Seminar (1-6)
Consent of instructor. See department for course description. (Credit to be arranged.)

Ec 510 - Selected Topics (1-5)
See department for course description. (Credit to be arranged.)

Ec 517 - Women in the Economy (4)
Different economic theoretical perspectives are presented to account for women's particular economic roles currently and historically. Emphasis on women's responsibility for child rearing and housework; women's relatively low wages; occupational segregation by gender; economic differences among women due to ethnicity, generation, and class; and policy issues with particular importance for women's economic situation. Also offered for undergraduate-level credit as Ec 417 and may be taken only once for credit. Expected preparation: Ec 201.

Ec 518 - Economics Department Seminar (1)
Economics majors, minors, graduate students and other students currently enrolled in an economics course may enroll in the Economics Department Seminar, which brings academic and professional economists to campus to present research on a wide variety of topics, using the spectrum of methodological approaches. Also offered for undergraduate-level credit as Ec 418.
Prerequisite: junior standing.

Ec 519 - Economics of Race and Ethnicity (4)
Survey of the economic history of ethnic groups in the United States, various economic theoretical perspectives advanced to account for past and current experience of people of color in the U.S. economy, and examination of selected economic policy issues. Also offered for undergraduate-level credit as Ec 419 and may be taken only once for credit. Expected preparation: Ec 201.

Ec 520 - Money And Banking (4)
Functional and empirical definitions of money and interest rates. Characteristics and role of bank and non-bank financial institutions in determining the level of money and interest rates. History of the Federal Reserve System. Instruments of monetary control by the Federal Reserve. Alternative models of monetary influence on the economy. Also offered for undergraduate-level credit as Ec 420 and may be taken only once for credit.
Prerequisite: Ec 201, Ec 202, Ec 312 or consent of instructor.

Ec 522 - Economics of Sustainability: Theory and Practice (4)
Economic concepts and theories for analyzing sustainable development, including the emerging field of ecological economics. Roles and practices of the business, government and nonprofit sectors in fostering sustainability.

Ec 525 - Economics of Industrial Organization (4)
determining organization. Also offered for undergraduate credit as Ec 425 and may be taken only once for credit.

Ec 526 - Economics of Regulation (4)
Study of government regulation designed to control-or at least to influence-the performance of the market in specific ways. Historical and economic analyses of three main forms of regulation: direct regulation of monopoly and competition, and social regulation to protect the environment and the individual. Also offered for undergraduate credit as Ec 426 and may be taken only once for credit. Prerequisite: Ec 201.

Ec 527 - Cost-Benefit Analysis (4)
Main theory and empirical methodologies for assessing costs and benefits of projects with varying timeframes and levels of uncertainty. Focus on public projects, including environmental, infrastructure and social service activities. Methodologies for valuation of nonmarket goods, such as environmental services, also covered. Also offered as undergraduate-level credit as Ec 427 and may be taken only once for credit. Prerequisite: Ec 201.

Ec 528 - Project Evaluation (4)
Methodology for program evaluation from needs assessment through outcome and effectiveness evaluation. Heavy reliance on case studies. Students may participate in ongoing evaluations. Also offered for undergraduate-level credit as Ec 428 and may be taken only once for credit.

Ec 530 - Resource and Environmental Economics (4)
Overview of different approaches to economic analysis of resources and environment, and fundamental issues of economy/environment interactions, as well as the emerging subject of sustainability. Covers the basics of standard environmental and resource economics including the theory of externalities, resource allocation over time, common property resources, public goods and valuation. Includes an overview of the economic dimension of policies designed to protect and improve environmental quality and protect and efficiently manage natural resources. Also offered for undergraduate credit as Ec 430 and may be taken only once for credit. Prerequisite: Ec 201.

Ec 531 - Urban Economics (4)
Functions of the urban economy; the market sector and the public sector. Land use, environmental quality, transportation, housing, income distribution, the organization and financing of urban public services. Also offered for undergraduate credit as Ec 431 and may be taken only once for credit. Recommended: Ec 201, 202.

Ec 532 - Advanced Environmental Economics (4)
Examination of the economics of environmental degradation, externalities and pollution control. Emphasis is on the theoretical aspects of market failure, policies/regulations to promote efficient outcomes and policy applications. Also offered for undergraduate-level credit as Ec 432 and may be taken only once for credit. Crosslisted as: ESM 532.

Ec 533 - Advanced Natural Resource Economics (4)
Analyze natural resource production, extraction and use. Focus on resources such as land, minerals, forests, fisheries and wildlife. Problems achieving sustainability. Regional, national and international case studies used to illustrate key policy issues. Also offered for undergraduate-level credit as Ec 433; this is the same course as ESM 533 and may be taken only once for credit. Crosslisted as: ESM 533.

Ec 534 - Business Environmental Management Economics (4)
Examines the economic costs and benefits that affect the decisions of business firms to develop integrated environmental management systems. Analysis of policy options to foster business environmental management for public goods. Case studies of selected firms. Also offered for undergraduate-level credit as Ec 434 and may be taken only once for credit. Recommended: Ec 201.

Ec 535 - Public Spending and Debt Policy (4)
Analysis of the role of the state in a competitive economy. Development of decision rules for state economic action. Includes a detailed study of the principles of voting, public budgeting including cost benefit analysis and PPBS, the theory of fiscal federalism and the theory and principles of public debts. Also offered for undergraduate-level credit as Ec 435 and may be taken only once for credit. Recommended: Ec 201, 202.

Ec 536 - Taxation and Income Policies (4)
Principles and problems of government financing. Critical analysis of alternative taxes as sources of public revenue with emphasis on theories of incidence and economic effect. Also offered for undergraduate-level credit as Ec 436 and may be taken only once for credit. Recommended: Ec 201, 202.

Ec 537 - Public Utility Economics (4)
Examines the rationale, economic principles, and institutions of historic economic regulation. Contemporary theory of the firm and microeconomic pricing are analyzed. Technological changes suggest that to achieve economic efficiency it may no longer be necessary or appropriate to subject energy and telecommunications firms to traditional utility regulation. There is academic enthusiasm for displacing economic regulation with competition. Deregulation and restructuring are explored with emphasis on contemporary issues in Oregon, the Pacific Northwest, and the nation. In particular, difficulties in transformation to the marketplace will be examined. Expert guest lecturers from the utility and regulatory communities will be scheduled, and contemporary scholarly literature will be reviewed. Also offered for undergraduate-level credit as Ec 437 and may be taken only once for credit. Recommended: Ec 201, 202.

Ec 538 - Energy Economics (4)
Economics and structure of energy markets, with a focus on electricity. Examines current policy issues arising from energy production and use. Also offered for undergraduate-level credit as Ec 438 and may be taken only once for credit.

Ec 540 - International Trade Theory and Policy (4)
Theories of international trade. Analysis of the normative aspects of trade including the gains from trade and the effect of trade on economic welfare. Examination of international trade policy and issues of economic integration, economic growth, and current trade problems. Also offered for
undergraduate-level credit as Ec 440 and may be taken only once for credit.

Ec 541 - International Monetary Theory and Policy (4)
Balance of payments theory including balance of payments accounting and foreign exchange market; theoretical models of fixed and flexible exchange rate systems using both Neoclassical and Keynesian approaches. Historical evolution of the international monetary system. Current international monetary policies and problems. Also offered for undergraduate-level credit as Ec 441 and may be taken only once for credit.

Prerequisite: Ec 201, Ec 202; Ec 312 or consent of instructor.

Ec 542 - The Multinational Enterprise in the World Economy (4)
The study of the multinational (transnational) enterprise as a form of direct foreign investment. Analysis of theories of direct investment; the impact of the multinational enterprise on the national and international economy and the relationship of such firms to the concept of the nation-state. Also offered for undergraduate-level credit as Ec 442 and may be taken only once for credit. Recommended: Ec 201, Ec 202.

Ec 543 - Global Environmental Economics (4)
An examination of economic forces and theories to understand the causes of global environmental problems and evaluate policy options. Primary emphasis is on developing countries and countries in transition, though linkages with developed countries also considered. Topics include poverty, population, economic development and the environment, global warming, biodiversity protection, sustainability, and pollution control. Also offered for undergraduate-level credit as Ec 443; this is the same course as ESM 543 and may be taken only once for credit.

Crosslisted as: ESM 543.

Ec 544 - Economics of Green Power (4)
The economic feasibility and rationale of producing electricity using several alternative environmentally friendly technologies. The economic and environmental costs and benefits of employing these technologies are identified and compared to the dominant technologies (coal, oil, hydropower). Alternative policies that provide incentives for the adoption of green technologies are examined. Also offered for undergraduate-level credit as Ec 444 and may be taken only once for credit. Recommended: Ec 201.

Ec 545 - Comparative Economic Systems (4)
Introduces the evolutionary-institutional method of analysis, incorporating historical, the legacy of ideas, and the dynamics of change over time. Using this method, we shall examine economic systems of Ancient Rome, Medieval Feudalism, the Laissez-Faire Market Economy, Fascist Command Economy, and others. Also offered for undergraduate-level credit as Ec 445 and may be taken only once for credit. Recommended: Ec 201, 202.

Ec 546 - Institutional Economics (4)
Considers the contributions of seminal thinkers to what is regarded as an alternate or heterodox school in economic science. Contribution of Thorstein Veblen, John R. Commons, Wesley Mitchell, Simon Kuznets, Clarence Ayres, Gunnar Myrdal, and John Kenneth Galbraith, as well as more contemporary thinkers will be explored. Institutional theory will be compared and contrasted with neoclassical economics, and shown as a viable theory posing a formidable challenge to the dominant paradigm of orthodoxy. Neo-institutionalist challenges will also be considered. Also offered for undergraduate-level credit as Ec 446 and may be taken only once for credit.

Ec 547 - Economics of Transition (4)
Examines the formation of the Soviet-type economic system in the 1920s and 30s and its dissemination after World War II to Eastern Europe, China, and other selected countries. Emphasis is placed on the history of ideas and the historical setting which gave rise to the Soviet model. Includes the examination of the internal contradictions of the model, the "unwinding" of planned socialism, and the prospects for the move toward mixed market economies. Also offered for undergraduate-level credit as Ec 447 and may be taken only once for credit. Recommended: Ec 201, Ec 202.

Ec 548 - East Asian Economic Development (4)
Key topics in the development of East Asian economies, especially, Japan, China, South Korea, and several Southeast Asian countries. Economic theory will be applied to investigate the validity of the "Asian economic growth model," while examining political, social and historical factors of the area and comparing the experience of these economies with that of other developing countries. Also offered for undergraduate-level credit as Ec 448 and may be taken only once for credit.

Ec 550 - Economics of Development (4)
Examines problems of post-colonial legacy: underdevelopment and persistent poverty. Rapid population growth, uneven development, capital flight, dual economy, brain drain. Industrialization strategies, foreign trade, education and human capital, population slowdown, microcredit institutions, role of women. Also offered for undergraduate-level credit as Ec 450 and may be taken only once for credit.

Prerequisite: Ec 201, 202.

Ec 553 - Theory of Economic Growth (4)
Introduction to the theory of economic growth. This course will emphasize the theoretical basis and the models developed to measure growth and change in modern industrial societies. Also offered for undergraduate-level credit as Ec 453 and may be taken only once for credit. Recommended: Ec 201, 202.

Ec 556 - American Economic History: the First Century (4)
The economic background of the War of Independence and the seeds of the Civil War. Industrialization, urbanization, and development of the frontier. Rise of big business and organized labor. Laissez-faire, federalism, and the gradual emergence of the national government in economic policy. Changes in foreign trade and in the international position of the U.S. Also offered for undergraduate-level credit as Ec 456 and may be taken only once for credit. Recommended: Ec 201, 202.

Ec 557 - American Economic History: the 20th Century (4)
Economic impact of U.S. involvement in World War I. Postwar structural changes.

Ec 560 - History of Economic Thought (4)
Selections from the economic writings of various thinkers from antiquity through the Reformation. A survey of the work of the most important economic theorists of the 18th, 19th, and 20th centuries including Adam Smith, Ricardo, Marx, Marshall, Veblen, and Keynes. Readings include original writings and interpretations by later economists. Scholars will be studied in terms of their historical context and the contemporary relevance of the theories and policy recommendations. Also offered for undergraduate-level credit as Ec 460 and may be taken only once for credit.

Ec 565 - Labor Economics (4)
This course investigates the determinants of wages, the decision to work, the reasons demographic groups fare differently in the labor market, and sources of unemployment. Also considers current developments in labor markets of increasing wage inequality, globalization, declining unionization, and widespread use of new technologies. Also offered for undergraduate-level credit as Ec 465 and may be taken only once for credit.

Ec 569 - Introduction to Econometrics (4)
General survey of empirical techniques useful for economic analysis. Focus on the applications of mathematical tools and regression analysis in economics. Quantitative topics will be introduced systematically with hands-on case studies and examples related to the fields of economics, public policy, and urban studies. This course will not be counted as credit for economics graduate students, but may be taken by graduate students in other programs. Also offered for undergraduate-level credit as Ec 469 and may be taken only once for credit.

Prerequisite: Ec 201, Ec 202, Mth 251, Stat 243 and Stat 244.

Ec 570 - Econometrics (4)
Covers the theory and application of statistical regression, hypothesis testing, and simulation of econometric models. Emphases are placed on model construction and efficient use of economic data. Problems of multicollinearity, heteroscedasticity, autocorrelation, and distributed lags are discussed. Some familiarity with calculus, matrix algebra, and computer applications are assumed.

Prerequisite: Ec 469 or consent of instructor.

Ec 571 - Advanced Econometrics (4)
Advanced econometrics topics including systems of linear equations, panel data, nonlinear models, nonparametric estimation and prediction, and applications in consumption and production models. Data resources available to the practicing economist will be covered.

Prerequisite: Ec 469 or consent of instructor.

Ec 572 - Time Series Analysis and Forecasts (4)
Time series analysis, emphasizing model identification, estimation, and forecasting. Non-stationary time series analysis includes unit root and cointegration tests. Techniques of moving average, differencing, and autocorrelation adjustment are introduced. Diagnostic checking following the model evaluation provides the base model for forecasting. Also offered for undergraduate-level credit as Ec 472 and may be taken only once for credit. Recommended: Ec 370 for Ec 472, Ec 570 for Ec 572.

Ec 575 - Applied Advanced Econometrics (4)
Covers advanced topics related to methodological issues in econometrics, with emphases on computation, simulation, and non-linear methods in econometrics. Nonlinear econometric models including Box-Cox variable transformation, autoregressive time series analysis, and qualitative choice models. Simulation-based econometrics covers topics of Monte Carlo experiments and bootstrapping methods.

Prerequisite: Ec 570, Ec 571 or consent of instructor.

Ec 580 - Mathematical Economics (4)
Mathematics for Economists. Application of differential calculus and matrix algebra to economics. Topics include consumer theory, production functions, and applied general equilibrium models. Also offered for undergraduate-level credit as Ec 480 and may be taken only once for credit.

Ec 581 - Advanced Microeconomics (4)

Prerequisite: Ec 480/580 or consent of instructor.

Ec 584 - Applications of Advanced Microeconomic Theory (4)
Applies theories of consumer and producer behavior to a variety of real world problems. Different sub-disciplines of microeconomics will be covered, which may include two or three of the following: information economics, environmental economics, economics of regulation, industrial organization, law and economics, natural resource economics, labor economics, regional economics, urban economics, and the economics of contracting. For each sub-discipline covered, the most important economic model will be discussed and a review of major research studies and techniques will be undertaken.

Prerequisite: Ec 581 or consent of instructor.

Ec 590 - Advanced Macroeconomics (4)
Theories of national income, employment and price levels with special emphasis on recent developments in analytical techniques and empirical finding.

Prerequisite: Ec 480/580 or consent of instructor and Ec 581 or consent of instructor.

Ec 592 - Applications of Advanced Macroeconomic Theory (4)
Coverage includes current topics of interest in macroeconomics. The focus is on the applications of neoclassical and Keynesian theories of macroeconomic theory to a variety of real world problems. The various sub-disciplines of macroeconomics that may be covered include: Financial Economics, Monetary Economics, Economic Growth Models, Labor Economics, Public Finance, International Economics, and Radical Macroeconomic Thought.

Prerequisite: Ec 590 or consent of instructor.
Ec 596 - Research Project I (4)
Intended for graduate students to complete the field project requirement. Course activities include: independent reading on researchable field-related topics; individual development of a research project, i.e., selection of a subject and plan of study; and periodic reporting of individual research projects progress. This is the first course in a sequence of two: Ec 596 and Ec 597. Recommended: Ec 595.

Ec 597 - Research Project II (4)
Intended for graduate students to complete the field project requirement. Course activities include: independent reading on researchable field-related topics; individual development of a research project, i.e., selection of a subject and plan of study; and periodic reporting of individual research projects progress. This is the second course in a sequence of two: Ec 596 and Ec 597. Recommended: Ec 595.

Ec 675 - Advanced Macroeconomics II (4)
Extended analysis of macroeconomic theory covering static, deterministic models through recent dynamic and stochastic macro modeling. Analytic tools in both theoretic and empirical models are illustrated in the study of inflation, unemployment, growth and government policy. Recommended: Ec 575.

Ec 676 - Advanced Microeconomics II (4)
Extended analysis of microeconomic theory covering individual and social choice issues. Selected topics of interest and significance include but are not limited to: rational choice behavior of consumers and producers, theory of the market, partial and general equilibrium analysis, welfare economics, and economics of inflation. Recommended: Ec 576.

Ec 698 - Ecosystem Services Valuation: An Integrated Assessment (4)
Explore environmental, social and economic theories of valuation, quantitative and qualitative methods for incorporating the values into ecosystem service management decisions, novel approaches for integrating each type of values into comprehensive measures, and applications through interdisciplinary team projects. This is the same course as Mgmt 698; may only be taken once for credit.

Prerequisite: ESR 692, Soc 694 and Geog 694 or instructor’s permission. Crosslisted as: Mgmt 698.

ECE - Elect and Computer Engineering

ECE 101 - Exploring Electrical Engineering (4)
Freshman introductory course for students interested in electrical engineering. Students learn the design process, teamwork and presentation skills through completion of a hands-on project. Lab activities familiarize students with basic equipment and components. Speakers present an overview of different fields and career opportunities in electrical engineering.

ECE 102 - Engineering Computation (4)
Applying the principles of engineering analysis. Presenting technical content. Utilizing engineering software and writing scripts. Controlling external hardware via programming.

Prerequisite: MTH 111 with a grade of C or better, or passing at the necessary level on the mathematics placement test (see Math Department webpage at pdx.edu/math for information). .

ECE 103 - Engineering Programming (4)
Introduction to software design, algorithms, data structures, and programming using the "C" language. Interfacing to sensors, actuators, and other hardware. Writing documentation and presenting technical content. Recommended preparation: ECE 102.

Prerequisite: MTH 112 with a grade of C or better, or passing at the necessary level on the mathematics placement test (see Math Department webpage at pdx.edu/math for information). .

ECE 171 - Digital Circuits (4)
Foundation course in digital design. Topics such as number systems, basic logic gates, TTL device parameters, Boolean algebra, logic circuit simplification techniques, timing analysis, the application of MSI combinational logic devices, programmable logic devices, flip-flops, synchronous state machines and counters. Introduces students to a systematic design methodology. Uses computer based tools such as schematic capture programs, programmable logic development programs, and digital circuit stimulators.

Prerequisite: Mth 112 with a grade of C or better, or passing at the necessary level on the mathematics placement test (see Math Department webpage at pdx.edu/math for information). .

ECE 171R - Recitation for ECE 171 (0)
Recitation for ECE 171 Digital Circuits.

ECE 199 - Special Studies (0-4)
(Credit to be arranged.) Consent of instructor.

ECE 221 - Electric Circuit Analysis I (4)
Introduction to the basic methods of circuit analysis including Kirchhoff’s laws, resistive circuits, techniques of circuit analysis, operational amplifiers, and energy storage elements. Weekly lab.

Prerequisite: ECE 102, Mth 252. Corequisite: ECE 221L.

ECE 221L - Electric Circuit Analysis I Lab (0)
Lab for Electric Circuit Analysis I.

Corequisite: ECE 221.

ECE 221R - Recitation for ECE 221 (0)
Recitation for ECE 221 Electric Circuits.

ECE 222 - Electric Circuit Analysis II (4)

Prerequisite: ECE 221. Corequisite: ECE 222L.

ECE 222L - Electric Circuit Analysis II Lab (0)
Lab for Electric Circuit Analysis II.

Corequisite: ECE 222.

ECE 223 - Electric Circuit Analysis III (4)
Frequency response and ac power. Includes transfer functions, design of analog filters, Bode plot analysis, pole-zero diagrams, and ac and three-phase power. Weekly Lab.

Prerequisite: ECE 222. Corequisite: ECE 223L.

ECE 223L - Electric Circuit Analysis III Lab (0)
Lab for Electric Circuit Analysis III.

Corequisite: ECE 223.
ECE 241 - Introduction to Electrical Engineering (4)

DC circuit theory, passive electrical components, transient and sinusoidal steady state circuit responses, ac and three-phase power, op-amp circuits, and transformers; laboratory.

Prerequisite: Mth 252.

ECE 241L - Introduction to Electrical Engineering Lab (0)

Lab for ECE 241 Introduction to Electrical Engineering.

ECE 271 - Digital Systems (4)

Second course in a sequence of digital and microprocessor courses. Covers shift register devices and circuits; design, timing analysis, and application of synchronous state machine circuits using discrete devices and programmable logic devices; timing analysis of asynchronous state machines, arithmetic circuits and devices; internal architecture of a microprocessor; design and interfacing of memory systems; and an introduction to design for test techniques. Reinforces the systematic design methodology, documentation standards, and use of computer-based, tools introduced in ECE 171; weekly laboratory.

Prerequisite: ECE 171. Corequisite: ECE 271L.

ECE 271L - Lab for ECE 271 (0)

Lab for ECE 271 Digital Systems.

Corequisite: ECE 271.

ECE 290 - Special Studies (0-4)

(Credit to be arranged.) Consent of instructor.

ECE 311 - Feedback and Control (4)


Prerequisite: ECE 223, Mth 256.

ECE 311L - Lab for ECE 311 (0)

Lab for ECE 311 Feedback and Control.

ECE 312 - Fourier Analysis (4)

"Continuous-time and discrete-time Fourier series, continuous-time Fourier transform, discrete-time Fourier transform, fast Fourier transform, sampling, aliasing, communications, modulation, discrete-time filters. Prerequisite: ECE 223."

ECE 321 - Electronics I (4)

Introduction to solid state electronics, leading to the physical properties and characteristics of solid state electronic devices: diodes, bipolar junction transistors and field effect transistors. Analysis and design of rectifier topologies and biasing circuits. Application of a computer-aided design (CAD) tool, such as SPICE. Weekly Lab.

Prerequisite: ECE 222. Corequisite: ECE 321L.

ECE 321L - Electronics I Lab (0)

Lab for Electronics I.

Corequisite: ECE 321.

ECE 322 - Electronics II (4)

Ideal and non-ideal OPAMP circuits; Analysis of electronic amplifiers using small-signal models of electronic devices; Differential and operational amplifier design techniques involving current mirrors and active loads; Frequency response of analog circuits; Computer-aided design. Weekly Lab.

Prerequisite: ECE 223, ECE 321. Corequisite: ECE 322L.

ECE 322L - Electronics II Lab (0)

Lab for Electronics II.

Corequisite: ECE 322.

ECE 323 - Electronics III (4)


Prerequisite: ECE 322. Corequisite: ECE 323L.

ECE 323L - Electronics III Lab (0)

Lab for Electronics III.

Corequisite: ECE 323.

ECE 331 - Engineering Electromagnetics I (4)

Concept of a traveling wave with application to transmission lines; review of vector algebra and calculus in various coordinate systems; Maxwell’s equations for magnetostatics and electrostatics; weekly lab.

Prerequisite: Mth 254, Mth 256, Ph 223 or Ph 213.

ECE 331L - Engineering Electromagnetics I Lab (0)

Lab for Engineering Electromagnetics I.

ECE 331R - Recitation for ECE 331 (0)

Recitation for ECE 331 Engineering Electromagnetics I.

ECE 332 - Engineering Electromagnetics II (4)

Maxwell’s equations for time-varying fields; plane wave propagation and reflection; waveguide structures; radiation and antennas. Topics in wave propagation include scattering, optics, principles of radar, signal integrity and mathematical solution techniques; weekly lab.

Prerequisite: ECE 331. Corequisite: ECE 332L.

ECE 332L - Lab for ECE 332 (0)

Lab for ECE 332 Engineering Electromagnetics II.

Corequisite: ECE 332.

ECE 332R - Recitation for ECE 332 (0)

Recitation for ECE 332 Engineering Electromagnetics II.

ECE 341 - Introduction to Computer Hardware (4)

Presents an overview of computer architecture and programming from a hardware viewpoint. Topics covered in the class include: digital logic—gates, multiplexers, flip-flops, state machines; computer arithmetic operations; basic computer architecture—data path, control, and buses; pipelining—HW and CICS vs. RISC; memory hierarchy and virtual memory; input/output techniques—polling, interrupt, DMA; hardware view of computer system components—keyboard, mouse, displays, printers, disks, modems, and LANs. This course may not be used as part of the degree requirements for an electrical engineering or a computer engineering baccalaureate degree.

Prerequisite: CS 200, CS 201.
ECE 347 - Power Systems I (4)
Prerequisite: ECE 223 or instructor permission. Corequisite: ECE 347L.
ECE 347L - Lab for ECE 347 (0)
Lab for ECE 347.
Corequisite: ECE 347.
ECE 348 - Power Systems II (4)
Prerequisite: ECE 347, or instructor permission.
ECE 348L - Power Systems II Lab (0)
Lab for Power Systems II.
ECE 351 - Hardware Description Languages and Prototyping (4)
Introduces the students to the Verilog Hardware Description Language and describes its role in the electronic design automation environment. Students learn how to prototype digital designs using FPGAs.
Prerequisite: ECE 271.
ECE 371 - Microprocessors (4)
Covers microprocessor instruction set architecture of a 32-bit microprocessor, structured development of assembly language programs, interfacing assembly language and high-level language programs, interrupt procedures, handshake data transfer, and interfacing with simple digital devices and systems. Also included are introductions to microcomputer buses, the memory system design, virtual memory systems, and an overview of microprocessor evolution. Course includes several software and hardware development projects.
Prerequisite: EAS 103 or CS 162, ECE 271.
ECE 372 - Microprocessor Interfacing and Embedded Systems (5)
Teaches the hardware and software design of embedded microprocessor systems. Topics include sensor, transducer, and actuator interfacing; microprocessor-based process control; interfacing with display, vision, and speech systems; Real Time Operating System (RTOS) operation; creation of device drivers; intelligent robotics applications; and an introduction to the Unified Modeling Language (UML); weekly laboratory.
Prerequisite: ECE 371.
ECE 372L - Lab for ECE 372 (0)
Lab for ECE 372 Microprocessor Interfacing and Embedded Systems.
ECE 373 - Embedded Operating Systems & Device Drivers (5)
Extends the microprocessor interfacing skills gained in ECE 372 to the design of hardware and device drivers for a microprocessor system with an embedded operating system. After a brief introduction to the basic structure and operations of the Linux OS, students will gain extensive practice developing Linux device drivers for a wide variety of hardware devices. Course will also include discussions of security and power management techniques commonly used in embedded microprocessors systems.
Prerequisite: ECE 372 or co-requisite CS 333. Corequisite: ECE 373L.
ECE 373L - LAB FOR ECE 373 (0)
Lab for ECE 373.
Corequisite: ECE 373.
ECE 383 - Nanotechnology: Simulation & Design (4)
Introductory circuit simulation; properties of selected nanotechnology devices and systems; nanodevice simulation; development of nanodevice models. May be taken to satisfy the ECE technical writing requirement. This is the same course as SCI 383 and may be taken only once for credit.
Prerequisite: junior standing or permission of the instructor. Crosslisted as: Sci 383U.
ECE 383U - Nanotechnology: Simulation & Design (4)
Introductory circuit simulation; properties of selected nanotechnology devices and systems; nanodevice simulation; development of nanodevice models. May be taken to satisfy the ECE technical writing requirement. This is the same course as SCI 383 and may be taken only once for credit.
Prerequisite: junior standing or permission of the instructor. Crosslisted as: Sci 383U.
ECE 399 - Special Studies (0-8)
(Credit to be arranged.)
ECE 411 - Industry Design Processes (4)
Prepare students for ECE 412 Senior Project Development I and ECE 412 Senior Project Development II classes. Topics covered include: design documentation standards; building and managing effective teams; product development steps; developing and presenting project proposals; the design process; project scheduling and management; intellectual property, non-disclosure agreements, and professional ethics; design for X, design for manufacturing, design for the environment; contemporary issues in engineering; lifelong learning. Class consists of lectures and a small team-based term project.
Prerequisite: senior standing in the University and completion of all junior-level required ECE classes. For non-ECE majors, consent of the instructor.

ECE 412 - Senior Project Development I (4)
In this course, groups of three to five students will apply the structured design methodology learned in ECE 411 or UnSt 421 to original projects with the assistance of faculty and industrial/community advisers. After initial research each student group will prepare a written and oral project proposal. Each student is required to keep a log of his or her individual work and to turn in weekly progress reports. At periodic intervals, each group will give an oral progress report to the entire class.
Prerequisite: ECE 411, ME 491, or UnSt 421 (Industry Design Processes), Wr 227 or Wr 327.

ECE 413 - Senior Project Development II (2)
Continues development of the design projects started in ECE 412 or UnSt 421 to their conclusion. Each student maintains a log of his or her individual work and turns in weekly progress reports. Each group prepares a final written report and delivers a final oral report to the entire class. Note: Non ECE/CpE majors are welcome in this class, but they do not need it to fulfill the University Capstone requirement.

ECE 414 - Microsystem Integration and Packaging (4)
Introduction to integrated circuit packaging and microelectronics system integration; signal integrity; electrical, mechanical, and thermal aspects of microsystem package simulation and design; electronics packaging materials; microsystem reliability and failure mechanisms; current technology developments. Also offered for graduate-level credit as ECE 514 and may be taken only once for credit.
Prerequisite: senior or graduate standing in ECE.

ECE 415 - Fundamentals of Semiconductor Devices (4)
Solid-state electronic devices; operation, fabrication, and applications; single crystal growth, p-n junction, diodes, bipolar junction transistors, MOS capacitor, FETs. Course provides students with a sound understanding of existing devices and gives the necessary background to understand the problems and challenges of the micro-electronic manufacturing. Also offered for graduate-level credit as ECE 515 and may be taken only once for credit.
Prerequisite: Ph 319, ECE 322.

ECE 416 - Integrated Circuit (IC) Technologies (4)
Microelectronic processing of solid-state devices and integrated circuits. A base for understanding more advanced processing and what can and cannot be achieved through IC fabrication. Oxidation, diffusion, and ion implantation will be discussed. Bipolar, CMOS and BiCMOS fabrication processes. DRAM technology. Defining system rules for IC layout. Packaging and yield. New technologies, such as Wafer-Scale Integration and Multi-Chip Modules, will be discussed. Students will be introduced to the concept of designing for manufacturability. Also offered for graduate-level credit as ECE 516 and may be taken only once for credit.
Prerequisite: ECE 415/515.

ECE 417 - Nanoelectronics (4)
Operational principles and circuit applications of nanoelectronic devices: electron tunneling devices, (Esaki and resonant tunnel diodes, single electron transistors, nanodot arrays) carbon nanotubes, nanowires, molecular electronics, and spintronics; nanofabrication techniques. Also offered for graduate-level credit as ECE 517 and may be taken only once for credit.
Prerequisite: ECE 322 and Ph 319.

ECE 418 - Linear System Analysis I (4)
Advanced concepts of continuous-time signals, systems, and transforms. Signals: periodicity, orthogonality, basis functions; system: linearity, super-position, time-invariance, causality, stability, and convolution integral; transforms: Fourier series and Fourier transform, Hilbert and Hartley transform, Laplace transform. Prerequisite: ECE 312.

ECE 419 - Linear System Analysis II (4)
Advanced concepts of discrete-time signals, systems, and transforms. Signals: periodicity, orthogonality, basis functions; system: linearity, super-position, time-invariance, causality, stability, and convolution sum; transforms: Z Transform, discrete Fourier transform and Fast Fourier transform, discrete Hilbert and Hartley transform; State Space description of a system. Also offered for graduate-level credit as ECE 519 and may be taken only once for credit.
Prerequisite: ECE 418/518.

ECE 420 - Analytical Methods for Power Systems (4)
Prerequisite: ECE 347, or instructor permission.

ECE 421 - Analog Integrated Circuit Design I (4)
Modeling of IC devices: transistors, capacitors, resistors. Temperature and device parameter variation effects. Building blocks of analog integrated circuits: current sources and mirrors, gain stages, level shifters, and output stages. Design of supply and temperature independent biasing schemes. CAD tools for circuit design and testing. Also offered for graduate-level credit
as ECE 521 and may be taken only once for credit.

Prerequisite: ECE 323.

ECE 422 - Analog Integrated Circuit Design II (4)

Analysis and design of BJT and MOS operational amplifiers, current-feedback amplifiers, wideband amplifiers and comparators. Frequency response of amplifiers, feedback techniques, analysis and design. Stability and compensation of amplifiers, high slew-rate topologies. Noise in IC circuits. Fully differential circuits, analog multipliers and modulators. CAD tools for circuit design and testing. Also offered for graduate-level credit as ECE 522 and may be taken only once for credit.

Prerequisite: ECE 421/521.

ECE 425 - Digital Integrated Circuit Design I (4)

Students in electrical and computer engineering are introduced to the analysis and design of digital integrated circuits. A design project is an integral part of this course. Also offered for graduate-level credit as ECE 525 and may be taken only once for credit.

Prerequisite: ECE 321, Stat 451.

ECE 426 - Digital Integrated Circuit Design II (4)

Students are instructed in methods and the use of computer-aided design tools for the design and testing of large-scale integrated digital circuits. A design project is an integral part of this course. Also offered for graduate-level credit as ECE 526 and may be taken only once for credit.

Prerequisite: ECE 425/525.

ECE 428 - VLSI Computer-Aided Design (4)

Introduces basic techniques and algorithms for computer-aided design and optimization of VLSI circuits. The first part discusses VLSI design process flow for custom, ASIC and FPGA design styles and gives an overview of VLSI fabrication with emphasis on interconnections. The necessary background in graph theory and mathematical optimization is introduced. In the second part, application of different analytical and heuristic techniques to physical design (partitioning, placement, floorplanning and routing) of VLSI circuits is studied. We shall emphasize VLSI design issues encountered in deep submicron technology. Throughout the course students will be exposed to research methodology and to a set of academic and commercial CAD tools for physical design. Also offered for graduate-level credit as ECE 528 and may be taken only once for credit.

Prerequisite: senior or graduate standing.

ECE 431 - Microwave Circuit Design I (4)

Passive microwave components. Design of microstrip circuits. Active high frequency devices. Microwave computer aided design. Also offered for graduate-level credit as ECE 531 and may be taken only once for credit.

Prerequisite: ECE 332. Corequisite: ECE 431L.

ECE 431L - Microwave Circuit Design I Lab (0)

Lab for Engineering Electromagnetics I.

Corequisite: ECE 431.

ECE 432 - Microwave Circuit Design II (4)

Small-signal amplifier design for gain and noise. Non-linear effects and nonlinear circuit design. Oscillator design. Introduction to MMIC design. Design project is an integral part of this course. Also offered for graduate-level credit as ECE 532 and may be taken only once for credit.

Prerequisite: ECE 431/531. Corequisite: ECE 432L.

ECE 432L - Microwave Circuit Design II Lab (0)

Lab for Microwave Circuit Design II.

Corequisite: ECE 432.

ECE 435 - Radar and Sonar Processing (4)

Introduction to radar and sonar processing including detection and estimation theory, array processing, and signal propagation models. Course will concentrate on physics-based processing techniques applied to real systems with application to remote sensing, underwater sonar and medical imaging. Pulsed systems and spectroscopy may also be covered in the context of terahertz sensing. Coursework will involve readings from current scientific journals and MATLAB data processing. Also offered for graduate-level credit as ECE 535 and may be taken only once for credit.

Prerequisite: ECE 331, ECE 332.

ECE 436 - Applications in Electromagnetics, Optic, and Acoustics (4)

Introduction applications of electromagnetics (EM), optics, and acoustics in engineering fields. Specific topics will change, but may include (EM): antenna design, electromagnetic interference, microwave and terahertz sensing, waveguide design, and wireless communications; (optics) lasers and LEDs, holography, diffraction and scattering; (acoustics) commercial audio, underwater acoustics, medical ultrasound, and active noise control. Course content will consist of project-based laboratory activities and reading assignments from current publications. Also offered for graduate-level credit as ECE 536 and may be taken only once for credit.

Prerequisite: ECE 331, ECE 332.

ECE 445 - Power Electronic Systems Design I (4)

Basic DC-to-DC switching converter topologies are presented. Operation in various modes is examined. Steady state design is undertaken using state space techniques and equivalent circuit modeling. Design issues concerning semiconductor devices and magnets design are also addressed. Also offered for graduate-level credit as ECE 545 and may be taken only once for credit.

Prerequisite: ECE 322.

ECE 446 - Power Electronic Systems Design II (4)

Dynamic analysis of DC-to-DC converters is presented using state space techniques and the method of equivalent circuit modeling of the switching device. Different control techniques such as current programming and sliding mode control are introduced. Inverter and input current wave shaping rectifier circuits are also introduced. Also offered for graduate-level credit as ECE 546 and may be taken only once for credit.

Prerequisite: ECE 445/545.

ECE 448 - Power System Protection (4)

Relaying concepts, per unit calculations symmetrical components, phasors, polarity and direction sensing, current/voltage transformers, protection fundamentals basic design principles, system grounding principles, device protection, directional comparison, blocking blocking pilot
ECE 451 - Control Systems Design I (4)
State space description of linear systems. Controllability and observability. State feedback used in controller and observer design by pole placement. Optimal control, linear quadratic regulator, linear quadratic estimator (Kalman filter), linear quadratic Gaussian, and linear quadratic Gaussian with loop transfer recovery design procedures. Also offered for graduate-level credit as ECE 551 and may be taken only once for credit.
Prerequisite: ECE 311, Mth 261 or Mth 343.

ECE 452 - Control Systems Design II (4)
Discrete-time control systems, Z transforms, difference equations, pulse transfer function, sampling, data hold, block diagram reduction. Jury stability test. Various approaches to classical control design of discrete time controllers. State space analysis and design in discrete-time. Also offered for graduate-level credit as ECE 552 and may be taken only once for credit.
Prerequisite: ECE 451/551.

ECE 455 - AI: Neural Networks I (4)
Introduces approach for developing computing devices whose design is based on models taken from neurobiology and on notion of "learning." A variety of NN architectures and associated computational algorithms for accomplishing the learning are studied. Experiments with various of the available architectures are performed via a simulation package. Students do a major project on the simulator, or a special programming project. Also offered for graduate-level credit as ECE 555 and may be taken only once for credit.
Prerequisite: ECE 448/548, or instructor permission.

ECE 456 - AI: Neural Networks II (4)
Focuses on applications. Topics in fuzzy set theory, control theory, and pattern recognition are studied and incorporated in considering neural networks. A design project (using NN simulator) in selected application area is done by each student. Also offered for graduate-level credit as ECE 556 and may be taken only once for credit.
Prerequisite: ECE 455/555.

ECE 457 - Engineering Data Analysis and Modeling (4)
Introduces statistical learning theory and practical methods of extracting information from data. Covers time-proven methods of statistical hypothesis testing, linear modeling, univariate smoothing, density estimation, nonlinear modeling, and multivariate optimization. Student project presentations and reports familiarize students with research methodology and professional journal standards. Also offered for graduate-level credit as ECE 557 and may be taken only once for credit.
Prerequisite: Mth 343 and Stat 451.

ECE 461 - Communication Systems Design I (4)
An introduction to signals and noise in electrical communication systems; signal spectra and filters, noise and random signals, base band transmission of analog and digital signals, linear modulation and exponential modulation. Also offered for graduate-level credit as ECE 561 and may be taken only once for credit.
Prerequisite: ECE 223.

ECE 465 - Digital Signal Processing (4)
Intended to teach students the skills to design a complete DSP-based electronic system. Students will have a design project using embedded DSP hardware and software. Topics include: digital processing of analog signals, A/D converters, D/A converters, digital spectral analysis, digital filter design, signal processing applications and multirate signal processing.
Prerequisite: ECE 223.

ECE 478 - Intelligent Robotics I (4)
Basic problems of intelligent robotics. Introduction to problems of hardware for Artificial Intelligence and Robotics. Formulation and reduction of problems. Tree search. Predicate calculus and resolution method. Methods of formulating and solving problems in logic programming. Fuzzy logic. Logic programming and artificial intelligence in robot systems. Reasoning by analogy and induction. Associative processors. Also offered for graduate-level credit as ECE 578 and may be taken only once for credit.
Prerequisite: ECE 372.

ECE 479 - Intelligent Robotics II (4)
Prerequisite: ECE 372.
credit as ECE 579 and may be taken only once for credit.

Prerequisite: ECE 478/578.

ECE 481 - ASIC: Modeling and Synthesis (4)
Covers the fundamentals of the ASIC design process. The topics include ASIC design Flow, basic HDL constructs, test benches, modeling combinational and synchronous logic, modeling finite state machines, multiple clock domain designs, qualitative design issues, ASIC constructions. Also offered for graduate-level credit as ECE 581 and may be taken only once for credit.

Prerequisite: ECE 371.

ECE 483 - Low Power Digital IC Design (4)
Introduction to the existing techniques for IC power modeling, optimization, and synthesis. Topics include: sources of power dissipation, design for low power, voltage scaling approaches, power analysis techniques, power optimization techniques, low-power system-level designs. Focus on abstraction, modeling, and optimization at all levels of design hierarchy, including the technology, circuit, layout, logic, architectural, and algorithmic levels. Also offered for graduate-level credit as ECE 583 and may be taken only once for credit.

Prerequisite: ECE 425/525.

ECE 485 - Microprocessor System Design (4)
Advanced hardware and software design of desktop type microcomputer systems. Topics include large project design management and documentation; DRAM system design, cache organization, connections, and coherency; the memory hierarchy and virtual memory; I/O buses such as AGP, PCI-X, and Infiniband; multithreaded operating system considerations; JTAG(IEEE1149.1) and Design For Test; high frequency signal integrity; and power supply considerations. Team-based, independent design projects are a substantial part of the homework for this class. Also offered for graduate-level credit as ECE 585 and may be taken only once for credit.

Prerequisite: ECE 372.

ECE 486 - Computer Architecture (4)
An introduction to the key concepts of computer system architecture and design. Topics include the design and analysis of instruction set architectures, memory systems, and high-performance IO systems; basic CPU implementation strategies; basic pipelined CPU implementation; performance analysis; and a survey of current architectures. Also offered for graduate-level credit as ECE 586 and may be taken only once for credit.

Prerequisite: ECE 485/585.

ECE 488L - Lab for ECE 488 (0)
Lab for ECE 488.

ECE 491 - Laser Systems Design I (4)
Laser topics: especially design of laser, fiber optic, and related optical systems. Formation and propagation of modes and beams, matrix methods for the analysis and synthesis of optical systems. Also offered for graduate-level credit as ECE 591 and may be taken only once for credit.

Prerequisite: ECE 331.

ECE 492 - Laser Systems Design II (4)
Interaction of light with atoms, Maxwell Schrodinger analysis and rate equation approximations. Effects of gain, dispersion, and saturation in the design of laser amplifiers and oscillators. Also offered for graduate-level credit as ECE 592 and may be taken only once for credit. Expected preparation: ECE 331.

ECE 501 - Research (1-12)
(Credit to be arranged.) Consent of instructor.

ECE 502 - Independent Study (1-12)
(Credit to be arranged.)

ECE 503 - Thesis (1-12)
(Credit to be arranged.) Consent of instructor.

ECE 504 - Cooperative Education/Internship (1-12)
(Credit to be arranged.) Consent of instructor.

ECE 505 - Reading and Conference (1-6)
(Credit to be arranged.) Consent of instructor.

ECE 506 - Special Projects (1-9)
(Credit to be arranged.) Consent of instructor.

Prerequisite: ECE 323.
ECE 514 - Microsystem Integration and Packaging (4)
Introduction to integrated circuit packaging and microelectronics system integration; signal integrity; electrical, mechanical, and thermal aspects of microsystem package simulation and design; electronics packaging materials; microsystem reliability and failure mechanisms; current technology developments. Also offered for undergraduate-level credit as ECE 414 and may be taken only once for credit.
Prerequisite: senior or graduate standing in ECE.

ECE 515 - Fundamentals of Semiconductor Devices (4)
Solid-state electronic devices; operation, fabrication and applications; single crystal growth, p-n junction, diodes, bipolar junction transistors, MOS capacitor, FETs. Course provides students with a sound understanding of existing devices and gives the necessary background to understand the problems and challenges of the micro-electronic manufacturing. Also offered for undergraduate-level credit as ECE 415 and may be taken only once for credit.
Prerequisite: Ph 319, ECE 322.

ECE 516 - Integrated Circuit (IC) Technologies (4)
Microelectronic processing of solid-state devices and integrated circuits. A base for understanding more advanced processing and what can and cannot be achieved through IC fabrication. Oxidation, diffusion, and ion implantation will be discussed. Bipolar, CMOS and BiCMOS fabrication processes. DRAM technology. Defining system rules for IC layout. Packaging and yield. New technologies, such as Wafer-Scale Integration and Multi-Chip Modules, will be discussed. Students will be introduced to the concept of designing for manufacturability. Also offered for undergraduate-level credit as ECE 416 and may be taken only once for credit.
Prerequisite: ECE 415/515.

ECE 517 - Nanoelectronics (4)
Operational principles and circuit applications of nanoelectronic devices: electron tunneling devices, (Esaki and resonant tunnel diodes, single electron transistors, nanodot arrays) carbon nanotubes, nanowires, molecular electronics, and spintronics; nano-fabrication techniques. Also offered for undergraduate-level credit as ECE 417 and may be taken only once for credit.
Prerequisite: ECE 322 and Ph 319.

ECE 518 - Linear System Analysis I (4)
Prerequisite: ECE 312.

ECE 519 - Linear System Analysis II (4)
Advanced concepts of discrete-time signals, systems, and transforms. Signals: periodicity, orthogonality, basis functions; system: linearity, super-position, time-invariance, causality, stability, and convolution sum; transforms: Z Transform, discrete Fourier transform and Fast Fourier transform, discrete Hilbert and Hartley transform; State Space description of a system. Also offered for undergraduate-level credit as ECE 419 and may be taken only once for credit.
Prerequisite: ECE 418/518.

ECE 520 - Analytical Methods for Power Systems (4)
Prerequisite: ECE 347, or instructor permission.

ECE 521 - Analog Integrated Circuit Design I (4)
Modeling of IC devices: transistors, capacitors, resistors. Temperature and device parameter variation effects. Building blocks of analog integrated circuits: current sources and mirrors, gain stages, level shifters, and output stages. Design of supply and temperature independent biasing schemes. CAD tools for circuit design and testing. Also offered for undergraduate-level credit as ECE 421 and may be taken only once for credit.
Prerequisite: ECE 323.

ECE 522 - Analog Integrated Circuit Design II (4)
Analysis and design of BJT and MOS operational amplifiers, current-feedback amplifiers, wideband amplifiers and comparators. Frequency response of amplifiers. Feedback techniques, analysis and design. Stability and compensation of amplifiers, high slew-rate topologies. Noise in IC circuits. Fully differential circuits, analog multipliers and modulators. CAD tools for circuit design and testing. Also offered for undergraduate-level credit as ECE 422 and may be taken only once for credit.
Prerequisite: ECE 421/521.

ECE 523 - Analog Integrated Circuit Design III (4)
Integrated-circuit oscillators and timers, frequency-to-voltage converters, phase-locked-loop circuits, IC filters, self-tuning filters, digital-to-analog converters, analog-to-digital converters, CAD tools for circuit design and testing.
Prerequisite: ECE 422/522.

ECE 524 - Advanced Embedded In Silico and In Materio Computing (4)
Introduces and develops the advanced hardware and software concepts, design methodologies, and programming paradigms of emerging embedded in silico and in materio computing systems. Topics covered: physics of computation, spatial computing paradigms, self-assembly and self-organization, morphogenetic systems, molecular and nano-scale computing, non-classical computing and non-classical programming paradigms, amorphous computing. Also offered as ECE 624 and may be taken only once for credit.
Prerequisite: ECE 371 or permission of the instructor.
ECE 525 - Digital Integrated Circuit Design I (4)

Students in electrical and computer engineering are introduced to the analysis and design of digital integrated circuits. A design project is an integral part of this course. Also offered for undergraduate-level credit as ECE 425 and may be taken only once for credit.

Prerequisite: ECE 321, Stat 451.

ECE 526 - Digital Integrated Circuit Design II (4)

Students are instructed in methods and the use of computer-aided design tools for the design and testing of large-scale integrated digital circuits. A design project is an integral part of this course. Also offered for undergraduate-level credit as ECE 426 and may be taken only once for credit.

Prerequisite: ECE 425/525.

ECE 527 - High-performance Digital Systems (4)

The use of computer-aided design tools in high performance digital systems is explored. The trade-offs between automated and hand design are examined in the context of performance vs. development time. The impact of new developments in MOS circuit technology are also examined. Also offered as ECE 627 and may be taken only once for credit.

Prerequisite: ECE 426/526.

ECE 528 - VLSI Computer-Aided Design (4)

Introduces basic techniques and algorithms for computer-aided design and optimization of VLSI circuits. The first part discusses VLSI design process flow for custom, ASIC and FPGA design styles and gives an overview of VLSI fabrication with emphasis on interconnections. The necessary background in graph theory and mathematical optimization is introduced. In the second part, application of different analytical and heuristic techniques to physical design (partitioning, placement, floorplanning and routing) of VLSI circuits is studied. We shall emphasize VLSI design issues encountered in deep submicron technology. Throughout the course students will be exposed to research methodology and to a set of academic and commercial CAD tools for physical design. Also offered for undergraduate-level credit as ECE 428 and may be taken only once for credit.

Prerequisite: senior or graduate standing.

ECE 529 - CAD for ULSI and Emerging Technologies (4)

Course will cover Computer-Aided Design (CAD) challenges for ultra submicron CMOS system design and circuit and system design in new emerging technologies. It will cover (1) system design approaches and optimization techniques in the presence of process and environmental parameter variations (2) statistical approaches to circuit and system design, (3) physical design (layout) role in performance evaluation of digital systems, and (4) design and architecture outlook for beyond CMOS Switches. Also offered as ECE 629 and may be taken only once for credit.

Prerequisite: ECE 428/528 or consent of instructor.

ECE 531 - Microwave Circuit Design I (4)

Passive microwave components. Design of microstrip circuits. Active high frequency devices. Microwave computer aided design. Also offered for undergraduate-level credit as ECE 431 and may be taken only once for credit.

Prerequisite: ECE 332. Corequisite: ECE 531L.

ECE 531L - Microwave Circuit Design I Lab (0)

Lab for Microwave Circuit Design I.

Corequisite: ECE 531.

ECE 532 - Microwave Circuit Design II (4)

Small-signal amplifier design for gain and noise. Non-linear effects and nonlinear circuit design. Oscillator design. Introduction to MMIC design. Design project is an integral part of this course. Also offered for undergraduate-level credit as ECE 432 and may be taken only once for credit.

Prerequisite: ECE 431/531. Corequisite: ECE 532L.

ECE 532L - Microwave Circuit Design II Lab (0)

Lab for Microwave Circuit Design II.

Corequisite: ECE 532.

ECE 533 - Advanced Electromagnetics (4)

Advanced course in electromagnetics. Mathematical methods, electrostatics, boundary value problems, magnetostatics, time varying fields, plane waves. Also offered as ECE 633 and may be taken only once for credit.

Prerequisite: ECE 331.

ECE 534 - Acoustics (4)

Fundamentals of linear acoustics: acoustic wave equations, scattering theory and acoustic propagation. Numerical techniques. Applications emphasizing underwater acoustics and medical ultrasound. Also offered as ECE 634 and may be taken only once for credit.

Prerequisite: graduate standing.

ECE 535 - Radar and Sonar Processing (4)

Introduction to radar and sonar processing including detection and estimation theory, array processing, and signal propagation models. Course will concentrate on physics-based processing techniques applied to real systems with application to remote sensing, underwater sonar and medical imaging. Pulsed systems and spectroscopy may also be covered in the context of terahertz sensing. Coursework will involve readings from current scientific journals and MATLAB data processing. Also offered for undergraduate-level credit as ECE 435 and may be taken only once for credit.

Prerequisite: ECE 331, ECE 332.

ECE 536 - Applications in Electromagnetics, Optic, and Acoustics (4)

Introduction applications of electromagnetics (EM), optics, and acoustics in engineering fields. Specific topics will change, but may include (EM): antenna design, electromagnetic interference, microwave and terahertz sensing, waveguide design, and wireless communications; (optics) lasers and LEDs, holography, diffraction and scattering; (acoustics) commercial audio, underwater acoustics, medical ultrasound, and active noise control. Course content will consist of project-based laboratory activities and reading assignments from current publications. Also offered for undergraduate-level credit as ECE 436 and may be taken only once for credit.
ECE 537 - Advanced Topics in Power Systems (4)
In-depth exploration of a challenging contemporary topic within power systems. Each offering of this course focuses on specific topic; this is not a survey course.
Prerequisite: ECE 331, ECE 332.

ECE 538 - Statistical Signal Processing I: Nonparametric Estimation (4)
Unified introduction to the theory, implementation, and applications of statistical signal processing methods. Focus on estimation theory, random signal modeling, characterization of stochastic signals and systems, and nonparametric estimation. Designed to give a solid foundation in the underlying theory balanced with a discussion of the practical advantages and limitations of nonparametric estimation methods. Also offered as ECE 638 and may be taken only once for credit.
Prerequisite: Mth 261 and ECE 565/665. Should have some proficiency at programming in MATLAB.

ECE 539 - Statistical Signal Processing II: Linear Estimation (4)
Unified introduction to the theory, implementation, and application of statistical signal processing methods. Focus on optimum linear filters, least square filters, the Kalman filter, signal modeling, and parametric spectral estimation. Designed to give a solid foundation in the underlying theory balanced with examples of practical applications and limitations. Recommended: ECE 538/638. ECE 541 Transmission Operation and Control, (4) introduces the following topics: state estimation, security analysis, contingency monitoring, optimal power flow, reliability, interchange of energy, market and pool operation. Also offered as ECE 639 and may be taken only once for credit.
Prerequisite: ECE 441, ECE 442, or consent of instructor.

ECE 540 - System-on-Chip Design with FPGAs (4)
Tools and techniques for designing, verifying and implementing System-on-Chip (SoC) designs using an FPGA development board. Along with class work, students take several projects from concept through synthesis and debug using key techniques for optimizing a design. Expected preparation: ECE 351 Hardware Description Languages and Prototyping or equivalent.
Prerequisite: Graduate standing. Student must be familiar with Verilog HDL or VHDL. Knowledge of a computer programming language such as C or Assembly Language is helpful but not required.

ECE 541 - Power Operations Fundamentals I (4)
Power system operations theory and practice; fundamental concepts and applications. Balancing authority operations concepts concerning regulation and applied regulatory constraints, power operations trading markets, smart-grid systems, transmission and generation components, and cyber security.
Prerequisite: ECE 347 or instructor permission. State estimation, security analysis, contingency monitoring, optimal power flow, reliability, interchange of energy, markets and pool operation. Prerequisites: ECE 348, or instructor permission.

ECE 542 - Power Operations Fundamentals II (4)
Power system operations theory and practice; advanced concepts and applications. Emphasis on understanding the electric industry as a complex system; operations concepts for balancing authority utilities; regulatory constraints, interoperability and impacts on operations; project management of smart-grid systems; design of programmatic, distribution and utility-scale renewable components; utility cyber security.
Prerequisite: ECE 541, or instructor permission. Power generation unit characteristics, economic dispatch, unit commitment, flow constraints and limited energy supply, automatic generation control, production cost models, interchange of power and energy, extended auction mechanisms and reliability. Prerequisites: ECE 348, or instructor permission.

ECE 543 - Power Systems Control (4)
State estimation, security and contingency monitoring, automatic generation control, economic dispatch, optimal power flow, power system stability, unit commitment and pool operation.
Prerequisite: ECE 448/548, or instructor permission.

ECE 544 - Embedded System Design with FPGAs (4)
Students take several embedded system projects from concept through debug on an FPGA development board while learning how to design and implement integrated hardware/software applications that interact with "real world" devices. Xilinx software tools and the GNU tool chain are used. Programming is done in C/C++.
Prerequisite: ECE 540 or consent of instructor.

ECE 545 - Power Electronic Systems Design I (4)
Basic DC-to-DC switching converter topologies are presented. Operation in various modes is examined. Steady state design is undertaken using state space techniques and equivalent circuit modeling. Design issues concerning semiconductor devices and magnetics design are also addressed. Also offered for undergraduate-level credit as ECE 445 and may be taken only once for credit.
Prerequisite: ECE 322.

ECE 546 - Power Electronic Systems Design II (4)
Dynamic analysis of DC-to-DC converters is presented using state space techniques and the method of equivalent circuit modeling of the switching device. Different control techniques such as current programming and sliding mode control are introduced. Inverter and input current wave shaping rectifier circuits are also introduced. Also offered for undergraduate-level credit as ECE 446 and may be taken only once for credit.
Prerequisite: ECE 445/545.

ECE 547 - Energy Economics (4)
Electric power operation and information systems, optimization methods, information technologies, short-term electricity markets and locational marginal prices, risk management and financial derivatives, basics of public-good economics, optimization methods.
Prerequisite: ECE 347, or instructor permission.

**ECE 548 - Power System Protection (4)**
Relaying concepts, per unit calculations symmetrical components, phasors, polarity and direction sensing, current/voltage transformers, protection fundamentals basic design principles, system grounding principles, device protection, directional comparison, blocking, blocking pilot protection, line differential, phase comparison pilot protection, out of step tripping and blocking. Weekly Lab. Also offered for undergraduate-level credit as ECE 448 and may be taken only once for credit.

Prerequisite: ECE 420/520, or instructor permission. Corequisite: ECE 548L.

**ECE 548L - Power System Protection Lab (0)**
Lab for Power System Protection.

Corequisite: ECE 548.

**ECE 549 - Power Systems Design (4)**
Design fundamentals as applied to power systems. Electrical design: electrical equipment, insulation, protection, grounding. Mechanical design: clearances, siting, support structures. Right-of-way. Asset management. Commissioning. Applicable codes and standards. Course topics will be taught by focusing on a particular subset of power systems such as transmission, distribution, substations or generation. Also offered for undergraduate-level credit as ECE 449 and may be taken only once for credit.

Prerequisite: ECE 448/548, or instructor permission.

**ECE 550 - Power System Stability (4)**

Prerequisite: ECE 448 or ECE 548 or instructor permission.

**ECE 551 - Control Systems Design I (4)**
State space description of linear systems. Controllability and observability. State feedback used in controller and observer design by pole placement. Optimal control, linear quadratic regulator, linear quadratic estimator (Kalman filter), linear quadratic Gaussian, and linear quadratic Gaussian with loop transfer recovery design procedures. Also offered for undergraduate-level credit as ECE 451 and may be taken only once for credit.

Prerequisite: ECE 311, Mth 261 or Mth 343.

**ECE 552 - Control Systems Design II (4)**
Discrete-time control systems, z transforms, difference equations, pulse transfer function, sampling, data hold, block diagram reduction. Jury stability test. Various approaches to classical control design of discrete-time controllers. State space analysis and design in discrete-time. Also offered for undergraduate-level credit as ECE 452 and may be taken only once for credit.

Prerequisite: ECE 451/551.

**ECE 553 - Control Systems Design III (4)**
Topics in modern feedback control theory of nonlinear and multivariable systems, including considerations of stochastic and optimal control. Design methods of computer workstations.

Prerequisite: ECE 452/552.

**ECE 555 - AI: Neural Networks I (4)**
Introduces approach for developing computing devices whose design is based on models taken from neurobiology and on notion of "learning." A variety of NN architectures and associated computational algorithms for accomplishing the learning are studied. Experiments with various of the available architectures are performed via a simulation package. Students do a major project on the simulator, or a special programming project. Also offered for undergraduate-level credit as ECE 455 and may be taken only once for credit.

Prerequisite: senior standing in ECE/CPE or CS, or graduate standing.

**ECE 556 - AI: Neural Networks II (4)**
Focuses on applications. Topics in fuzzy set theory, control theory, and pattern recognition are studied and incorporated in considering neural networks. A design project (using NN simulator) in selected application area is done by each student. Also offered for undergraduate-level credit as ECE 456 and may be taken only once for credit.

Prerequisite: ECE 455/555.

**ECE 557 - Engineering Data Analysis and Modeling (4)**
Introduces statistical learning theory and practical methods of extracting information from data. Covers time-proven methods of statistical hypothesis testing, linear modeling, univariate smoothing, density estimation, nonlinear modeling, and multivariate optimization. Student project presentations and reports familiarize students with research methodology and professional journal standards. Also offered for undergraduate-level credit as ECE 457 and may be taken only once for credit.

Prerequisite: Mth 343 and Stat 451.

**ECE 558 - Embedded Systems Programming (4)**
Equips students with the skills required to program modern embedded systems. Topics include object oriented and event-based programming, multi-tasking, advanced sensors, databases, location-based services, and networking. Heavily project-oriented, allowing students to acquire hands-on experiences based on the foundational material taught in the lectures.

Prerequisite: ECE 485 or ECE 585. Expected preparation: CS 202 and/or experience with Object-Oriented programming and Java.

**ECE 559 - Genetic Algorithms (4)**
Theory and applications of genetic algorithms. Study of the Schema and No Free Lunch theorems. Techniques for using genetic algorithms to solve multi-objective and NP-hard optimization problems from physical science, natural science, engineering and mathematical fields. Investigation of game theory problems, evolvable hardware problems, and constrained parameter optimization problems. Survey of current technical literature in evolutionary computation.

Prerequisite: CS 163 or equivalent.
ECE 561 - Communication Systems Design I (4)
An introduction to signals and noise in electrical communication systems; signal spectra and filters, noise and random signals, base band transmission of analog and digital signals, linear modulation and exponential modulation. Also offered for undergraduate-level credit as ECE 461 and may be taken only once for credit.
Prerequisite: ECE 223.

ECE 562 - Communication Systems Design II (4)
Study of the relative merits of communication systems, noise in continuous wave and pulse modulation schemes, information theory, digital data systems, and advanced topics. Also offered for undergraduate-level credit as ECE 462 and may be taken only once for credit.
Prerequisite: ECE 461/561.

ECE 565 - Signals and Noise (4)
Students are introduced to "noise" as it appears in communication and control systems, its mathematical and statistical properties and practical filtering methods to minimize its impact on systems. Advanced topics in filter and estimation theory are also introduced.
Prerequisite: graduate standing in electrical engineering. Also offered as ECE 665 and may be taken only once for credit.
Prerequisite: ECE 223.

ECE 566 - Digital Signal Processing (4)
Study of discrete time signals and systems. Mathematics of discrete time systems in time and frequency domains. Discrete Fourier Transform, FFT algorithms and applications, digital filter design, random signals in digital linear systems form the foundations of this course. Also offered as ECE 666 and may be taken only once for credit.
Prerequisite: ECE 565/665.

ECE 567 - Introduction to System Verilog for Design and Verification (4)
Introduction to SystemVerilog: language features to support both design and verification. Good practices for simulation and synthesis, techniques for constructing reusable testbenches. Additional topics may include hardware acceleration and transaction-based verification techniques. Course includes homework and significant final project with presentation. Familiarity with Verilog and finite state machines required.
Prerequisite: ECE 351 or equivalent, or permission of instructor.

ECE 569 - Advanced Image Processing (4)
Two-dimensional systems, image perception, image digitization (sampling and quantization), image transforms (Fourier, Cosine, K-L transforms), image enhancement (histogram equalization, filtering, spatial operation). Also offered as ECE 668 and may be taken only once for credit.
Prerequisite: ECE 223.

ECE 570 - Computer Vision (4)
Image detection and registration, image analysis (texture extraction, edge detection, segmentation), image reconstruction (radon transform, Fourier reconstruction), stereo imaging and motion analysis, pattern recognition (recognition, classification and clustering).
Prerequisite: ECE 568/668.

ECE 571 - Statistical Communications Theory (4)
As an advanced course in communication theory, topics of statistical decision, estimation, and modulation theory are introduced. Statistical aspects of transmission detection and error detection/correction schemes are covered. Also offered as ECE 667 and may be taken only once for credit.
Prerequisite: ECE 461/561, 565/665.

ECE 572 - Advanced Logic Synthesis (4)
Introduction to relaxation and synthesis, design problems and synthesis, techniques for constructing reusable testbenches. Additional topics may include hardware acceleration and transaction-based verification techniques. Course includes homework and significant final project with presentation. Familiarity with Verilog and finite state machines required.
Prerequisite: ECE 271.

ECE 573 - Control Unit Design (4)
Prerequisite: ECE 572/672.

ECE 574 - High-level Synthesis and Design Automation (4)
Comprehensive design automation systems. Problems of system and high-level synthesis. Register-transfer and hardware description languages. Data path design: scheduling and allocation. Design methods for systolic, pipelined, cellular and dynamic architectures. System issues. System-level silicon compilers. Group project: using high-level tools for design of a complete VLSI ASIC chip or FPGA architecture: vision, DSP, or controller. Also offered as ECE 674 and may be taken only once for credit.
Prerequisite: ECE 573/673.

ECE 575 - Introduction to Integrated Circuit Test (4)
Course will cover the traditional role of IC test in parametric and functional testing and the changing role of IC testing in
ECE 576 - Computational Methods in Electrical Engineering (4)

Students are introduced to advanced mathematical techniques applicable to electrical engineering. Content includes topics such as: optimization techniques, solution of partial differential equations, solution of eigenvalue problems, Fourier methods, vector space operations, and complex variable theory. Additional mathematical topics will be introduced as application examples at the discretion of the instructor. Also offered as ECE 675 and may be taken only once for credit.

Prerequisite: graduate standing.

ECE 577 - Interactive Computer Graphics (4)

An introduction to the principles of interactive computer graphics including logical devices, physical devices, transformation, viewing and clipping in two and three dimensions.

Prerequisite: ECE 575/675.

ECE 578 - Intelligent Robotics I (4)

Basic problems of intelligent robotics. Hardware for Artificial Intelligence and Robotics. Formulation and reduction of problems. Tree search. Predicate calculus and resolution method. Methods of formulating and solving problems in logic programming. Fuzzy Logic. Logic programming and artificial intelligence in robot systems. Reasoning by analogy and induction. Associative processors. Also offered for undergraduate-level credit as ECE 478 and may be taken only once for credit.

Prerequisite: ECE 372.

ECE 579 - Intelligent Robotics II (4)

Sensors. Computer vision hardware. Problems in image processing, vision, manipulation, and planning. Machines for image processing and computer vision.

ECE 580 - Advanced Power Systems Protection (4)

The second course protection for students who have taken a previous class or have substantial experience in protective relaying. Emphasis: analysis of principles and application of microprocessor-based relays (digital relays) to protection of high-voltage transmission lines, power transformers, power generators, high-voltage substation equipment; wide-area approach to power systems protection.

Prerequisite: ECE 448/548, or instructor approval.

ECE 581 - ASIC: Modeling and Synthesis (4)

Covers the fundamentals of the ASIC design process. The topics include ASIC design Flow, basic HDL constructs, test benches, modeling combinational and synchronous logic, modeling finite state machines, multiple clock domain designs, qualitative design issues, ASIC constructions. Also offered for undergraduate-level credit as ECE 481 and may be taken only once for credit.

Prerequisite: ECE 371.

ECE 582 - Formal Verification of Hardware/Software Systems (4)

Objective is to introduce the main formal verification methods of hardware/software systems. Topics to be covered include: formal logics for system verification (first-order logic, higher order logic, temporal logic), formal specifications, theorem proving systems, microprocessor system verification, and system software verification. Also offered as ECE 682 and may be taken only once for credit.

Prerequisite: ECE 371, or CS 321, CS 333.

ECE 583 - Low Power Digital IC Design (4)

Introduction to the existing techniques for IC power modeling, optimization, and synthesis. Topics include: sources of power dissipation, design for low power, voltage scaling approaches, power analysis techniques, power optimization techniques, low-power system-level designs. Focus on abstraction, modeling, and optimization at all levels of design hierarchy, including the technology, circuit, layout, logic, architectural, and algorithmic levels. Also offered for undergraduate-level credit as ECE 483 and may be taken only once for credit.

Prerequisite: ECE 425/525.

ECE 585 - Microprocessor System Design (4)

Advanced hardware and software design of desktop type microcomputer systems. Topics include large project design management and documentation; DRAM system design, cache organization, connections, and coherency; the memory hierarchy and virtual memory; I/O buses such as AGP, PCI-X, and Infiniband; multithreaded operating system considerations; JTAG(IEEE1149.1) and Design For Test; high frequency signal integrity; and power supply considerations. Team-based, independent design projects are a substantial part of the homework for this class. Also offered for undergraduate-level credit as ECE 485 and may be taken only once for credit.

Prerequisite: ECE 372.

ECE 586 - Computer Architecture (4)

An introduction to the key concepts of computer system architecture and design. Topics include the design and analysis of instruction set architectures, memory systems, and high-performance IO systems; basic CPU implementation strategies; basic pipelined CPU implementation; performance analysis; and a survey of current architectures. Also offered for undergraduate-level credit as ECE 486 and may be taken only once for credit.

Prerequisite: ECE 485/585.

ECE 587 - Advanced Computer Architecture I (4)

An advanced course in computer system architecture and design. Key topics include advanced CPU implementation techniques
including pipelining, dynamic instruction issue, superscalar architectures, and vector processing; high performance memory and IO systems design; an introduction to parallel computers; and a survey of current literature in computer architecture and of current advanced computer systems. Students will begin a project that will be completed in ECE 588/688. Also offered as ECE 687 and may be taken only once for credit.

Prerequisite: 486/586.

ECE 588 - Advanced Computer Architecture II (4)
Discussion of parallel computer architectures and their uses. Key topics include MIMD architectures; associative processing; shared-memory and message-passing architectures; dataflow and reduction architectures; special-purpose processors; design and analysis of interconnection networks; and an overview of parallel software issues. Students will complete the project started in ECE 587/687. Also offered as ECE 688 and may be taken only once for credit.

Prerequisite: ECE 587/687.

ECE 589 - Performance Analysis of Local Area Networks (4)

ECE 590 - Digital Design Using Hardware Description Languages (4)
An introductory graduate class to digital design using hardware description languages and to advanced digital design for programmable devices. Class covers the following topics: fundamentals of Hardware Description Languages; VHDL syntax and semantics; behavioral, functional, structural and register-transfer descriptions; combinational circuits; finite state machines; levels of system simulation; arithmetic and sequential blocks and interfaces; pipelined and systolic processors; advanced VHDL language features and extensions; specification of controllers and data path architectures; reconfigurable Field Programmable Gate Array systems; verilog for VHDL programmers. Students must complete two computer-based software mini-projects and a project. Also offered as ECE 690 and may be taken only once for credit.

Prerequisite: graduate standing in ECE.

ECE 591 - Laser Systems Design I (4)
Laser topics: especially design of laser, fiberoptic, and related optical systems. Formation and propagation of modes and beams, matrix methods for the analysis and synthesis of optical systems. Also offered for undergraduate-level credit as ECE 491 and may be taken only once for credit.

Prerequisite: ECE 331.

ECE 592 - Laser Systems Design II (4)
Interaction of light with atoms, Maxwell Schrodinger analysis and rate equation approximations. Effects of gain, dispersion, and saturation in the design of laser amplifiers and oscillators. Also offered for undergraduate-level credit as ECE 492 and may be taken only once for credit. Expected preparation: ECE 331.

ECE 594 - Applied Optics (4)
An overview of optics and such principal applications as fiberoptics; chemical, biological, and physical sensors; optical information processing, acousto-optics; lasers and detectors. This course is the same as Ph 564; course may only be taken once for credit. Recommended prerequisites: Ph 203 or 213 or 223, Mth 261.

Crosslisted as: Ph 564.

ECE 596 - Optoelectronics II (4)
Nonlinear optics, parametric oscillation, frequency conversion, self-focusing, acousto-optics, Brillouin scattering, Raman scattering, magneto-optics, opto-optics.

ECE 598 - Introduction to Quantum Mechanics (4)
An introduction to the formulation and application of wave mechanics; the Schrodinger equation and its application to time-independent problems (both one- and three-dimensional problems); identical particles; approximation methods including mainly time-independent perturbations. Brief exploration of the potential applications of quantum mechanics to engineering: quantum nano-structures and quantum computers. This course is the same as Ph 511; course may only be taken once for credit. Recommended prerequisites: Ph 318 or 311, Mth 261.

Crosslisted as: Ph 511.

ECE 601 - Research (1-12)
(Credit to be arranged.)

ECE 603 - Dissertation (1-12)
(Credit to be arranged.)

ECE 604 - Cooperative Education/Internship (1-9)
(Credit to be arranged.)

ECE 605 - Reading And Conference (1-9)
(Credit to be arranged.)

ECE 606 - Special Problems/Projects (1-9)
(Credit to be arranged.)

ECE 607 - Seminar (1-9)
(Credit to be arranged.)

ECE 610 - Selected Topics (1-9)
(Credit to be arranged.)

ECE 611 - Solid State Electronics I (4)
The solid state electronics course sequence deals with advanced topics in solid state device physics and modeling. Following a discussion on semiconductor properties and modeling as a function of doping and temperature, advanced bipolar transistor structures and MOS transistors will be treated in detail. Device models aimed at numerical circuit simulators will be discussed. Also offered for ECE 511 and may be taken only once for credit. This is the first course in a sequence of three: ECE 611, ECE 612, and ECE 613.

Prerequisite: ECE 323.

ECE 612 - Solid State Electronics II (4)
The solid state electronics course sequence deals with advanced topics in solid state device physics and modeling. Following a discussion on semiconductor properties and modeling as a function of doping and temperature, advanced bipolar transistor structures and MOS transistors will be treated in detail. Device models aimed at numerical circuit simulators will be discussed. Also offered for ECE 512 and may be taken only once for credit. This is the
second course in a sequence of three: ECE 611, ECE 612, and ECE 613.
Prerequisite: ECE 323.

ECE 613 - Solid State Electronics III (4)
The solid state electronics course sequence deals with advanced topics in solid state device physics and modeling. Following a discussion on semiconductor properties and modeling as a function of doping and temperature, advanced bipolar transistor structures and MOS transistors will be treated in detail. Device models aimed at numerical circuit simulators will be discussed. Also offered for ECE 513 and may be taken only once for credit. This is the third course in a sequence of three: ECE 611, ECE 612, and ECE 613.
Prerequisite: ECE 323.

ECE 623 - Analog Integrated Circuit Design III (4)
Integrated-circuit oscillators and timers, frequency-to-voltage converters, phase-locked-loop circuits, IC filters, self-tuning filters, digital-to-analog converters, analog-to-digital converters, CAD tools for circuit design and testing.
Prerequisite: ECE 422/522.

ECE 624 - Advanced Embedded In Silico and In Materio Computing (4)
Introduces and develops the advanced hardware and software concepts, design methodologies, and programming paradigms of emerging embedded in silico and in materio computing systems. Topics covered: physics of computation, spatial computing paradigms, self-assembly and self-organization, morphogenetic systems, molecular and nano-scale computing, non-classical computing and non-classical programming paradigms, amorphous computing. Also offered as ECE 524 and may be taken only once for credit.
Prerequisite: ECE 371 or permission of the instructor.

ECE 627 - High-performance Digital Systems (4)
The use of computer-aided design tools in high performance digital systems is explored. The trade-offs between automated and hand design are examined in the context of performance vs. development time. The impact of new developments in MOS circuit technology are also examined. Also offered as ECE 527 and may be taken only once for credit.
Prerequisite: ECE 426/526.

ECE 629 - CAD for ULSI and Emerging Technologies (4)
Course will cover Computer-Aided Design (CAD) challenges for ultra submicron CMOS system design and circuit and system design in new emerging technologies. It will cover (1) system design approaches and optimization techniques in the presence of process and environmental parameter variations (2) statistical approaches to circuit and system design, (3) physical design (layout) role in performance evaluation of digital systems, and (4) design and architecture outlook for beyond CMOS Switches. Also offered as ECE 529 and may be taken only once for credit.
Prerequisite: ECE 428/528 or consent of instructor.

ECE 633 - Advanced Electromagnetics (4)
Advanced course in electromagnetics. Mathematical methods, electrostatics, boundary value problems, magnetostatics, time varying fields, plane waves. Also offered as ECE 533 and may be taken only once for credit.
Prerequisite: ECE 331.

ECE 634 - Acoustics (4)
Fundamentals of linear acoustics: acoustic wave equations, scattering theory and acoustic propagation. Numerical techniques. Applications emphasizing underwater acoustics and medical ultrasound. Also offered as ECE 534 and may be taken only once for credit.
Prerequisite: graduate standing.

ECE 635 - Electromagnetic Fields and Interactions (4)
Classical description of the electromagnetic field: classical electron theory and plasmas. This course is the same as Ph 631, Ph 632, Ph 633; course may only be taken once for credit. This is the first course in a sequence of three: ECE 635, ECE 636, and ECE 637.
Prerequisite: ECE 331 or Ph 431. Crosslisted as: Ph 631.

ECE 636 - Electromagnetic Fields and Interactions (4)
Classical description of the electromagnetic field: classical electron theory and plasmas. This course is the same as Ph 631, Ph 632, Ph 633; course may only be taken once for credit. This is the second course in a sequence of three: ECE 635, ECE 636, and ECE 637.
Prerequisite: ECE 331 or Ph 431. Crosslisted as: Ph 632.

ECE 637 - Electromagnetic Fields and Interactions (4)
Classical description of the electromagnetic field: classical electron theory and plasmas. This course is the same as Ph 631, Ph 632, Ph 633; course may only be taken once for credit. This is the third course in a sequence of three: ECE 635, ECE 636, and ECE 637.
Prerequisite: ECE 331 or Ph 431. Crosslisted as: Ph 633.

ECE 638 - Statistical Signal Processing I: Nonparametric Estimation (4)
Unified introduction to the theory, implementation, and applications of statistical signal processing methods. Focus on estimation theory, random signal modeling, characterization of stochastic signals and systems, and nonparametric estimation. Designed to give a solid foundation in the underlying theory balanced with a discussion of the practical advantages and limitations of nonparametric estimation methods. Also offered as ECE 538 and may be taken only once for credit.
Prerequisite: Mth 261 and ECE 565/665. Should have some proficiency at programming in MATLAB.

ECE 639 - Statistical Signal Processing II: Linear Estimation (4)
Unified introduction to the theory, implementation, and application of statistical signal processing methods. Focus on optimum linear filters, least square filters, the Kalman filter, signal modeling, and parametric spectral estimation. Designed to give a solid foundation in the underlying theory balanced with examples of practical applications and limitations. Recommended: ECE 538/638. ECE 541 Transmission Operation and Control, (4) Introduces the following topics: state estimation, security analysis, contingency monitoring, optimal
ECE 641 - Power System Planning (4)

Regulatory issues, power quality, system design for reliability, transient and voltage considerations, distributed generation, information technology requirements, market implications, remedial action and contingency analysis, NERC requirements.

Prerequisite: ECE 420/520, or instructor permission.

ECE 653 - Control Systems Design III (4)

Topics in modern feedback control theory of nonlinear and multivariable systems, including considerations of stochastic and optimal control. Design methods of computer workstations.

Prerequisite: ECE 452/552.

ECE 665 - Signals and Noise (4)

Students are introduced to “noise” as it appears in communication and control systems, its mathematical and statistical properties and practical filtering methods to minimize its impact on systems. Advanced topics in filter and estimation theory are also introduced.

Prerequisite: graduate standing in electrical engineering. Also offered as ECE 565 and may be taken only once for credit.

Prerequisite: ECE 223.

ECE 666 - Digital Signal Processing (4)

Study of discrete time signals and systems. Mathematics of discrete time systems in time and frequency domains. Discrete Fourier Transform, FFT algorithms and applications, digital filter design, random signals in digital linear systems form the foundations of this course. Also offered as ECE 566 and may be taken only once for credit.

Prerequisite: ECE 565/665.

ECE 667 - Statistical Communications Theory (4)

As an advanced course in communication theory, topics of statistical decision, estimation, and modulation theory are introduced. Statistical aspects of transmission detection and error detection/correction schemes are covered. Also offered as ECE 567 and may be taken only once for credit.

Prerequisite: ECE 461/561, 565/665.

ECE 668 - Introductory Image Processing (4)

Two-dimensional systems, image perception, image digitization (sampling and quantization), image transforms (Fourier, Cosine, K-L transforms), image enhancement (histogram equalization, filtering, spatial operation). Also offered as ECE 568 and may be taken only once for credit.

Prerequisite: ECE 223.

ECE 669 - Advanced Image Processing (4)

Introduction to random fields, image representation by stochastic models, image restoration (Wiener and Kalman filtering), image coding and compression predictive and transform coding, vector quantization). Also offered as ECE 569 and may be taken only once for credit.

Prerequisite: ECE 565/665, ECE 568/668.

ECE 670 - Computer Vision (4)

Image detection and registration, image analysis (texture extraction, edge detection, segmentation), image reconstruction (radon transform, Fourier reconstruction), stereo imaging and motion analysis, pattern recognition (recognition, classification and clustering).

Prerequisite: ECE 568/668.

ECE 672 - Advanced Logic Synthesis (4)

Boolean and multivalued algebras. Cube calculus and its computer realization. Basic operators and algorithms of function minimization. Decomposition and factorization theories. Multilevel minimization. Orthogonal expansions and tree circuits. Cellular logic and its applications to Field Programmable Gate Arrays. Spectral theory of logic optimization. Ordered Binary and Multiple-Valued Decision Diagrams. Design for speed, testability, power consumption, reliability, Reed-Muller forms, and EXOR circuits. Technology mapping. Modern logic synthesis programs, systems, and methodologies. Project that continues in ECE 573. Also offered as ECE 572 and may be taken only once for credit.

Prerequisite: ECE 271.

ECE 673 - Control Unit Design (4)


Prerequisite: ECE 572/672.

ECE 674 - High-level Synthesis and Design Automation (4)

Comprehensive design automation systems. Problems of system and high-level synthesis. Register-transfer and hardware description languages. Data path design: scheduling and allocation. Design methods for systolic, pipelined, cellular and dynamic architectures. System issues. System-level silicon compilers. Group project: using high-level tools for design of a complete VLSI ASIC chip or FPGA architecture: vision, DSP, or controller. Also offered as ECE 574 and may be taken only once for credit.

Prerequisite: ECE 573/673.

ECE 675 - Introduction to Integrated Circuit Test (4)

Course will cover the traditional role of IC test in parametric and functional testing and the changing role of IC testing in semiconductor design and manufacturing. The course is divided into three parts. The first part reviews integrated circuit technologies and fault modeling. The second introduces digital IC test, DC parametric testing, and functional and structural testing. The third part examines technology trends. Also offered as ECE 575 and may be taken only once for credit.

Prerequisite: ECE 425/525, ECE 416/516.
ECE 676 - Computational Methods in Electrical Engineering (4)

Students are introduced to advanced mathematical techniques applicable to electrical engineering. Content includes topics such as: optimization techniques, solution of partial differential equations, solution of eigenvalue problems, Fourier methods, vector space operations, and complex variable theory. Additional mathematical topics will be introduced as application examples at the discretion of the instructor. Also offered as ECE 575 and may be taken only once for credit.

Prerequisite: ECE 575.

ECE 677 - Interactive Computer Graphics (4)

An introduction to the principles of interactive computer graphics including logical devices, physical devices, transformation, viewing and clipping in two and three dimensions.

Prerequisite: ECE 575/675.

ECE 682 - Formal Verification of Hardware/Software Systems (4)

Objective is to introduce the main formal verification methods of hardware/software systems. Topics to be covered include: formal logics for system verification (first-order logic, higher order logic, temporal logic), formal specifications, theorem proving systems, microprocessor verification, and system software verifications. Also offered as ECE 582 and may be taken only once for credit.

Prerequisite: ECE 371, or CS 321, CS 333.

ECE 687 - Advanced Computer Architecture I (4)

An advanced course in computer system architecture and design. Key topics include advanced CPU implementation techniques including pipelining, dynamic instruction issue, superscalar architectures, and vector processing; high performance memory and IO systems design; an introduction to parallel computers; and a survey of current literature in computer architecture and of current advanced computer systems. Students will begin a project that will be completed in ECE 588/688. Also offered as ECE 587 and may be taken only once for credit.

Prerequisite: 486/586.

ECE 688 - Advanced Computer Architecture II (4)

Discussion of parallel computer architectures and their uses. Key topics include MIMD architectures; associative processing; shared-memory and message-passing architectures; dataflow and reduction architectures; special-purpose processors; design and analysis of interconnection networks; and an overview of parallel software issues. Students will complete the project started in ECE 587/687. Also offered as ECE 588 and may be taken only once for credit.

Prerequisite: ECE 587/687.

ECE 689 - Performance Analysis of Local Area Networks (4)


Prerequisite: ECE 587/687.

ECE 690 - Digital Design Using Hardware Description Languages (4)

An introductory graduate class to digital design using hardware description languages and to advanced digital design for programmable devices. Class covers the following topics: fundamentals of Hardware Description Languages; VHDL syntax and semantics; behavioral, functional, structural and register-transfer descriptions; combinational circuits; finite state machines; levels of system simulation; arithmetic and sequential blocks and interfaces; pipelined and systolic processors; advanced VHDL language features and extensions; specification of controllers and data path architectures; reconfigurable Field Programmable Gate Array systems; verilog for VHDL programmers. Students must complete two computer-based software mini-projects and a project. Also offered as ECE 590 and may be taken only once for credit.

Prerequisite: Upper-division standing.

ECE 696 - Optoelectronics II (4)

Nonlinear optics, parametric oscillation, frequency conversion, self-focusing, acousto-optics, Brillouin scattering, Raman scattering, magneto-optics, opto-optics.

Ed - Education

Ed 150 - Teaching as a Career (2)

Exploration of the challenges and privileges of teaching children and young adults in American public schools. Examines the purpose of schools and schooling, learning as a developmental process, and teaching as a skilled profession.

Ed 199 - Special Studies (1-4)

(Credit to be arranged.)

Ed 407 - Seminar (1-6)

(Credit to be arranged.)

Ed 410 - Experimental Course (1-6)

(Credit to be arranged.)

Ed 420 - Introduction to Education and Society (4)

Explores the nature of public education in the social context of the United States. Purpose is to develop critical ways of thinking about schools as social institutions and as a means of cultural transmission and transformation. Includes one credit (30 hour) assigned practicum in public school setting. Also offered for graduate-level credit as Ed 520 and may be taken only once for credit.

Ed 488 - Inclusive Early Childhood Models (3)

Presents different approaches to early childhood education with a focus on inclusion and consultation in typical early childhood settings. Provides a framework for recommended practices for supporting young children with disabilities in early childhood settings. Discusses the underlying concepts and application of developmentally appropriate practice. Also offered for graduate-level credit as Ed 588 and may be taken only once for credit.

Prerequisite: Upper-division standing.

Ed 506 - Special Problems (1-8)

(Credit to be arranged.)

Ed 507 - Seminar (1-6)

(Credit to be arranged.)
Ed 509 - Practicum of Children/Youth (1-9)
(Credit to be arranged.) Consent of instructor.

Ed 510 - Experimental Course (1 - 6)
(Credit to be arranged.)

Ed 511 - Reading/Language Arts Pre-K-12 (3)
Provides an overview of language development and general education literacy instruction from pre-kindergarten to 12th grade. Age-appropriate methods for literacy instruction at each grade level are discussed and evaluated with respect to the exceptional learner.
Prerequisite: Psy 311, Ed 520.

Ed 518 - Inclusive Elementary Classrooms (2)
Overview of teaching students who experience disabilities and giftedness, with special consideration to cultural/linguistic factors. Provides an overview of applicable laws and regulations, eligibility for special education, and the IEP process. Explores the ramifications of learning diversity for the inclusive elementary classroom teacher and instruction that supports all learners.
Prerequisite: Admission into the Graduate Teacher Education Program.

Ed 519 - Inclusive Secondary Classrooms (3)
Overview of teaching students who experience disabilities and giftedness, with special consideration to cultural/linguistic factors. Provides an overview of applicable laws and regulations, eligibility for special education, and the IEP process. Explores the ramifications of learning diversity for the inclusive secondary classroom teacher and instruction that supports all learners.
Prerequisite: Admission into the Graduate Teacher Education Program.

Ed 520 - Introduction to Education and Society (4)
Explores the nature of public education in the social context of the United States. Purpose is to develop critical ways of thinking about schools as social institutions and as a means of cultural transmission and transformation. Includes one credit (30 hour) assigned practicum in public school setting. Also offered for undergraduate-level credit as Ed 420 and may be taken only once for credit.

Ed 525 - Student Teaching (6-15)
(Credits to be arranged.)

Ed 530 - Introduction to Inclusion and Special Education (2)
Provides an introduction to special education and the philosophy and practices associated with inclusive education. Provides historical, social and legal foundations for inclusive education. Provides students with an opportunity to develop and defend a position regarding the inclusion of students with special needs in general education.
Prerequisite: Admission to the Inclusive Elementary Educators Program.

Ed 531 - Planning and Instruction for Students with Special Needs (3)
This course examines instructional methods, knowledge, and skills needed by elementary classroom and special education teachers for the instruction of students with special learning needs. Other content includes relevant federal and state policies and procedures, individual education plans, and differentiated lesson plans.
Prerequisite: Admission to the Inclusive Elementary Educators Program.

Ed 532 - Human Development and Learning (3)
Students will develop an understanding of psychological concepts, theories, and principles and apply them to learning and instruction. Four areas of psychological research that have significant implications for learning will be emphasized: cognitive and metacognitive factors, motivational and affective factors, developmental and social factors, and individual differences.
Prerequisite: Admission to the Inclusive Elementary Educators Program.

Ed 533 - Literacy Methods for the Inclusive Classroom: I (3)
Provides a foundation in research-based instruction for teaching literacy to early childhood/elementary students in inclusive educational settings. Provides an overview of language and literacy development for typical and atypical learners. Presents effective instructional practices for teaching and assessing emerging reading, beginning reading, primary and intermediate decoding skills, vocabulary, comprehension, and writing. Practice opportunities will be provided at the teacher candidates' field experience sites.
Prerequisite: Admission to the Inclusive Elementary Educators Program.

Ed 534 - Literacy Methods for the Inclusive Classroom (3)
This course will examine instructional methods that are effective for teaching all students to read, write, and spell. Emphasis will be placed on key processes that have been demonstrated through research to be essential for developing competency in reading, writing, and spelling for students with special learning needs.
Prerequisite: Admission to the Inclusive Elementary Educators Program.

Ed 535 - Classroom Based Assessment for the Inclusive Educator (2)
This course provides a theoretical framework for using assessment to guide instructional decisions. Teacher candidates will learn about formative assessment and data-based decision-making. The primary focus of the course is for teacher candidates to learn to understand critical features of assessment in education and use assessment to guide instructional decisions.
Prerequisite: Admission to the Inclusive Elementary Educators Program.

Ed 536 - Educational Research and Inclusive Education (3)
The goals of this course are to enable students to become intelligent consumers of educational research, assist students in the conceptualization and design of a research project, aid students in developing an understanding of the scientific process, and aid students in developing an understanding of research- and evidence-based educational practice.
Prerequisite: Admission to the Inclusive Elementary Educators Program.

Ed 537 - Professional Seminar I: Law and Ethics (1)
This course has two major focuses: educational law and policy at the federal and state level, and ethics of the teaching profession. The course is also a forum for reflection and discussion of field experience.
Prerequisite: Admission to the Inclusive Elementary Educators Program.
Ed 538 - Professional Seminar II: Philosophy (1)

This course provides a forum for discussion and reflection of the field experience, leads to the creation of a teaching philosophy statement and provides guidance for the completion of the work sample.

Prerequisite: Admission to the Inclusive Elementary Educators Program.

Ed 539 - Professional Seminar III: Reflection and Job Search (1)

This course serves multiple purposes. It serves as a vehicle for discussion and reflection of field experiences. Seminars will focus on preparing materials for the job search. Some seminar time will be used for student advising re licensure and graduation.

Prerequisite: Admission to the Inclusive Elementary Educators Program.

Ed 540 - Functional Assessment for the Inclusive Elementary Educator (3)

Develops philosophical and social foundations for services to individuals with significant and multiple disabilities, early childhood through elementary. Emphasizes ecological and functional assessment strategies for life skills, communication, social, motor, and functional academic domains. Strategies for including students with significant and multiple disabilities in system-wide, standards-based assessment are addressed.

Prerequisite: Admission to the Inclusive Elementary Educators Program.

Ed 541 - Functional Curriculum for the Inclusive Elementary Educator (3)

Course applies knowledge and skills for functional assessment and applied behavior analysis in the design and implementation of an individualized, functional curriculum for students with significant and multiple disabilities, early childhood through elementary.

Prerequisite: Admission to the Inclusive Elementary Educators Program.

Ed 542 - Collaboration for the Inclusive Elementary Educator (2)

This course covers broadly the context, process, and content of collaboration and teamwork in the schools with a specific focus on the inclusion of students with disabilities and special needs in general education classrooms. Other topics include co-teaching, problem solving, and conflict resolution.

Prerequisite: Admission to the Inclusive Elementary Educators Program.

Ed 543 - Specialized Techniques for the Inclusive Elementary Educator (1)

Presents information and skills necessary for meeting the specialized support needs of students with significant disabilities. Course is designed to assist the educator in becoming an effective member of a trans-disciplinary team that serves students with routine and emergency medical and physical needs and is taught from an inclusive perspective.

Prerequisite: Admission to the Inclusive Elementary Educators Program.

Ed 550 - Foundations in Early Childhood and Inclusive Education (4)

Focus on foundations of and approaches to inclusive early childhood education. Learn about developmental and inclusive practices, develop foundational knowledge and examine and challenge assumptions about inclusive teaching and learning.

Prerequisite: Admission to the Masters in Early Childhood Education: Inclusive Education and Curriculum and Instruction.

Ed 551 - Child Development in Early Childhood and Inclusive Education (4)

Study a multicultural perspective of child development (i.e., physical, social and emotional, language and literacy, cognitive) for young children (prenatal – preschool) with a range of ability levels. Examine theories of development and how those theories apply to young children with differing ability levels.

Prerequisite: Admission to the Masters in Early Childhood Education: Inclusive Education and Curriculum and Instruction.

Ed 552 - Issues in Early Childhood and Inclusive Education (4)

Study contemporary issues related to inclusion in early childhood programs for children of all ability levels. Identify and respond to critical issues in contemporary early childhood education as it relates to inclusion. Analyze those issues from a variety of perspectives.

Prerequisite: Admission to the Masters in Early Childhood Education: Inclusive Education and Curriculum and Instruction.

Ed 580 - Adolescent Learners in Inclusive Settings (2)

Focuses on principles of human learning and related practices for teaching in inclusive classrooms in the middle/high school setting. The psychology of learning in a school setting includes both individual and group generalizations, with an emphasis on the developmental tasks of adolescence. Examines the roles and functions of teachers as facilitators of learning, and as decision makers concerning pupil needs and achievement in inclusive middle/high school settings.

Prerequisite: admission to SDEP.

Ed 581 - Inclusive Classroom Researcher (2)

Frames research questions concerning the principles, practices, promises, and problems of inclusive classrooms. Explores the philosophical and practical benefits of inclusive practices. Teacher networks, literature reviews and research design will provide the groundwork for collecting data throughout the program.

Prerequisite: admission to SDEP.

Ed 582 - Collaborative Teaming and the Special Education Process (4)

Introduction to special education law and processes that prepare future teachers to actively participate, plan and facilitate IEP and school team meetings. Includes an overview of state and federal laws/regulations, the IEP process and special education service delivery systems. Explores collaborative teaming processes in middle and secondary school settings.

Prerequisite: Psy 311 and admission to SDEP program.

Ed 583 - Study Skills and Learning Strategies (2)

Examines typical secondary class demands and instructional methods to enable students with disabilities and other low achievers to become independent learners. Emphasis on content enhancement tools to increase accessibility of content as well as instructional methods for teaching study skills and learning strategies. Includes
models and methods for infusing this instruction into the secondary curriculum.

Prerequisite: admission to SDEP program.

**Ed 584 - Advocacy and Transition Planning (2)**

Focuses on student support and advocacy, school-family collaboration and transition planning. Concepts and curriculum related to person-centered planning and teaching self-determination skills addressed. Examines collaborative skills needed to empower students, families, communities, service agencies, and other support systems and facilitate inclusive practices in secondary settings.

Prerequisite: admission to SDEP program.

**Ed 585 - Instructional Planning for Inclusive Classrooms (4)**

Addresses principles and skills for organization and presentation of grades 6-12 inclusive classroom instruction. Includes: student needs analysis, unit planning using backward design, direct and indirect instructional techniques that incorporate state and national standards in teaching a diverse group of adolescent learners.

Prerequisite: admission to SDEP program.

**Ed 586 - Collaborative Teaching (2)**

Students will study practices and techniques that enhance instructional collaboration and consultation among general education and special education teaching professionals. Models and methods for supporting students with disabilities in middle and secondary school general education classrooms will be explored.

Prerequisite: Admission to SDEP and (Advocacy and Planning with Secondary Students, Collaborative Teaming).

**Ed 587 - Inclusive Educational Research and Leadership (2)**

Critically reviews the principles, practices, promises, and problems of inclusive education. Teacher candidate work samples, compilation and analysis of action research data, and educational leadership project provide culminating experiences blending the dual perspectives of general and special education and benefits of inclusive practices in teaching content to all students.

Prerequisite: admission to SDEP program.

**Ed 588 - Inclusive Early Childhood Models (3)**

Presents different approaches to early childhood education with a focus on inclusion and consultation in typical early childhood settings. Provides a framework for recommended practices for supporting young children with disabilities in early childhood settings. Discusses the underlying concepts and application of developmentally appropriate practice. Also offered for undergraduate-level credit as Ed 488 and may be taken only once for credit.

**Ed 607 - Seminar (1-9)**

(Credit to be arranged.)

**Ed 610 - Experimental Course (1-4)**

(Credit to be arranged.)

**Ed 620 - Doctoral Studies Proseminar (1-4)**

This three course four-credit sequence is required for all doctoral students and is taken during the first year of doctoral study, beginning with two credits in the fall and one credit each in winter and spring terms. The course is designed to extend and deepen thinking about education, "educational leadership" and inquiry through shared readings, interaction with faculty and local educational leaders, and critical reflective writing and conversation. Students are expected to initiate and maintain a learning and a professional portfolio and by the end of spring term to develop and present a formal paper that examines an educational issue using frameworks and concepts from Ed 630, 640 and 650, which are also taken during their first year. This paper may serve as an initial draft of the doctoral core examination paper.

Prerequisite: admission to doctoral program or permission of instructor.

**Ed 630 - Principles and Practices of Learning (4)**

The study of theories of learning in a variety of educational contexts: classrooms for youth and for adults, counseling, and non-school settings. Study of the narratives of teaching and learning to analyze the enactment of theory and to examine the variety of ways to research learning.

Prerequisite: admission to doctoral program or permission of instructor.

**Ed 640 - Organizational and Leadership Theory and Research in Education (4)**

Organizational and leadership theory and research in education informing the study, practice, and improvement of educational policy and practice in PreK-12 school, higher education, and non-school contexts; emphasis on emergent perspectives and their significance for theory, research, and practice.

Prerequisite: admission to doctoral program or permission of instructor.

**Ed 650 - Educational Policy and Politics (4)**

The study of how policy is proposed, adopted, implemented, and changed in educational organizations. Special emphasis on the political process and how it influences the policy cycle.

Prerequisite: admission to doctoral program or permission of instructor.

**Ed 660 - Foundations of Research Paradigms and Methods (4)**

An introduction to research paradigms and research methodologies that are useful to better understand and/or address problems of educational practice. Provides doctoral students with knowledge of basic processes of inquiry so they are able to begin designing individual research projects.

Prerequisite: admission to doctoral program and/or EPFA 511 or 515 or permission of instructor.

**Ed 661 - Qualitative Research Methods in Education (4)**

Introduces qualitative research methods of data collection and analysis in education. Reviews theoretical foundations, field research problems, and qualitative data collection and analysis methods including participant observation, depth interviewing, and development of grounded theory.

Prerequisite: admission to doctoral program or permission of instructor.

**Ed 662 - Quantitative Research Methods in Education (4)**

Introduces quantitative research methods of data collection and analysis in education. Reviews theoretical foundations, applications and design issues of methods such as survey, correlational and experimental research. Also, introduces how
to conduct a statistical data analysis and use such methods as correlation, t-test, analysis of variance and chi-square.

Prerequisite: admission to doctoral program or permission of instructor.

Ed 700 - In-service Education (1-6)

(Credit to be arranged.) Credits are for district in-service and are not counted toward a graduate degree or specialist license.

ELP - Educational Ldrshp & Policy

ELP 199 - Special Studies (1-4)

(Credit to be arranged.)

ELP 318 - Introduction to Educational Leadership in Public Schools (4)

Familiarizes students with the theoretical development, empirical studies, policies, and decision making processes of public schooling. Structured around a number of themes, including instructional leadership, moral leadership, democratic leadership, facilitative leadership, curricular leadership, constructivist leadership, and ethical leadership in education. Students explore the operational meaning of these perspectives through a combination of experiences including class discussions, case studies, guest speakers, and interviews and observations of school leaders at work. Course includes an additional, concurrent 30-hour minimum field project requirement.

ELP 318U - Introduction to Educational Leadership in Public Schools (4)

Familiarizes students with the theoretical development, empirical studies, policies, and decision making processes of public schooling. Structured around a number of themes, including instructional leadership, moral leadership, democratic leadership, facilitative leadership, curricular leadership, constructivist leadership, and ethical leadership in education. Students explore the operational meaning of these perspectives through a combination of experiences including class discussions, case studies, guest speakers, and interviews and observations of school leaders at work. Course includes an additional, concurrent 30-hour minimum field project requirement.

ELP 324 - Introduction to Spiritual Leadership (4)

An introductory exploration into spirituality and its connection to leadership. The meaning of engaged spiritual leadership will be examined through such themes as: identity, paradox, interconnectedness, and sustainability. A community-based field project offers an opportunity to examine leadership issues through the lens of spirituality.

ELP 324U - Introduction to Spiritual Leadership (4)

An introductory exploration into spirituality and its connection to leadership. The meaning of engaged spiritual leadership will be examined through such themes as: identity, paradox, interconnectedness, and sustainability. A community-based field project offers an opportunity to examine leadership issues through the lens of spirituality.

ELP 348 - Introduction to Global Political Ecology (4)

In order to grasp the emerging discipline of political ecology, engages in discussions regarding the following: impact of globalization on human and non-human communities; relationship between poverty and environmental degradation; distribution of resource use and commodification in the global North and global South, and the relationship of these issues in our personal lives.

ELP 348U - Introduction to Global Political Ecology (4)

In order to grasp the emerging discipline of political ecology, engages in discussions regarding the following: impact of globalization on human and non-human communities; relationship between poverty and environmental degradation; distribution of resource use and commodification in the global North and global South, and the relationship of these issues in our personal lives.

ELP 349 - Gandhi, Zapata and New Agrarianism (4)

This course explores the emergence of "new agrarianism" by examining the social, political, economic and ecological implications of agriculture, and the revolutionary efforts of Zapata and Gandhi against the abuses of modern industrial practices. Recent philosophical and ecological models of new agrarianism are introduced, with emphasis on local food systems.

ELP 349U - Gandhi, Zapata and New Agrarianism (4)

This course explores the emergence of "new agrarianism" by examining the social, political, economic and ecological implications of agriculture, and the revolutionary efforts of Zapata and Gandhi against the abuses of modern industrial practices. Recent philosophical and ecological models of new agrarianism are introduced, with emphasis on local food systems.

ELP 350 - Introduction to Leadership for Sustainability (4)

Multi-media seminar and discussion course reviews, analyzes and critiques the history, politics and rhetoric of sustainability. Four key themes are covered: issues surrounding the Johannesburg Summit 2002; growing conservation economy in the Pacific Northwest; the issue of indigenous cultures and sustainability, and a critical review of the emergence and future of transnational civil society. Examines the very idea of local, regional, and global and discusses the role social movement networks, information society, and globalization play in meaningful social change and leadership.

ELP 350U - Introduction to Leadership for Sustainability (4)

Multi-media seminar and discussion course reviews, analyzes and critiques the history, politics and rhetoric of sustainability. Four key themes are covered: issues surrounding the Johannesburg Summit 2002; growing conservation economy in the Pacific Northwest; the issue of indigenous cultures and sustainability, and a critical review of the emergence and future of transnational civil society. Examines the very idea of local, regional, and global and discusses the role social movement networks, information society, and globalization play in meaningful social change and leadership.

ELP 351 - Gender and Education (4)

Explores the significance of gender in educational work. The focus will be on the history of gender arrangements in educational organizations and the formation of gender roles in contemporary American
society, particularly in the family, schools, and the economy. Students will examine differential socialization of males and females, ongoing practices in educational organizations that are gender-related and/or gender biased and the convergence of gender, race, and class in educational organizations. This course is cross-listed as WS 455, may only be taken once for credit. ELP 555 includes an additional, concurrent 30 hour minimum field project requirement.

ELP 351U - Gender and Education (4)
Explores the significance of gender in educational work. The focus will be on the history of gender arrangements in educational organizations and the formation of gender roles in contemporary American society, particularly in the family, schools, and the economy. Students will examine differential socialization of males and females, ongoing practices in educational organizations that are gender-related and/or gender biased and the convergence of gender, race, and class in educational organizations. This course is cross-listed as WS 455, may only be taken once for credit. ELP 555 includes an additional, concurrent 30 hour minimum field project requirement.

ELP 356 - The Urban School and "at Risk" Status (4)
Draws upon theory, research, and practice for the examination of the conditions of being "at-risk" in urban schools. Explores the family, community, and school environments and their relationships in the hindrance of development of children and youth leading to their "at-risk" status. ELP 556 includes an additional, concurrent 30 hour minimum field project requirement.

ELP 356U - The Urban School and "at Risk" Status (4)
Draws upon theory, research, and practice for the examination of the conditions of being "at-risk" in urban schools. Explores the family, community, and school environments and their relationships in the hindrance of development of children and youth leading to their "at-risk" status. ELP 556 includes an additional, concurrent 30 hour minimum field project requirement.

ELP 362 - Introduction to School and Community Relations (4)
Major emphasis will be on exploring the ways schools interact with parents, citizens and special interest groups that lead to building a diverse community. Course includes an additional, concurrent 30-hour minimum field project requirement.

ELP 362U - Introduction to School and Community Relations (4)
Major emphasis will be on exploring the ways schools interact with parents, citizens and special interest groups that lead to building a diverse community. Course includes an additional, concurrent 30-hour minimum field project requirement.

ELP 399 - Special Studies (1-4)
(Credit to be arranged.)

ELP 401 - Research (1-6)
(Credit to be arranged.)

ELP 402 - Independent Study (1-12)
(Credit to be arranged.)

ELP 403 - Thesis (1-6)
(Credit to be arranged.)

ELP 404 - Cooperative Education/Internship (1-12)
(Credit to be arranged.)

ELP 405 - Reading and Conference (1-6)
(Credit to be arranged.)

ELP 406 - Special Problems (1-12)
(Credits to be arranged.)

ELP 407 - Seminar (1-6)
(Credit to be arranged.)

ELP 408 - Workshop (1-6)
(Credit to be arranged.)

ELP 409 - Practicum (1-9)
(Credit to be arranged.)

ELP 410 - Experimental Course (1-6)
(Credit to be arranged.)

ELP 429 - Principles of Training and Development (3)
Examination of the principles of training and development with emphasis on applying adult learning theory to the training function. Essential principles include those related to developing training objectives, selecting training methods and resources, sequencing the learning experiences, and evaluating the training. Designed for trainers from a variety of work settings with a strong background in a content area who have little background in adult learning theory and its application to training and development practices. Also offered for graduate-level credit as ELP 529 and may be taken only once for credit.

ELP 430 - Course Design and Evaluation (4)
Examination of the field of instructional program design for adult learners within the training and development field, in educational and non-educational organizational settings. Focus on learning to design and manage instructional activities in response to training needs and skills analyses. Students are required to select and use an appropriate design model, design a preliminary needs assessment, develop program goals and learning objectives, develop an instructional plan, develop a plan to assess student learning and evaluate the program, and critically review the design document. Major emphasis given to developing the instructional design document that demonstrates a student’s ability to align and integrate effectively all aspects of the design process and to incorporate adult learning theory. Also offered for graduate-level credit as ELP 530 and may be taken only once for credit. Expected preparation: ELP 429/529.

ELP 431 - Contemporary Issues in Training and Development (3)
Building on competencies developed during previous courses in the training and development series, provides a culminating experience to the series. Provides an opportunity for students to examine national and local trends in training and organizational development and to prepare for ongoing professional growth in the context of contemporary issues in the field. Also offered for graduate-level credit as ELP 531 and may be taken only once for credit. Recommended prerequisite: ELP 429/529 plus two other courses in the series.

ELP 432 - Training Methods (3)
Focuses on instructional strategies and effective delivery of training programs necessary for enhancing adult learning and professional development. Students will examine individual learning preferences and multiple types of active pedagogy for increasing transfer of learning. In addition, various techniques and tools for linking
learning outcomes with organizational goals will be addressed. Also offered for graduate-level credit as ELP 532 and may be taken only once for credit.

Prerequisite: ELP 429/529.

ELP 434 - Leadership of the Training Function (3)

Focuses upon research-based, practical approaches for leading, managing, and evaluating the training and development function in organizations. It explores the role of training and development in achieving individual and organizational goals, as well as strategies and resources used in effective personnel development. Students analyze how to: develop, manage and evaluate the training function; identify strategies and resources for effective training management; and diagnose how the organization's culture and needs affect the selection and success of training management efforts. Also offered for graduate-level credit as ELP 534 and may be taken only once for credit.

Prerequisite: ELP 429/529.

ELP 435 - Organization Transformation through Training and Development (3)

Designed for managers of the training and development function in organizations, this course focuses on the role of training and development in organization transformation, improvement, and change. The course provides opportunities to bring real workplace examples into the classroom and to apply organization development and systems theory in the development strategies for organization improvement through the training and development function. Also offered for graduate-level credit as ELP 535 and may be taken only once for credit.

Prerequisite: ELP 429/529.

ELP 439 - Developing Training Materials (3)

Focus on the theories, knowledge ad skills necessary to plan, develop and use effective participant and presentation training materials that enhance adult learning in training and development settings. Study the linkage of instructional design, adult learning representational systems and graphic design theories and how materials increase transfer of learning. In addition, examine writing issues relevant to effective communication, the selection and use of production methods, and project plans for training materials. Also offered for graduate-level credit as ELP 539 and may be taken only once for credit.

ELP 440 - Urban Farm Education: Leveraging Policy and Research to Cultivate Garden-Based Education in Practice (4)

Students explore the policy and research context surrounding garden-based education in schools and communities with a focus on instructional design and assessment. As a learning community, students examine how policies and educational practices can pose barriers or potential leverage points for systemic change, and develop and teach integrated garden-based curriculum. Also offered for graduate-level credit as ELP 540 and may be taken only once for credit.

Prerequisite: Upper-division standing.

ELP 444 - eLearning Instructional Design (3)

Design of a self-paced eLearning simulation with appropriate instructional methods, user interface designs, media choices, and levels of interactivity and engagement. Also offered for graduate-level credit as ELP 544 and may be taken only once for credit. Expected preparation: ELP 484 or ELP 429.

Prerequisite: Upper-division standing.

ELP 445 - Developing eLearning (4)

Examination of development methodologies/processes, principles of task identification, risk mitigation, technical architecture, creative tools, and project management strategies used in developing eLearning. Application of learning theory to the development of eLearning. Also offered for graduate-level credit as ELP 545 and may be taken only once for credit. Expected preparation: ELP 429 and ELP 430.

Prerequisite: Upper-division standing.

ELP 446 - Early Childhood Education: Relationships with Home and Society (3)

Considers the sociology of families and communities in the development of cooperative relationships with programs for young children. Also offered for graduate-level credit as ELP 546 and may be taken only once for credit.

Prerequisite: Undergraduate early childhood education coursework or teaching experience with young children.

ELP 447 - Administration of Early Childhood Programs (3)

Examines theory and practice informing the administration/leadership of early childhood programs to include: 1) organizational configurations, 2) leadership and the dynamics of the work group, 3) developmentally appropriate curriculum, 4) interaction with families of young children, and 5) significance of poverty, race, and gender for such programs. Also offered for graduate-level credit as ELP 547 and may be taken only once for credit.

Prerequisite: child and family studies major or admission to an education graduate program.

ELP 451 - Social Foundations of Education (4)

Study of sociological theories that illuminate the effects of education on individuals and society. Problem areas in race, class, and gender are explored in the process of examining theories of socialization, certification, allocation, and legitimation and their application to historical and current educational situations. Also offered for graduate-level credit as ELP 551 and may be taken only once for credit.

ELP 452 - History of Education (3)

A general review of the growth and development of education in relation to the civilization of the times; emphasis is placed upon the development of educational theories at various points in history. Also offered for graduate-level credit as ELP 552 and may be taken only once for credit.

ELP 453 - History of American Education (4)

The historical development of the American educational system, from European backgrounds and colonial beginnings to the present time. Also offered for graduate-level credit as ELP 553 and may be taken only once for credit.

ELP 454 - Philosophy of Education (4)

Study and comparison of the philosophical bases of educational ideas and of the educational implications of philosophical thought. Also offered for graduate-level credit as ELP 554 and may be taken only once for credit. ELP 554 includes an additional, concurrent 30 hour minimum field project requirement.
ELP 457 - Cultural Pluralism and Urban Education (4)

This course is designed to explore the process of education policy development and implementation in culturally diverse, urban environments. The course is organized around several cultural pluralism perspectives; among the topics to be explored are the issues of socialization of the child, governmental operations, educational administration, teacher preparation and curriculum design. Also offered for graduate-level credit as ELP 557 and may be taken only once for credit. ELP 557 includes an additional, concurrent 30 hour minimum field project requirement.

ELP 465 - ELL School Community Relations (3)

Learn how to work with families to overcome barriers to setting-up support systems in and out of school. Access appropriate community resources that can be critical for ensuring classroom success with ELL students. Gain understanding about other cultures’ orientations to education and school. Learn strategies to build bridges between home, school, and the community. Also offered for graduate-level credit as ELP 565 and may be taken only once for credit.

ELP 466 - Impact of Language and Culture in the Classroom (3)

Learn the importance of intercultural communication in working with children from a wide range of cultures in today’s classroom. Survey the cultural, linguistic, educational, and ethical issues present in all classrooms today. Study the sociological and language issues and immigration history. Learn how to identify and appreciate cultural factors that affect social adjustment and learning. Also offered for graduate-level credit as ELP 566 and may be taken only once for credit.

ELP 467 - ESL/Bilingual Program Design and Models (3)

Exemplary schools provide second language learners with a rich intellectual diet, not a remedial or basic skills curriculum. They expect all students to achieve high standards in literacy and other academic areas. Learn how these schools combine their understandings and apply the knowledge of local, state, and federal laws and policies along with pedagogical considerations to create effective programs. Participants will examine a variety of local, regional, and national program models for ESL and Bilingual instruction. This will create opportunities to develop expertise in assessing the critical components of programs serving pre-school through adults. Also offered for graduate-level credit as ELP 567 and may be taken only once for credit.

ELP 484 - Strategies for eLearning (3)

Best practices in eLearning and pedagogical issues related to design, development, and delivery. Application of research in learning and cognition to eLearning for design, analysis and problem solving. Also offered for graduate-level credit as ELP 584 and may be taken only once for credit.

Prerequisite: Upper-division standing.

ELP 501 - Research (1-9)

(Credit to be arranged.)

ELP 502 - Independent Study (1-9)

(Credit to be arranged.)

ELP 503 - Thesis (1-9)

(Credit to be arranged.)

ELP 504 - Cooperative Education/Internship (1-9)

(Credit to be arranged.)

ELP 505 - Reading and Conference (1-6)

(Credit to be arranged.)

ELP 506 - Special Problems (1-6)

See department for course description

ELP 507 - Seminar (1-6)

(Credit to be arranged.)

ELP 508 - Workshop (1-6)

(Credit to be arranged.)

ELP 509 - Practicum (0-9)

(Credit to be arranged.)

ELP 510 - Selected Studies (1-6)

(Credit to be arranged.)

ELP 511 - Principles of Educational Research and Data Analysis I (4)

Research paradigm; measurement and test characteristics; planning and evaluation; library resources; identifying research problems; planning research; types of research; research designs, central tendency, variability and relationships; sampling, sampling error, and hypothesis testing; crossbreaks; one, two, and multiple group, and multiple independent variable designs; computer applications; information systems. This is the first course in a sequence of two: ELP 511 and ELP 512.

Prerequisite: graduate standing.

ELP 512 - Principles of Educational Research and Data Analysis II (4)

Research paradigm; measurement and test characteristics; planning and evaluation; library resources; identifying research problems; planning research; types of research; research designs, central tendency, variability and relationships; sampling, sampling error, and hypothesis testing; crossbreaks; one, two, and multiple group, and multiple independent variable designs; computer applications; information systems. This is the second course in a sequence of two: ELP 511 and ELP 512.

Prerequisite: graduate standing.

ELP 513 - Advanced Research Designs and Data Analysis in Education (4)

Designs for multiple independent variables; equating designs for multigroups; designs for multiple dependent variables; follow-up procedures for multiple dependent variable designs; selected data collection methods, including questionnaires, interviews, observation, sociometry, and objective tests and scales; computer application in the use of selected designs.

Prerequisite: ELP 512.

ELP 514 - Educational Measurement and Assessment (4)

Minimum competency, norm-referenced, and criterion-referenced tests; classroom student assessment; characteristics and levels of measurement; reliability; validity; interpreting test scores; standardized tests; using performance standards; planning and constructing classroom selection; supply and performance tests; portfolio assessment; evaluating test items.

Prerequisite: graduate standing.

ELP 515 - Program Evaluation (4)

An examination of evaluation theory and approaches and their applications in educational settings. Emphasis is given to
program evaluation and to understanding how the usefulness of evaluation results may be increased.

Prerequisite: graduate standing.  

**ELP 516 - Collaborative Ethnographic Research Methods (4)**

Explores if and how a participatory and collaborative form of research will foster knowledge democracy, and give ownership to those whose knowledge it is. Methodologies covered are: different genres of qualitative methods, community-based planning and research, participatory action-research, Gaian participatory science, classical ethnography, auto-ethnography, ethnographic performance, life histories, feminist methodologies, and "dialogue circles." Also offered as ELP 616 and may be taken only once for credit.

**ELP 517 - Ecological and Cultural Foundations of Learning (4)**

Explores how we teach and learn ecologically and what constitutes ecological and cultural ways of knowing. One of the key foundational courses for LECL specialization, this course is beyond simply justifying or advocating that our education should be grounded in ecological principals. Rather it offers an opportunity to engage in critical and comparative analyses of what has been already accomplished and the new areas of innovations in environmental education, mature education, outdoors education, naturalist training, and other such genres. Also offered as ELP 617 and may be taken only once for credit.

**ELP 519 - Sustainability Education (4)**

Course covers local, national, and global innovation in light of the UN decade for Education for Sustainability (2005-15). We also critically assess earlier traditions such as nature education, environmental education, outdoor education, place-based education, and ecological literacy. Students are involved in developing curriculum and teacher preparation modules for K-12.

**ELP 520 - Developmental Perspectives on Adult Learning (4)**

Explores professional applications of adult development theory and research to facilitating adult learning in a wide variety of contexts, including formal educational and training programs as well as general environments such as learning organizations. Course includes an additional, concurrent 30 hour minimum field project requirement.

Prerequisite: admission to a graduate program.  

**ELP 521 - Adult Learning and Motivation (4)**

An examination of the complex interaction among adult development, motivation, and learning. Attention is focused on the intra- and inter-personal dynamics that motivate human behavior in general, and how they specifically motivate adult learning and behavior within a wide variety of educational settings. Course includes additional, concurrent 30-hour minimum field project requirement.

Prerequisite: graduate standing. Completion of ELP 520, Developmental Perspectives on Adult Learning, highly recommended.  

**ELP 522 - Teaching Diverse Adult Learners (4)**

An examination of the theoretical, philosophical, and practical aspects of teaching adult students regarding issues of difference and diversity in the classroom. Students will develop skills in planning, delivering, and evaluating individual and group learning activities in a wide variety of learning environments. Course includes additional, concurrent 30-hour minimum field project requirement.

Prerequisite: graduate standing. Completion of ELP 520, Developmental Perspectives on Adult Learning, highly recommended.  

**ELP 523 - Assessing Adult Learning (4)**

Introduction to the approaches, processes, and tools that can be used to assess adult learning. Emphasis is given to applications at the classroom and program levels and to practices that themselves contribute to adult learning. Course includes an additional, concurrent 30-hour minimum field project requirement.

Prerequisite: graduate standing.  

**ELP 524 - Spiritual Leadership for Sustainable Change (4)**

This course explores how spirituality is integrated into teaching and learning, and into the work of engaged citizens. Spiritual leadership is explored through such themes such as: authenticity, identity, paradox, relationships, and sustainability. Community-based learning provides an opportunity to examine leadership and sustainability issues through a spiritual lens.

**ELP 525 - Student Services in Higher Education (4)**

Provides an introduction to the professional field of student affairs within the context of colleges and universities, including its historical, philosophical, ethical, and theoretical foundations. Current and future issues for the profession are also critically examined. Course includes an additional concurrent 30-hour minimum field project requirement.

Prerequisite: graduate standing.  

**ELP 526 - Facilitating Student Success in Postsecondary Education (4)**

Provides an introduction to theory and research related to factors and conditions that affect student success in postsecondary education and to assessment approaches and techniques in student services. Informed by theory, research, and practice, students develop an intervention proposal related to facilitating student success and a plan for assessing that intervention.

Prerequisite: graduate standing.  

**ELP 527 - Legal Issues in Higher Education (4)**

Provides a general introduction to the law related to higher education and professional practice in colleges and universities. In addition to the substance of related law, the course explores how the law is applied to rules and policy and how ethical standards and principles impact that application. Course includes an additional concurrent 30-hour minimum field project requirement.

Prerequisite: graduate standing.  

**ELP 528 - Leadership in Postsecondary Education (4)**

Examines emerging conceptualizations and forms of leadership and leadership development in postsecondary education. Ethical and value bases of leadership inform a focus on the creation of organizational and social change within postsecondary settings. Course emphasizes non-hierarchical models of leadership that value diversity and involve collaborative relationships and collective action. Application of leadership development issues within a variety of
ELP 529 - Principles of Training and Development (3)

Examination of the principles of training and development with emphasis on applying adult learning theory to the training function. Essential principles include those related to developing training objectives, selecting training methods and resources, sequencing the learning experiences, and evaluating the training. Designed for trainers from a variety of work settings with a strong background in a content area who have little background in adult learning theory and its application to training and development practices. Also offered for undergraduate-level credit as ELP 429 and may be taken only once for credit.

ELP 530 - Course Design and Evaluation (4)

Examination of the field of instructional program design for adult learners within the training and development field, in educational and non-educational organizational settings. Focus on learning to design and manage instructional activities in response to training needs and skills analyses. Students are required to select and use an appropriate design model, design a preliminary needs assessment, develop program goals and learning objectives, develop an instructional plan, develop a plan to assess student learning and evaluate the program, and critically review the design document. Major emphasis given to developing the instructional design document that demonstrates a student’s ability to align and integrate effectively all aspects of the design process and to incorporate adult learning theory. Also offered for undergraduate-level credit as ELP 430 and may be taken only once for credit. Expected preparation: ELP 429/529.

ELP 531 - Contemporary Issues in Training and Development (3)

Building on competencies developed during previous courses in the training and development series, provides a culminating experience to the series. Provides an opportunity for students to examine national and local trends in training and organizational development and to prepare for ongoing professional growth in the context of contemporary issues in the field. Also offered for undergraduate-level credit as ELP 431 and may be taken only once for credit. Recommended prerequisite: ELP 429/529 plus two other courses in the series.

ELP 532 - Training Methods (3)

Focuses on instructional strategies and effective delivery of training programs necessary for enhancing adult learning and professional development. Students will examine individual learning preferences and multiple types of active pedagogy for increasing transfer of learning. In addition, various techniques and tools for linking learning outcomes with organizational goals will be addressed. Also offered for undergraduate-level credit as ELP 432 and may be taken only once for credit. Prerequisite: ELP 429/529.

ELP 533 - Planning and Budgeting in Postsecondary Education (4)

Provides an introduction to the planning and budgeting processes used in colleges and universities. Major emphasis is placed on key concepts, planning models, and applications to institutional cases. Strategies for linking planning and budgeting function will be explored. Students will examine and use various planning and budgeting tools and techniques. Budget reduction and the connection between planning and assessment will be examined. Prerequisite: graduate standing.

ELP 534 - Leadership of the Training Function (3)

Focuses upon research-based, practical approaches for leading, managing, and evaluating the training and development function in organizations. It explores the role of training and development in achieving individual and organizational goals, as well as strategies and resources used in effective personnel development. Students analyze how to: develop, manage and evaluate the training function; identify strategies and resources for effective training management; and diagnose how the organization’s culture and needs affect the selection and success of training management efforts. Also offered for undergraduate-level credit as ELP 434 and may be taken only once for credit. Prerequisite: ELP 429/529.

ELP 535 - Organization Transformation through Training and Development (3)

Designed for managers of the training and development function in organizations, this course focuses on the role of training and development in organization transformation, improvement, and change. The course provides opportunities to bring real workplace examples into the classroom and to apply organization development and systems theory in the development strategies for organization improvement through the training and development function. Also offered for undergraduate-level credit as ELP 435 and may be taken only once for credit. Prerequisite: ELP 429/529.

ELP 536 - Postsecondary Curriculum (4)

Provides an introduction to the field of curriculum or program design for adult learners and introduces students to a process of program planning and development. Curriculum development or design is viewed as both a technical and political process. It also provides a historical and philosophical perspective on postsecondary curriculum, with attention given to review and analysis of current practices and issues, including lifelong and collaborative learning. A comprehensive program planning model will be examined. Prerequisite: graduate standing.

ELP 537 - Policy and Governance in Postsecondary Education (4)

An examination of theory and research that relates to how policy is formulated and implemented in postsecondary environments. The course focuses on the policy and governance role of faculty, administrators, and trustees at the single college or university level, and state and federal roles in postsecondary policy and governance. Prerequisite: graduate standing.

ELP 538 - Contemporary Issues in Postsecondary Education (4)

The course is designed to provide students with an introduction to the study of postsecondary education using as the vehicle a focus on some of the more pressing issues currently facing postsecondary education. The course is designed to increase the capacity for the identification
and analyses of issues and the development of positions relative to the issue.

Prerequisite: graduate standing. .

ELP 539 - Developing Training Materials (3)
Focus on the theories, knowledge ad skills necessary to plan, develop and use effective participant and presentation training materials that enhance adult learning in training and development settings. Study the linkage of instructional design, adult learning representational systems and graphic design theories and how materials increase transfer of learning. In addition, examine writing issues relevant to effective communication, the selection and use of production methods, and project plans for training materials. Also offered for undergraduate-level credit as ELP 439 and may be taken only once for credit.

ELP 540 - Urban Farm Education: Leveraging Policy and Research to Cultivate Garden-Based Education in Practice (4)
Students explore the policy and research context surrounding garden-based education in schools and communities with a focus on instructional design and assessment. As a learning community, students examine how policies and educational practices can pose barriers or potential leverage points for systemic change, and develop and teach integrated garden-based curriculum. Also offered for undergraduate-level credit as ELP 440 and may be taken only once for credit.

ELP 541 - The Community College (4)
An introduction to the two-year college in the United States, with an emphasis on the public community college with a comprehensive educational program. Topics include: transfer studies; career education; general education; community services; basic skills education; and student development services. The purpose of the course is to provide students with theoretical and practical knowledge relative to the history, philosophy, students, staff, services, and patterns of organization of the public community college.

ELP 542 - Introduction to Service-Learning: Theoretical & Pedagogical Perspectives in Postsecondary Education (4)
Fundamental principles and practices of service-learning in postsecondary education. Service-learning pedagogy, its relationship to adult development, historical foundations in educational institutions, and civic education. Resources and organizations, and issues of race, class, gender, and power in service-learning. Required participation in a service-learning project provides practice in application of theories.

ELP 543 - Service-Learning & Community Based Learning in Postsecondary Educational Leadership & Policy Dom (4)
Service-learning in postsecondary educational institutions, their leadership, and policy. Role, organization, and policy of service-learning in different postsecondary institutions, from community colleges through graduate schools, and the varying ways in which service-learning is structured, researched, and assessed. Practical and theoretical concerns in an applied service-learning experience in the metro area. Challenges and opportunities of partnerships between academic institutions and community-based organizations. Implications of service-learning for students, faculty, partners, and the community in the context of civic engagement, social justice, and social change.

ELP 544 - eLearning Instructional Design (3)
Design of a self-paced eLearning simulation with appropriate instructional methods, user interface designs, media choices, and levels of interactivity and engagement. Also offered for undergraduate-level credit as ELP 444 and may be taken only once for credit. Expected preparation: ELP 584 or ELP 529.

ELP 545 - Developing eLearning (4)
Examination of development methodologies/processes, principles of task identification, risk mitigation, technical architecture, creative tools, and project management strategies used in developing eLearning. Application of learning theory to the development of eLearning. Also offered for undergraduate-level credit as ELP 445 and may be taken only once for credit. Expected preparation: ELP 529 and ELP 530.

ELP 546 - Early Childhood Education: Relationships with Home and Society (3)
Considers the sociology of families and communities in the development of cooperative relationships with programs for young children. Also offered for undergraduate-level credit as ELP 446 and may be taken only once for credit.

Prerequisite: Undergraduate early childhood education coursework or teaching experience with young children. .

ELP 547 - Administration of Early Childhood Programs (3)
Examines theory and practice informing the administration/leadership of early childhood programs to include: 1) organizational configurations, 2) leadership and the dynamics of the work group, 3) developmentally appropriate curriculum, 4) interaction with families of young children, and 5) significance of poverty, race, and gender for such programs. Also offered for undergraduate-level credit as ELP 447 and may be taken only once for credit.

Prerequisite: child and family studies major or admission to an education graduate program. .

ELP 548 - Advanced Global Political Ecology (4)
In order to grasp the emerging discipline of political ecology, we cover the following themes: the impact of globalization on human and non-human communities; the relationship between poverty and environmental degradation; the distribution of resource use and commodification in the global North and global South; and the relationship of these issues in our personal lives. Students apply these concepts in real life through a multi-media study and presentation of a commodity in terms of its production, distribution and consumption.

ELP 549 - Service-Learning & Community Based Learning in Postsecondary Educational Leadership & Policy Intl (4)
Service-learning in postsecondary educational institutions, their leadership, and policy. Role, organization, and policy of service-learning in different postsecondary institutions, from community colleges through graduate schools, and the varying ways in which service-learning is structured, researched, and assessed. Practical and theoretical concerns in an applied service-learning experience abroad. Challenges and opportunities of international service-learning. Implications of service-learning for students, faculty, partners, and the community in the context of civic engagement, social justice, and social change. Also offered as ELP 649 and may be taken only once for credit.
ELP 550 - Advanced Leadership for Sustainability (4)
This multi-media seminar and discussion course will review, analyze and critique the history, politics and rhetoric of sustainability. Four key themes are covered within the rubric of leadership for sustainability: the issues surrounding the Johannesburg summit, 2002, the growing conservation economy in the Pacific Northwest, the issue of indigenous cultures, and sustainability. Students apply these concepts in real life by developing a wildest dream project in sustainability and outlining social, natural and economic capital needed to implement it.

ELP 551 - Social Foundations of Education (4)
Study of sociological theories that illuminate the effects of education on individuals and society. Problem areas in race, class, and gender are explored in the process of examining theories of socialization, certification, allocation, and legitimation and their application to historical and current educational situations. Also offered for undergraduate-level credit as ELP 451 and may be taken only once for credit.

ELP 552 - History of Education (3)
A general review of the growth and development of education in relation to the civilization of the times; emphasis is placed upon the development of educational theories at various points in history. Also offered for undergraduate-level credit as ELP 452 and may be taken only once for credit.

ELP 553 - History of American Education (4)
The historical development of the American educational system, from European backgrounds and colonial beginnings to the present time. Also offered for undergraduate-level credit as ELP 453 and may be taken only once for credit.

ELP 554 - Philosophy of Education (4)
Study and comparison of the philosophical bases of educational ideas and of the educational implications of philosophical thought. Also offered for undergraduate-level credit as ELP 454 and may be taken only once for credit. ELP 554 includes an additional, concurrent 30 hour minimum field project requirement.

ELP 557 - Cultural Pluralism and Urban Education (4)
This course is designed to explore the process of education policy development and implementation in culturally diverse, urban environments. The course is organized around several cultural pluralism perspectives; among the topics to be explored are the issues of socialization of the child, governmental operations, educational administration, teacher preparation and curriculum design. Also offered for undergraduate-level credit as ELP 457 and may be taken only once for credit. ELP 557 includes an additional, concurrent 30 hour minimum field project requirement.

ELP 558 - Educational Leadership (4)
Analysis of leadership theories, skills, and techniques as applied to the organization and administration of public education.
Prerequisite: graduate standing.

ELP 559 - The Principalship (4)
Designed to develop complementary theoretical and practical understanding of the principalship; to acquire knowledge and to learn practices and skills needed to become a successful first-year principal.
Prerequisite: ELP 569.

ELP 560 - Supervision and Evaluation of Instruction (4)
The role of the supervisor in keeping education geared to the changing demands of society; theories of leadership; group processes and individual conference techniques; action research and related approaches to curriculum change; analysis of concrete supervisory problems.

ELP 561 - Staff Development: Planning, Implementation, and Evaluation (4)
Staff development goals; characteristics of staff development programs; establishing a staff development organization; policy and decision-making; identifying and responding to the concerns of participants; assessing needs; planning and implementation of specific programs; networking; formal and informal methods of evaluation; models for staff development; program evaluation; management information systems; evaluating instructional effectiveness.
Prerequisite: graduate standing.

ELP 562 - School and Community Relations (4)
An intensive examination of the school and its environment. Major emphasis is on the linking mechanisms utilized by the school in interacting with parents, citizens, and special interest groups. Course includes an additional, concurrent 30 hour minimum field project requirement.
Prerequisite: graduate standing.

ELP 563 - Human Relations in Educational Organizations (4)
Issues and perspectives in group processes; models for studying groups; principles of group dynamics; human relations within educational organizations; strategies for group problem-solving and conflict management; application of group dynamics to leadership, communication, and decision-making within educational organizations; evaluating processes and production of educational groups.
Prerequisite: graduate standing.

ELP 564 - Administration of Curriculum (4)
Provides a broad and critical understanding of curricular matters that are relevant and important to administrators: 1) decision making about the choice of content; 2) politics of curriculum development; 3) implementation and monitoring of curriculum at building site; 4) testing and alignment of curriculum; and 5) evaluation of curriculum implementation.
Prerequisite: graduate standing.

ELP 565 - ELL School Community Relations (3)
Learn how to work with families to overcome barriers to setting-up support systems in and out of school. Access appropriate community resources that can be critical for ensuring classroom success with ELL students. Gain understanding about other cultures’ orientations to education and school. Learn strategies to build bridges between home, school, and the community. Also offered for undergraduate-level credit as ELP 465 and may be taken only once for credit.

ELP 566 - Impact of Language and Culture in the Classroom (3)
Learn the importance of intercultural communication in working with children.
from a wide range of cultures in today’s classroom. Survey the cultural, linguistic, educational, and ethical issues present in all classrooms today. Study the sociological and language issues and immigration history. Learn how to identify and appreciate cultural factors that affect social adjustment and learning. Also offered for undergraduate-level credit as ELP 466 and may be taken only once for credit.

**ELP 567 - ESL/Bilingual Program Design and Models (3)**

Exemplary schools provide second language learners with a rich intellectual diet, not a remedial or basic skills curriculum. They expect all students to achieve high standards in literacy and other academic areas. Learn how these schools combine their understandings and apply the knowledge of local, state, and federal laws and policies along with pedagogical considerations to create effective programs. Participants will examine a variety of local, regional, and national program models for ESL and Bilingual instruction. This will create opportunities to develop expertise in assessing the critical components of programs serving pre-school through adults. Also offered for undergraduate-level credit as ELP 467 and may be taken only once for credit.

**ELP 568 - Educational Organization and Administration (4)**

Examination of the role, functions, and responsibilities of the educational leaders and administrators; study of administrative and organizational theory and its application to the operation of educational programs and organizations in various settings, including school districts, higher education and educational divisions in private sector organizations. Course includes an additional, concurrent 30 hour minimum field project requirement.

Prerequisite: graduate standing.

**ELP 569 - Introduction to Educational Administration (4)**

Introductory course required of applicants to the Initial Administrator certificate program. Considers educational, social, political, economic, organizational, and cultural forces shaping U.S. public schools and their administration. Course includes an additional, concurrent 30 hour minimum field project requirement.

**ELP 570 - Human Relations and Educational Foundations (4)**

Explores the historical, social, philosophical, and organizational foundations of public education. Examines the dynamics of human relationships, leadership, and community building in schools and educational settings. Examines public education goals and decision-making processes for achieving these goals.

Prerequisite: admission to initial administrator program; ELP 569.

**ELP 571 - Teaching, Learning, and Curriculum (4)**

Examines the complex relationships between staff evaluation, individual professional development, staff development, and effective teaching, learning, and curriculum. Students will examine those factors which make supervision and evaluation really work, i.e., contribute to the larger purpose of building an environment where teachers can deliver their best and children can learn most.

Prerequisite: ELP 570.

**ELP 572 - Human Resource Development and Organizational Change (4)**

Examines how the relationships between people and organizational structures, policies, and processes influence school culture and change efforts. Studies how school leaders secure and manage resources to improve teaching and learning for all within the school community.

Prerequisite: ELP 571.

**ELP 573 - Educational Leadership Project I (4)**

Focus on the development, in a school or agency setting, of an Educational Leadership Project demonstrating knowledge, skills, and dispositions required by the TSPC Initial Administrator License Standards. The first quarter of a three quarter project designed in conjunction with a practicum supervisor to address a leadership challenge area in teaching and learning for student success within an assigned practicum setting. Students will define the challenge area, research the problem context and related literature, and develop an action plan.

Prerequisite: admission to Initial Administrator Licensure Program.

**ELP 574 - Education Leadership Project II (1)**

Focus on the implementation, in a school or agency setting, of an Educational Leadership Project demonstrating knowledge, skills, and dispositions required by the TSPC Initial Administrator License Standards. The second quarter of a three quarter project designed in conjunction with a practicum supervisor to address a leadership challenge area in teaching and learning for student success within an assigned practicum setting. Students will implement their action plan by collecting, organizing, and analyzing data.

Prerequisite: admission to the Initial Administrator Licensure Program, ELP 573.

**ELP 575 - Educational Leadership Project III (1)**

Focus on final analysis of an Educational Leadership Project demonstrating knowledge, skills, and dispositions required by the TSPC Initial Administrator License Standards. The third quarter of a three quarter project designed in conjunction with a practicum supervisor to address a leadership challenge area in teaching and learning for student success within an assigned practicum setting. Students will analyze the outcome of their year-long project, suggest implications for further research, and reflect on the entire project.

Prerequisite: admission to the Initial Administrator Licensure Program, ELP 573 and ELP 574.

**ELP 576 - Education, Community, and Society (4)**

A review of sociological theories and research that illuminates the social and economic functions of education in modern society, with special emphasis placed on application of the role of the practicing school administrator as instructional leader and manager. Race, class, gender, and differing ability levels are explored in the process of examining theories of socialization, certification, allocation, and legitimation and their application to historical and current educational situations, particularly in schools and school districts. 30-hours of field-based experiences are used to connect the theories and research covered in class to the practice of schooling and the work of a school administrator.
Prerequisite: admission to continuing administrator/licensure program or permission of instructor.

**ELP 577 - District and School Staff Supervision and Evaluation (4)**

Advanced course in alternative approaches to district and school staff supervision and evaluation in an era of school reform, heightened accountability, and emerging state and national standards. Topics to be covered are dealing with the at-risk and incompetent staff and new directions in teacher evaluation. 30-hours of field-based experiences are used to connect the theories and research covered in class to the practice of schooling and the work of a school administrator.

Prerequisite: admission to continuing administrator/licensure program or permission of instructor.

**ELP 578 - Communication and Conflict Management in Educational Organizations (4)**

Issues of communication within educational organizations and between educational organizations and various audiences. Definitions of conflict and models for peaceful resolution/management of conflict within educational organizations and with various other individuals and organizations. Attention to world view, cultural styles, positions, underlying needs, bargaining, reforming, and finding common ground. Strategies for group problem-solving, conflict management including collective bargaining and contract management, and community-building. 30 hours of field-based experiences are used to connect the theories and research covered in class to the practice of schooling and the work of a school administrator.

Prerequisite: admission to continuing administrator/licensure program or permission of instructor.

**ELP 579 - Curriculum, Instruction, and Assessment Leadership (4)**

An examination of standards-based reform, curriculum and instructional models, assessment models, school improvement strategies, and educational change theories. Emphasis is given to understanding how assessment information can be used to improve student learning and overall school performance within the context of Oregon’s state reform framework. 30 hours of field-based experiences are used to connect the theories and research covered in class to the practice of schooling and the work of a school administrator.

Prerequisite: admission to continuing administrator/licensure program or permission of instructor.

**ELP 580 - District Policy, Operations, Facilities, and Finance (4)**

The role of the district superintendent and local school boards in planning, management, evaluation, and improvement of policies and programs related to school operations, personnel, facilities, and finance to meet school district needs. Examines state and federal laws, regulations, and the roles of ODE and the legislature in governing Oregon school finance, school budgeting, and school facilities. 30 hours of field-based experiences are used to connect the theories and research covered in class to the practice of schooling and the work of a school administrator.

Prerequisite: admission to continuing administrator/licensure program or permission of instructor.

**ELP 581 - U.S. and Oregon School Law and Policy (4)**

Examines federal and Oregon school law governing educational practice and policy at the school and district levels; the relationships among these factors and their implications for effective communication with educational stakeholders, instruction and student learning, and effective organizational management of schools. 30 hours of field-based experiences are used to connect the theories and research covered in class to the practice of schooling and the work of a school administrator.

Prerequisite: admission to continuing administrator/licensure program or permission of instructor.

**ELP 582 - Teaching, Learning and Curriculum I (2)**

Examines the role of effective school leadership for best practices in teaching, learning and curriculum which promote the success of all students. Students will examine those factors which make supervision and evaluation really work, i.e., contribute to the larger purpose of building an environment where teachers can deliver their best and children can learn the most.

Prerequisite: admission to Initial Administrator Licensure Program. Must be taken concurrently with ELP 570.

**ELP 583 - Teaching, Learning and Curriculum II (2)**

Examines the complex relationships between staff evaluation, individual professional development, staff development, and effective teaching, learning, and curriculum. Students will formulate a working knowledge of the change process, staffing, program, and faculty needs within an educational setting through problem-based learning.

Prerequisite: admission to Initial Administrator Licensure Program, ELP 570 and ELP 582. Must be taken concurrently with ELP 572.

**ELP 584 - Strategies for eLearning (3)**

Best practices in elearning and pedagogical issues related to design, development, and delivery. Application of research in learning and cognition to elearning for design, analysis and problem solving. Also offered for undergraduate-level credit as ELP 484 and may be taken only once for credit.

**ELP 594 - School Law (4)**

Critical analysis of the legal framework governing school law in the United States, with emphasis on contemporary legal problems of education. Implications of landmark and current court decisions.

Prerequisite: graduate standing.

**ELP 601 - Research (1-9)**

(Credit to be arranged.)

**ELP 602 - Independent Study (1-9)**

(Credit to be arranged.)

**ELP 603 - Dissertation (1-16)**

(Credit to be arranged.)

**ELP 604 - Cooperative Education/Internship (1-9)**

(Credit to be arranged.)
ELP 605 - Reading and Conference (1-9)
(Credit to be arranged.)

ELP 606 - Special Problems/Projects (1-6)
(Credit to be arranged.)

ELP 607 - Seminar (1-6)
(Credit to be arranged.)

ELP 608 - Workshop (1-9)
(Credit to be arranged.)

ELP 609 - Practicum (0-9)
(Credit to be arranged.)

ELP 610 - Selected Topics (1-9)
(Credit to be arranged.)

ELP 616 - Collaborative Ethnographic Research Methods (4)
Explores if and how a participatory and collaborative form of research will foster knowledge democracy, and give ownership to those whose knowledge it is. Methodologies covered are: different genres of qualitative methods, community-based planning and research, participatory action-research, Gaian participatory science, classical ethnography, auto-ethnography, ethnographic performance, life histories, feminist methodologies, and “dialogue circles.” Also offered as ELP 516 and may be taken only once for credit.

ELP 617 - Ecological and Cultural Foundations of Learning (4)
Explores how we teach and learn ecologically and what constitutes ecological and cultural ways of knowing. One of the key foundational courses for ECL specialization, this course is beyond simply justifying or advocating that our education should be grounded in ecological principals. Rather it offers an opportunity to engage in critical and comparative analyses of what has been accomplished and the new areas of innovations in environmental education, mature education, outdoors education, naturalist training, and other such genres. Also offered as ELP 517 and may be taken only once for credit.

ELP 649 - Service-Learning & Community Based Learning in Postsecondary Educational Leadership & Policy Intl (4)
Service-learning in postsecondary educational institutions, their leadership, and policy. Role, organization, and policy of service-learning in different postsecondary institutions, from community colleges through graduate schools, and the varying ways in which service-learning is structured, researched, and assessed. Practical and theoretical concerns in an applied service-learning experience abroad. Challenges and opportunities of international service-learning. Implications of service-learning for students, faculty, partners, and the community in the context of civic engagement, social justice, and social change. Also offered as ELP 549 and may be taken only once for credit.

ELP 658 - Social, Historical, Philosophical, and Cultural Foundations of Education (4)
Seminar for education doctoral students providing a detailed exploration of texts with a focus on the institutional aspects of education, the intellectual currents that have supported it, and the social constructs that maintain it. Cultural, historical, social, philosophical, and critical and feminist perspectives as well as modernist viewpoints are included. Participants will read in-depth and write analytical response papers as a grounding for discussion in the seminar and will produce an end of term project or research paper.

Prerequisite: admission to the Graduate School of Education doctoral program or permission of instructor.

ELP 659 - Theory, Research, and Practice in Educational Administration (4)
Seminar for education doctoral students providing a detailed exploration of research and theory development in the field of educational administration. Participants will read in-depth and write analytical response papers as a basis for discussion in the seminar and will produce a term project or research paper.

Prerequisite: admission to the Graduate School of Education doctoral program or permission of instructor.

Eng 104 - Introduction to Fiction (4)
Reading, analysis, and appreciation of significant works of fiction.

Eng 105 - Introduction to Drama (4)
Reading, analysis, and appreciation of significant works of drama, from classical times to the present.

Eng 106 - Introduction to Poetry (4)
Reading, analysis, and appreciation of significant poems.

Eng 107 - World Literature (4)
Narrative prose, drama, and poetry. Complete books are included so that the student may become familiar with some of the masterpieces in world literature. This is the first course in a sequence of two: Eng 107 and Eng 108.

Eng 108 - World Literature (4)
Narrative prose, drama, and poetry. Complete books are included so that the student may become familiar with some of the masterpieces in world literature. This is
the second course in a sequence of two: Eng 107 and Eng 108.

Eng 199 - Special Studies (1-6)
See department for course description. (Credit to be arranged.)

Eng 201 - Introduction to Shakespeare (4)
Introduces students to the works of Shakespeare.

Eng 204 - Survey of English Literature (4)
From Beowulf to 1900: Eng 204, Beowulf to Milton; Eng 205, Enlightenment through Victorian period. This is the first course in a sequence of two: Eng 204 and Eng 205.

Eng 205 - Survey of English Literature (4)
From Beowulf to 1900: Eng 204, Beowulf to Milton; Eng 205, Enlightenment through Victorian period. This is the second course in a sequence of two: Eng 204 and Eng 205.

Eng 235 - Survey of American Literature (4)
American Literature from its beginnings to the present. This is the first course in a sequence of two: Eng 253 and Eng 254.

Eng 254 - Survey of American Literature (4)
American literature from its beginnings to the present. This is the second course in a sequence of two: Eng 253 and Eng 254.

Eng 260 - Introduction to Women's Literature (4)
Introduction to the texts and contexts of women's literature.

Eng 299 - Special Studies (1-9)
See department for course description. (Credit to be arranged.)

Eng 300 - Introduction to the English Major (4)
Focuses on methods of textual interpretation. This course provides students with the analytical and critical tools necessary for the successful study of English at the upper division level. Required for, but not restricted to, English majors. A prerequisite for 400-level English courses, English 300 is also strongly recommended as preparation for all upper-division English classes. Expected preparation: 8 lower-division credits in literature.

Eng 301 - Topics: Shakespeare (4)
Study of Shakespeare's works focusing on topics such as genre (tragedy, comedy, etc.), period (Elizabethan/Jacobean) or cultural context. Some familiarity with Shakespeare and/or the Renaissance is expected. Course may be repeated for credit with different topics.

Eng 301U - Topics: Shakespeare (4)
Study of Shakespeare's works focusing on topics such as genre (tragedy, comedy, etc.), period (Elizabethan/Jacobean) or cultural context. Some familiarity with Shakespeare and/or the Renaissance is expected. Course may be repeated for credit with different topics.

Eng 304 - Critical Theory of Cinema (4)
Outlines the central elements of cinema criticism, including interpretive theories and approaches. Begins with an outline of critical approaches, including critical history. Moves to contemporary criticism, including feminist, structuralist, sociological, and psychoanalytic analyses. Includes discussion of film as a cultural commodity.

Eng 305 - Topics in Film (4)
Study of film as text, including auteur, formalist, historical, and cultural perspectives. Course may be repeated for credit with different topics.

Eng 305U - Topics in Film (4)
Study of film as text, including auteur, formalist, historical, and cultural perspectives. Course may be repeated for credit with different topics.

Eng 306 - Topics in Literature and Popular Culture (4)
Study of literary issues in popular culture. Courses taught under this number may examine literature as a popular form (such as detective or romance fiction) and the relationship between literature and popular genres (such as comics or music), or use techniques of literary/textual analysis to analyze forms of popular culture (blogs, music videos, etc.). Course may be repeated for credit with different topics.

Eng 306U - Topics in Literature and Popular Culture (4)
Study of literary issues in popular culture. Courses taught under this number may examine literature as a popular form (such as detective or romance fiction) and the relationship between literature and popular genres (such as comics or music), or use techniques of literary/textual analysis to analyze forms of popular culture (blogs, music videos, etc.). Course may be repeated for credit with different topics.

Eng 307 - Science Fiction (4)
Study of recent science fiction, both novels and shorter fiction by American, European and other writers.

Eng 307U - Science Fiction (4)
Study of recent science fiction, both novels and shorter fiction by American, European and other writers.

Eng 309 - American Indian Literature (4)
An introductory survey of traditional and recent literature by American Indian people. Poetry, legends, myths, oratory, short stories, and novels, as well as background (historical and political) materials.

Eng 309U - American Indian Literature (4)
An introductory survey of traditional and recent literature by American Indian people. Poetry, legends, myths, oratory, short stories, and novels, as well as background (historical and political) materials.

Eng 310 - Children's Literature (4)
Looks at literary works written for children in their cultural contexts and focuses on changing notions about propriety, education, children's literature, and the very idea of childhood itself.

Eng 311 - Tragedy (4)
A study of the nature of tragedy in world literature.

Eng 312 - Comedy and Satire (4)
Study of drama and other literature that expresses comic social judgment, either to satirize or to celebrate.

Eng 313 - The American Short Story (4)
A survey of the American short story, from its beginnings in the 19th century to the present.

Eng 313U - The American Short Story (4)
A survey of the American short story, from its beginnings in the 19th century to the present.
Eng 314 - The Epic (4)
Reading in epic literature in the Western tradition and world literature, beginning with the Iliad and Odyssey.

Eng 315 - The Shorter Poem (4)
Shorter poems in world literature. Primary attention will be given to poems in the English language, but the classics of other languages will be read in translation as appropriate to tracing of forms and themes.

Eng 316 - The Short Story (4)
A survey of the short story as it developed from the tale, the legend, and the anecdote to its modern form. Although fiction from many literatures will be studied, all works will be read in English.

Eng 317 - Greek Mythology (4)
Greek mythology as recorded by Homer, Hesiod, Ovid, and various of the Greek playwrights and philosophers. Special attention is given to the Greek legacy of ideas, themes, figures, and images.

Eng 317U - Greek Mythology (4)
Greek mythology as recorded by Homer, Hesiod, Ovid, and various of the Greek playwrights and philosophers. Special attention is given to the Greek legacy of ideas, themes, figures, and images.

Eng 318 - The Bible as Literature (4)
A study of the various kinds of literature contained in the Bible. An analysis of the ways in which the Biblical expression reflects the cultural and historical milieu of the Hebraic-Christian experience.

Eng 318U - The Bible as Literature (4)
A study of the various kinds of literature contained in the Bible. An analysis of the ways in which the Biblical expression reflects the cultural and historical milieu of the Hebraic-Christian experience.

Eng 319 - Northern European Mythology (4)
Norse and Celtic mythologies in medieval texts.

Eng 319U - Northern European Mythology (4)
Norse and Celtic mythologies in medieval texts.

Eng 320 - The English Novel (4)
The English novel, from its beginnings to the present. Eng 320: From early fictional forms through the 18th century. Eng 321: From the 19th century to the present. This is the first course in a sequence of two: Eng 320 and Eng 321.

Eng 320U - The English Novel (4)
The English novel, from its beginnings to the present. Eng 320: From early fictional forms through the 18th century. Eng 321: From the 19th century to the present. This is the first course in a sequence of two: Eng 320 and Eng 321.

Eng 321 - English Novel (4)
The English novel, from its beginnings to the present. Eng 320: From early fictional forms through the 18th century. Eng 321: From the 19th century to the present. This is the second course in a sequence of two: Eng 320 and Eng 321.

Eng 325 - Postcolonial Literature (4)
Introduction to key texts, themes, issues, and approaches in postcolonial literature and theory.

Eng 330 - Jewish and Israeli Literature (4)
Introduction to modern Jewish literature in its diasporic and national contexts. Emphasis on the transition from sacred to secular literature; reflection of historical and social realities; development of literatures in Europe and the Middle East.

Eng 330U - Jewish and Israeli Literature (4)
Introduction to modern Jewish literature in its diasporic and national contexts. Emphasis on the transition from sacred to secular literature; reflection of historical and social realities; development of literatures in Europe and the Middle East.

Eng 331 - Introduction to Rhetoric and Composition Studies (4)
Introduction to contemporary issues in rhetoric and composition studies by way of the rhetorical tradition of Greece, the rise of composition in the modern North American university, and their relation to the process-oriented approach to composition which has dominated composition instruction since the 1960’s. Focuses are on such perennial issues as the relationship between writing and the self, the link between writing and “content,” the relationship of writing to speech and reading, the political dimensions of writing, and the role of the audience in composing.

Eng 331U - Introduction to Rhetoric and Composition Studies (4)
Introduction to contemporary issues in rhetoric and composition studies by way of the rhetorical tradition of Greece, the rise of composition in the modern North American university, and their relation to the process-oriented approach to composition which has dominated composition instruction since the 1960’s. Focuses are on such perennial issues as the relationship between writing and the self, the link between writing and “content,” the relationship of writing to speech and reading, the political dimensions of writing, and the role of the audience in composing.

Eng 332 - History of Cinema and Narrative Media I (4)
Surveys the history of cinema and narrative media from the late nineteenth-century moving image through the Second World War.

Eng 332U - History of Cinema and Narrative Media I (4)
Surveys the history of cinema and narrative media from the late nineteenth-century moving image through the Second World War.

Eng 333 - History of Cinema and Narrative Media II (4)
Surveys the history of cinema and narrative media from the end of the Second World War through the 1970s. Issues will include the impact of postwar artistic and literary movements, postwar consumer cultures, the cold war, new wave movements, television, youth culture, and third cinemas.

Eng 333U - History of Cinema and Narrative Media II (4)
Surveys the history of cinema and narrative media from the end of the Second World War through the 1970s. Issues will include the impact of postwar artistic and literary movements, postwar consumer cultures, the cold war, new wave movements, television, youth culture, and third cinemas.

Eng 334 - Topics in Film Genres and Movements (4)
Study of major aesthetic, cultural, and social movements in film. This is the same course.
as NAS 334 and may be repeated with different topics.

Eng 334U - Topics in Film Genres and Movements (4)
Study of major aesthetic, cultural, and social movements in film. This is the same course as NAS 334 and may be repeated with different topics.

Eng 335 - Topics in Literature and Film (4)
Study of the interplay between the textual and cinematic presentation: how these media have treated specific historical, social, and cultural phenomena, as well as the ways literature and film have inspired and influenced each other in terms of content, form, and audience. This is the same course as NAS 335 and may be repeated for credit with different topics.

Crosslisted as: NAS 335.

Eng 335U - Topics in Literature and Film (4)
Study of the interplay between the textual and cinematic presentation: how these media have treated specific historical, social, and cultural phenomena, as well as the ways literature and film have inspired and influenced each other in terms of content, form, and audience. This is the same course as NAS 335 and may be repeated for credit with different topics.

Crosslisted as: NAS 335U.

Eng 340 - Medieval Literature (4)
Selected works of medieval literature; introduction to the themes, genres, history, and cultures of the Middle Ages.

Eng 340U - Medieval Literature (4)
Selected works of medieval literature; introduction to the themes, genres, history, and cultures of the Middle Ages.

Eng 341 - Renaissance Literature (4)
Selected works of sixteenth- and early seventeenth-century literature (c. 1500-1660); introduction to the themes, genres, history and cultures of the Renaissance.

Eng 341U - Renaissance Literature (4)
Selected works of sixteenth- and early seventeenth-century literature (c. 1500-1660); introduction to the themes, genres, history and cultures of the Renaissance.

Eng 342 - Restoration and Eighteenth Century Literature (4)
Selected works from the long eighteenth century (1660-1800); introduction to themes, genres, history and culture of the eighteenth century.

Eng 342U - Restoration and Eighteenth Century Literature (4)
Selected works from the long eighteenth century (1660-1800); introduction to themes, genres, history and culture of the eighteenth century.

Eng 343 - Romanticism (4)
Selected works of Romantic literature; introduction to themes, genres, history, and culture of Romanticism.

Eng 343U - Romanticism (4)
Selected works of Romantic literature; introduction to themes, genres, history, and culture of Romanticism.

Eng 344 - Victorian Literature (4)
Selected works of Victorian literature; introduction to themes, genres, history and culture of the Victorian Era.

Eng 344U - Victorian Literature (4)
Selected works of Victorian literature; introduction to themes, genres, history and culture of the Victorian Era.

Eng 345 - Modern British Literature (4)
Selected works of British literature; introduction to themes, genres, history, and culture of modernism.

Eng 345U - Modern British Literature (4)
Selected works of British literature; introduction to themes, genres, history, and culture of modernism.

Eng 351 - African American Literature (4)
A study of African American literature from its oral and folk beginnings to the present. This is the first course in a sequence of three: Eng 351, Eng 352, and Eng 353. This is the same course as BSt 351 and may be taken only once for credit.

Crosslisted as: BSt 351U.

Eng 352 - African American Literature (4)
A study of African American literature from its oral and folk beginnings to the present. This is the second course in a sequence of three: Eng 351, Eng 352, and Eng 353. This is the same course as BSt 352 and may be taken only once for credit.

Crosslisted as: BSt 352.

Eng 352U - African American Literature (4)
A study of African American literature from its oral and folk beginnings to the present. This is the second course in a sequence of three: Eng 351, Eng 352, and Eng 353. This is the same course as BSt 352 and may be taken only once for credit.

Crosslisted as: BSt 352U.

Eng 353 - African American Literature (4)
A study of African American literature from its oral and folk beginnings to the present. This is the third course in a sequence of three: Eng 351, Eng 352, and Eng 353.

Eng 353U - African American Literature (4)
A study of African American literature from its oral and folk beginnings to the present. This is the third course in a sequence of three: Eng 351, Eng 352, and Eng 353.

Eng 360 - American Literature to 1865 (4)
Overview of genres, themes, and styles in the literatures of Early America and of the Early Republic.

Eng 360U - American Literature to 1865 (4)
Overview of genres, themes, and styles in the literatures of Early America and of the Early Republic.

Eng 363 - American Literature 1865-1965 (4)
Historical study of selected figures and movements in American literature from 1865 to 1965.

Eng 363U - American Literature 1865-1965 (4)
Historical study of selected figures and movements in American literature from 1865 to 1965.
Eng 364 - American Fiction I (4)
Historical study of selected figures and movements in American literature from 1865 to 1965. This is the first course in a sequence of three: Eng 364, Eng 365, and Eng 366.

Eng 365 - American Fiction II (4)
Historical study of selected figures and movements in American literature from 1865 to 1965. This is the second course in a sequence of three: Eng 364, Eng 365, and Eng 366.

Eng 366 - American Fiction (4)
Historical study of selected figures and movements in American literature from 1865 to 1965. This is the third course in a sequence of three: Eng 364, Eng 365, and Eng 366.

Eng 367 - American Literature and Culture (4)
Studies of various American literatures within the context of American history and culture from colonial period to the present. May be repeated with different topics: maximum of 8 hours.
Prerequisite: 12 credits in literature.

Eng 367U - American Literature and Culture (4)
Studies of various American literatures within the context of American history and culture from colonial period to the present. May be repeated with different topics: maximum of 8 hours.
Prerequisite: 12 credits in literature.

Eng 368 - Literature and Ecology (4)
Study of the role literature and language play in shaping cultural responses to the nonhuman world.

Eng 368U - Literature and Ecology (4)
Study of the role literature and language play in shaping cultural responses to the nonhuman world.

Eng 369 - Asian-American Literature (4)
Survey of significant texts and contexts of Asian-American culture.

Eng 369U - Asian-American Literature (4)
Survey of significant texts and contexts of Asian-American culture.

Eng 371 - The Novel (4)
The novel as a literary form, exemplified by works written in languages other than English.

Eng 372 - Topics in Literature, Gender, and Sexuality (4)
Study of representations of gender and sexuality in literature and related cultural forms. May be repeated for credit with different topics. This is the same course as WS 372 and may be taken only once for credit.
Crosslisted as: WS 372.

Eng 372U - Topics in Literature, Gender, and Sexuality (4)
Study of representations of gender and sexuality in literature and related cultural forms. May be repeated for credit with different topics. This is the same course as WS 372 and may be taken only once for credit.
Crosslisted as: WS 372U.

Eng 373 - Topics in Literature, Race, and Ethnicity (4)
Study of representations of racial and ethnic identity in literature and related cultural forms. May be repeated for credit with different topics.

Eng 384 - Contemporary Literature (4)
Prose, poetry, and drama from contemporary world literatures. This is the first course in a sequence of two: Eng 384 and Eng 385.

Eng 385 - Contemporary Literature (4)
Prose, poetry, and drama from contemporary world literatures. This is the second course in a sequence of two: Eng 384 and Eng 385.

Eng 387 - Women’s Literature (4)
A close study of writing by women from the medieval period to the present including poetry, drama, fiction and non-fiction.

Eng 387U - Women’s Literature (4)
A close study of writing by women from the medieval period to the present including poetry, drama, fiction and non-fiction.

Eng 399 - Special Studies (1-5)
See department for course description. (Credit to be arranged.)

Eng 401 - Research (0-6)
See department for course description. (Credit to be arranged.)

Eng 402 - Independent Study (1-12)
(Credit to be arranged.)

Eng 404 - Cooperative Education/Internship (0-12)
See department for course description. (Credit to be arranged.)

Eng 405 - Reading and Conference (0-6)
Consent of instructor. See department for course description. (Credit to be arranged.)

Eng 407 - Seminar (1-6)
Consent of instructor. See department for course description. (Credit to be arranged.)

Eng 408 - Workshop (0-6)
See department for course description. (Credit to be arranged.)

Eng 409 - Practicum (0-12)
See department for course description. (Credit to be arranged.)

Eng 410 - Selected Topics (1-6)
See department for course description. (Credit to be arranged.)

Eng 411 - English Drama (4)
Development of English drama from the beginnings to Shaw. Eng 411/511, from liturgical drama through the Renaissance; Eng 412/512, from the Restoration to Shaw. This is the first course in a sequence of two: Eng 411 and Eng 412. Also offered for graduate-level credit as Eng 511 and may be taken only once for credit.
Prerequisite: Eng 300. Expected preparation: 8 additional upper division Literature credits.

Eng 412 - English Drama (4)
Development of English drama from the beginnings to Shaw. Eng 411/511, from liturgical drama through the Renaissance;
Eng 412/512, from the Restoration to Shaw. This is the second course in a sequence of two: Eng 411 and Eng 412. Also offered for graduate-level credit as Eng 512 and may be taken only once for credit.

Prerequisite: Eng 300. Expected preparation: 8 additional upper division Literature credits.

Eng 413 - Teaching and Tutoring Writing (4)
Examines current practices of tutoring and teaching writing in all subject areas. Focuses on the process theory of writing to foster thinking and learning in subject areas and the problems and issues surrounding individual composing. Also offered for graduate-level credit as Eng 513 and may be taken only once for credit.

Prerequisite: Eng 300.

Eng 414 - Contemporary Composition Theories (4)
Examines theories of composition as they conflict and converge to form our prevailing theories of writing. Focuses on contemporary theories of composing written discourse. Also offered for graduate-level credit as Eng 514 and may be taken only once for credit.

Prerequisite: Eng 300. Expected preparation: 8 additional upper division Literature credits.

Eng 415 - Research Methods in Rhetoric and Composition (4)
Examines current methodologies used in the field of composition and asks students to design and implement a research project which will add to the cumulative knowledge of the discipline. It serves as the foundation course in design and implementation of qualitative research. Also offered for graduate-level credit as Eng 515 and may be taken only once for credit.

Prerequisite: Eng 300. Expected preparation: 8 additional upper division Literature credits.

Eng 416 - History of Rhetoric (4)
Major figures and movements in rhetoric from classical rhetoric to the present. Also offered for graduate-level credit as Eng 516 and may be taken only once for credit.

Prerequisite: junior standing.

Eng 420 - Caribbean Literature (4)
A selection of poetry and fiction from the English and French speaking Caribbean (in translation where necessary). Also offered for graduate-level credit as Eng 520 and may be taken only once for credit.

Recommended: One previous African American literature course and 12 additional literature credits.

Eng 421 - African Fiction (4)
Readings in African fiction in regional, cultural, generational, and gender contexts. This is the first course in a sequence of two: Eng 421 and Eng 422. Also offered for graduate-level credit as Eng 521 and may be taken only once for credit. Recommended prerequisites: One previous African American literature course and 12 additional literature credits.

Eng 422 - African Fiction (4)
Readings in African fiction in regional, cultural, generational, and gender contexts. This is the second course in a sequence of two: Eng 421 and Eng 422. Also offered for graduate-level credit as Eng 522 and may be taken only once for credit. Recommended prerequisites: One previous African American literature course and 12 additional literature credits.

Eng 425 - Practical Grammar (4)
Designed to enable students to understand, and therefore consciously to make effective, the structures of their written sentences. The course examines grammatical categories, structures, and terminology; relationships between grammatical structures and punctuation; and prescriptive grammars for written texts. Also offered for graduate-level credit as Eng 525 and may be taken only once for credit.

Prerequisite: Eng 300. Expected preparation: 4 upper division Literature/Writing credits.

Eng 426 - Advanced Topics in Medieval Literature (4)
Specialized studies in Medieval English literature (c. 800-1500). Topics courses are designed to follow a two-quarter sequence: (1) Anglo-Saxon works, and the exegetical reading model; some later Middle English and continental vernacular and Latin medieval works are included and (2) later medieval works (1200-1500), focusing primarily on the Middle English vernacular tradition. Students will have some opportunity to learn to read Old and Middle English. Also offered for graduate-level credit as Eng 526.

Prerequisite: Eng 300. Expected preparation: Eng 340 and 4 additional upper division Literature credits.

Eng 430 - Sixteenth Century Literature (4)
Specialized studies in Renaissance English literature. Topics include individual writers and literary groups; sixteenth-century poetry and prose; the English sonnet; the Renaissance epic and pastoral traditions; Elizabethan drama, verse narrative, satire, and invective; humanism; the rise of the professional writer; literature and the visual arts. Also offered for graduate-level credit as Eng 530.

Prerequisite: Eng 300. Expected preparation: Eng 341 and 4 additional upper division Literature credits.

Eng 435 - Advanced Topics in Film and Media (4)
Specialized studies in the history, criticism, or theory of film and media culture. Topics may focus on genres, movements, figures, theoretical issues, or advanced historical topics. Also offered for graduate-level credit as Eng 535.

Prerequisite: Eng 300 or Eng 304.

Eng 440 - Advanced Topics in Seventeenth Century Literature (4)
Specialized studies in seventeenth-century literature. Topics include cavalier and metaphysical poetry; revenge tragedy; prose forms of the early seventeenth century; popular genres of the English civil war; women writers; and restoration drama. Also offered for graduate-level credit as Eng 540 and may be taken only once for credit.

Prerequisite: Eng 300. Expected preparation: Eng 341 or Eng 342 and 4 additional upper division Literature credits.

Eng 441 - Advanced Topics in Renaissance Culture (4)
Advanced topics in early modern (1500-1700) cultural studies, focusing on issues of religion, social class, ethnicity, gender, and sexuality and studying both literary and non-literary texts. Course may be repeated for credit with different topics. Also offered for graduate-level credit as Eng 541 and may be taken only once for credit.
Prerequisite: Eng 300. Expected preparation: Eng 341 and 4 additional upper division Literature credits.

**Eng 443 - British Women Writers (4)**

Study of the works of British women writers with attention to themes, styles, and characteristic concerns in the light of feminist criticism and scholarship. This is the first course in a sequence of two: Eng 443 and Eng 444. Also offered for graduate-level credit as Eng 543 and may be taken only once for credit.

Prerequisite: Eng 300. Expected preparation: Eng 387 and 4 additional upper division Literature credits.

**Eng 444 - British Women Writers (4)**

Study of the works of British women writers with attention to themes, styles, and characteristic concerns in the light of feminist criticism and scholarship. This is the second course in a sequence of two: Eng 443 and Eng 444. Also offered for graduate-level credit as Eng 544 and may be taken only once for credit.

Prerequisite: Eng 300. Expected preparation: Eng 387 and 4 additional upper division Literature credits.

**Eng 445 - American Women Writers: 19th Century (4)**

Study of American women writers, with attention to themes, styles, and characteristic concerns, in the light of feminist criticism and scholarship. Also offered for graduate-level credit as Eng 545 and may be taken only once for credit.

Prerequisite: Eng 300. Expected preparation: Eng 387 and 4 additional upper division Literature credits.

**Eng 446 - American Women Writers: 20th Century (4)**

Study of American women writers, with attention to themes, styles, and characteristic concerns, in the light of feminist criticism and scholarship. Also offered for graduate-level credit as Eng 546 and may be taken only once for credit.

Prerequisite: Eng 300. Expected preparation: Eng 387 and 4 additional upper division Literature credits.

**Eng 447 - Major Forces in Literature (4)**

A study of literary forms, theories, and movements: i.e., The Comic Novel, Literature and Theology, Southern American Women Writers. Also offered for graduate-level credit as Eng 547.

Prerequisite: Eng 300. Expected preparation: 8 additional upper division Literature credits.

**Eng 448 - Major Figures in Literature (4)**

Concentrated study of the canon of one or more major writers: for example, Chaucer, The Brontes, James Joyce, Hemingway and Fitzgerald. Also offered for graduate-level credit as Eng 548.

Prerequisite: Eng 300. Expected preparation: 8 additional upper division Literature credits.

**Eng 449 - Advanced Topics in Cultural Studies (4)**

Interdisciplinary study of modern culture and media. The courses offered under this number use a range of theoretical approaches to analyze the role of cultural texts, their production and reception. Specific topics include: Major Figures/Concepts in Social Theory; Politics of Consumer Culture; Globalization and American Culture; and Culture, Gender, Race, Sexuality. Also offered for graduate-level credit as Eng 549. Course may be repeated with different topics.

Prerequisite: Eng 300. Expected preparation: 8 additional upper division Literature credits.

**Eng 450 - Advanced Topics in American Literature to 1800 (4)**

Advanced historical study of major figures and movements in American literature to 1865. Course may be repeated for credit with different topics. Also offered for graduate-level credit as Eng 560.

Prerequisite: Eng 300. Expected preparation: Eng 444. Also offered for graduate-level credit as Eng 550.

**Eng 451 - Topics: American Literature to 1800 (4)**

Study of themes, genres, history, and culture in 19th century American literature. Topics: sentimental literature, immigrant literature, post-Civil War literature, imperial adventures, minority literatures in 19th century American literature. For offerings for a particular term, consult the University schedule, the English Department website and/or an adviser. May be repeated with different topics: maximum of 8 hours to be applied to master's degree. Also offered for graduate-level credit as Eng 561.

Prerequisite: Eng 300. Expected preparation: Eng 342 and 4 additional upper division Literature credits.

**Eng 452 - American Literature: 20th Century (4)**

Study of themes, genres, history, and culture in 20th century American literature. Topics: Cold War literature, the 1930's, new immigrant fiction, literature of exile, suburban representations. For offerings for a particular term, consult the University schedule, the English Department website and/or an adviser. May be repeated with different topics: maximum of 8 hours to be applied to master's degree. Also offered for graduate-level credit as Eng 564.
Prerequisite: Eng 300. Expected preparation: Eng 363 and 4 additional upper division Literature credits.

Eng 467 - Advanced Topics: American Literature and Culture (4)
Interdisciplinary thematic studies of American literature and culture. Course may be repeated with different topics: maximum of 8 credits to be applied to master's degree. Also offered for graduate-level credit as Eng 567.
Prerequisite: Eng 300. Expected preparation: 8 additional upper division Literature credits.

Eng 467H - Eng 468 - American Literature and Culture (4)
Studies based on primary sources of American literature and culture from European contact to the present. The approach is thematic rather than chronological. Recommended prerequisite: 12 credits in literature.

Eng 469 - Advanced Topics in Asian-American Literature and Culture (4)
Readings in Asian-American literature and culture in generational, national, international, and gendered contexts. Topics will include gender and sexuality in Asian-American literature and film; transnational Asian-American narrative; Asian North American literature. Also offered for graduate-level credit as Eng 569.
Prerequisite: Eng 300. Expected preparation: Eng 369 and 4 additional upper division Literature credits.

Eng 475 - Advanced Topics in Victorian Literature (4)
Specialized studies of Victorian literature in the context of the history, ideas, and culture of the period. Topics include individual writers and literary movements such as Dickens; pre-Raphaelitism; literature of the industrial period. Course may be repeated for credit with different topics. Also offered for graduate-level credit as Eng 575.
Prerequisite: Eng 300. Expected preparation: Eng 344 and 4 additional upper division Literature credits.

Eng 477 - American Poetry (4)
Tradition and innovation in American poetry from the beginnings to the mid-20th century. This is the first course in a sequence of two: Eng 477 and Eng 478. Also offered for graduate-level credit as Eng 577 and may be taken only once for credit.
Prerequisite: Eng 300. Expected preparation: 8 additional upper division Literature credits.

Eng 478 - American Poetry (4)
Tradition and innovation in American poetry from the beginnings to the mid-20th century. This is the second course in a sequence of two: Eng 477 and Eng 478. Also offered for graduate-level credit as Eng 578 and may be taken only once for credit.
Prerequisite: Eng 300. Expected preparation: 8 additional upper division Literature credits.

Eng 480 - Advanced Topics in Twentieth Century British Literature (4)
Specialized studies in twentieth-century British literature. Topics include individual writers and literary groups; poetry, prose, and fiction; theories of modernism; technology, politics, propaganda, and the arts; literature and twentieth-century philosophy. Course may be repeated for credit with different topics. Also offered for graduate-level credit as Eng 580.
Prerequisite: Eng 300. Expected preparation: Eng 345 and 4 additional upper division Literature credits.

Eng 484 - Modern Drama (4)
Examines major European, English, and American plays in the period 1880-1940. Also offered for graduate-level credit as Eng 584 and may be taken only once for credit.
Prerequisite: Eng 300. Expected preparation: 8 additional upper division Literature credits.

Eng 485 - Contemporary Drama (4)
Examines major developments in world drama since World War II. Also offered for graduate-level credit as Eng 585 and may be taken only once for credit.
Prerequisite: Eng 300. Expected preparation: 8 additional upper division Literature credits.

Eng 486 - Contemporary American Novel (4)
American novel since 1965, with emphasis upon traditions, themes and trends. Also offered for graduate-level credit as Eng 586 and may be taken only once for credit.
Prerequisite: Eng 300. Expected preparation: 8 additional upper division Literature credits.

Eng 487 - Contemporary American Short Story (4)
The American short story from mid-20th century to the present. Also offered for graduate-level credit as Eng 587 and may be taken only once for credit.
Prerequisite: Eng 300. Expected preparation: 8 additional upper division Literature credits.

Eng 488 - Contemporary American Poetry (4)
Study of significant trends in contemporary American poetry and poetics. Also offered for graduate-level credit as Eng 588 and may be taken only once for credit.
Prerequisite: Eng 300. Expected preparation: 8 additional upper division Literature credits.

Eng 490 - Advanced Topics in Rhetoric and Composition Studies (4)
Examines particular figures, theories, issues, movements, and historical-cultural contexts in in both contemporary and historical studies in rhetoric and composition. May be repeated for credit with different topics. Also offered for graduate-level credit as Eng 590.
Prerequisite: Eng 300. Expected preparation: 8 adviser-approved credits in literature, philosophy, speech, and/or writing.

Eng 491 - History of Literary Criticism and Theory I (4)
Examines the history of Western critical approaches to language and literature from ancient traditions through the Enlightenment. Also offered for graduate-level credit as Eng 591 and may be taken only once for credit.
Prerequisite: Eng 300. Expected preparation: 8 upper-division credits in literature.

Eng 492 - History of Literary Criticism and Theory II (4)
Examines the history of Western critical approaches to language and literature from the mid-nineteenth century to the present. Also offered for graduate-level credit as Eng 592 and may be taken only once for credit.
Prerequisite: Eng 300. Expected preparation: 8 upper-division credits in literature.
Eng 493 - Advanced Topics in Feminist Literary Theory (4)
Provides in-depth study of specific critical schools within the larger arena of feminist theory. Possible topics will include post colonialism and feminism; feminism and the body; historical perspectives on feminism. Course may be repeated for credit with different topics. Also offered for graduate-level credit as Eng 593.
Prerequisite: Eng 300. Expected preparation: Eng 492 and 4 additional upper division Literature credits.

Eng 494 - Topics in Critical Theory and Methods (4)
A course in critical theories and techniques, to complement offerings in literary history and textual analysis. This course will focus on the critical or methodological topic selected by the instructor. Recommended for advanced students in literature and theory. Recommended: 12 credits in literature. Course may be repeated for credit with different topics. Also offered for graduate-level credit as Eng 594.
Prerequisite: Eng 300. Expected preparation: Eng 492 and 4 additional upper division Literature credits.

Eng 494H -

Eng 498 - Ecology, Criticism, and Culture (4)
Examines ecological perspectives on the study of literature, culture, and critical theory, as well as how the methods of literary and cultural studies illuminate environmental issues and problems of sustainability. Also offered for graduate-level credit as Eng 598 and may be taken only once for credit.
Prerequisite: Eng 300.

Eng 492 and 4 additional upper division Literature credits.

Eng 499 - Independent Study (1-6)
(Credit to be arranged.)

Eng 504 - Cooperative Education/Internship (0-9)
See department for course description. (Credit to be arranged.)

Eng 505 - Reading and Conference (0-9)
Consent of instructor. See department for course description. (Credit to be arranged.)

Eng 507 - Seminar (1-6)
Variable topics. Graduate only or consent of instructor. At least one Eng 507 seminar is required of M.A. candidates in English. (Credit to be arranged.)

Eng 508 - Workshop (0-6)
See department for course description. (Credit to be arranged.)

Eng 509 - Practicum (0-9)
See department for course description. (Credit to be arranged.)

Eng 510 - Selected Topics (1-6)
See department for course description. (Credit to be arranged.)

Eng 511 - English Drama (4)
Development of English drama from the beginnings to Shaw. Eng 411/511, from liturgical drama through the Renaissance; Eng 412/512, from the Restoration to Shaw. This is the first course in a sequence of two: Eng 511 and Eng 512. Also offered for undergraduate-level credit as Eng 411 and may be taken only once for credit.
Prerequisite: Eng 300. Expected preparation: 8 additional upper division Literature credits.

Eng 512 - English Drama (4)
Development of English drama from the beginnings to Shaw. Eng 411/511, from liturgical drama through the Renaissance; Eng 412/512, from the Restoration to Shaw. This is the second course in a sequence of two: Eng 511 and Eng 512. Also offered for undergraduate-level credit as Eng 512 and may be taken only once for credit.
Prerequisite: Eng 300. Expected preparation: 8 additional upper division Literature credits.

Eng 513 - Teaching and Tutoring Writing (4)
Examines current practices of tutoring and teaching writing in all subject areas. Focuses on the process theory of writing to foster thinking and learning in subject areas and the problems and issues surrounding individual composing. Also offered for undergraduate-level credit as Eng 413 and may be taken only once for credit.
Prerequisite: Eng 300.

Eng 514 - Contemporary Composition Theories (4)
Examines theories of composition as they conflict and converge to form our prevailing theories of writing. Focuses on contemporary theories of composing written discourse. Also offered for undergraduate-level credit as Eng 414 and may be taken only once for credit.
Prerequisite: Eng 300. Expected preparation: 8 additional upper division Literature credits.

Eng 515 - Research Methods in Rhetoric and Composition (4)
Examines current methodologies used in the field of composition and asks students to design and implement a research project which will add to the cumulative knowledge of the discipline. It serves as the foundation course in design and implementation of qualitative research. Also offered for undergraduate-level credit as Eng 415 and may be taken only once for credit.
Prerequisite: Eng 300. Expected preparation: 8 additional upper division Literature credits.

Eng 516 - History of Rhetoric (4)
Major figures and movements in rhetoric from classical rhetoric to the present. Also offered for undergraduate-level credit as Eng 416 and may be taken only once for credit.
Prerequisite: junior standing.

Eng 517 - Middle English (4)
Introduction to Middle English language through study of (largely non-Chaucerian) 12th to 15th century literature in the original. Graduate only or consent of instructor.

Eng 518 - College Composition Teaching (1)
Introduces and develops the theoretical and practical expertise of the graduate teaching assistant in the area of college composition.
teaching. May be taken up to three times for credit.

Prerequisite: appointment to teaching assistantship in English Department.

Eng 519 - Advanced College Composition Teaching (1)
Continues the development of the theoretical and practical expertise of the graduate teaching assistant in advanced areas of college composition teaching. May be repeated up to three times for credit. Required prerequisite: appointment to 2nd year teaching assistantship in English Department.

Eng 520 - Caribbean Literature (4)
A selection of poetry and fiction from the English and French speaking Caribbean (in translation where necessary). Also offered for undergraduate-level credit as Eng 420 and may be taken only once for credit. Recommended: One previous African American literature course and 12 additional literature credits.

Eng 521 - African Fiction (4)
Readings in African fiction in regional, cultural, generational, and gender contexts. This is the second course in a sequence of two: Eng 521 and Eng 522. Also offered for undergraduate-level credit as Eng 421 and may be taken only once for credit. Recommended prerequisites: One previous African American literature course and 12 additional literature credits.

Eng 522 - African Fiction (4)
Readings in African fiction in regional, cultural, generational, and gender contexts. This is the second course in a sequence of two: Eng 421 and Eng 422. Also offered for undergraduate-level credit as Eng 422 and may be taken only once for credit. Recommended prerequisites: One previous African American literature course and 12 additional literature credits.

Eng 525 - Practical Grammar (4)
Designed to enable students to understand, and therefore consciously to make effective, the structures of their written sentences. The course examines grammatical categories, structures, and terminology; relationships between grammatical structures and punctuation; and prescriptive grammars for written texts. Also offered for undergraduate-level credit as Eng 425 and may be taken only once for credit.

Prerequisite: Eng 300. Expected preparation: 4 upper division Literature/Writing credits.

Eng 526 - Advanced Topics in Medieval Literature (4)
Specialized studies in Medieval English literature (c. 800-1500). Topics are designed to follow a two-quarter sequence: (1) Anglo-Saxon works, and the exegetical reading model; some later Middle English and continental vernacular and Latin medieval works are included and (2) later medieval works (1200-1500), focusing primarily on the Middle English vernacular tradition. Students will have some opportunity to learn to read Old and Middle English. Also offered for undergraduate-level credit as Eng 426.

Prerequisite: Eng 300. Expected preparation: Eng 430 and 4 additional upper division Literature credits.

Eng 530 - Sixteenth Century Literature (4)
Specialized studies in Renaissance English literature. Topics include individual writers and literary groups; sixteenth-century poetry and prose; the English sonnet; the Renaissance epic and pastoral traditions; Elizabethan drama, verse narrative, satire, and invective; humanism; the rise of the professional writer; literature and the visual arts. Also offered for undergraduate-level credit as Eng 430.

Prerequisite: Eng 300. Expected preparation: Eng 431 and 4 additional upper division Literature credits.

Eng 531 - Topics in English Studies (1)
Examines various theories, history, scholarship, pedagogy, and professional development in the field of English Studies. Topics always differ each term. May be repeated for up to six credits.

Eng 532 - Old English (4)
An introduction to the history and grammar of Old English. This is the first course in a sequence of three: Eng 532, Eng 533, and Eng 534. Recommended prerequisite: Eng 532 is prerequisite for Eng 533 or 534. Graduate only or consent of instructor.

Eng 533 - Old English (4)
An introduction to the history and grammar of Old English. This is the second course in a sequence of three: Eng 532, Eng 533, and Eng 534. Recommended prerequisite: Eng 532 is prerequisite for Eng 533 or 534. Graduate only or consent of instructor.

Eng 534 - Old English (4)
An introduction to the history and grammar of Old English. This is the third course in a sequence of three: Eng 532, Eng 533, and Eng 534. Recommended prerequisite: Eng 532 is prerequisite for Eng 533 or 534. Graduate only or consent of instructor.

Eng 535 - Advanced Topics in Film and Media (4)
Specialized studies in the history, criticism, or theory of film and media culture. Topics may focus on genres, movements, figures, theoretical issues, or advanced historical topics. Also offered for undergraduate credit as Eng 435.

Eng 540 - Advanced Topics in Seventeenth Century Literature (4)
Specialized studies in seventeenth-century literature. Topics include cavalier and metaphysical poetry; revenge tragedy; prose forms of the early seventeenth century; popular genres of the English civil war; women writers; and restoration drama. Also offered for undergraduate-level credit as Eng 440 and may be taken only once for credit.

Prerequisite: Eng 300. Expected preparation: Eng 341 or Eng 342 and 4 additional upper division Literature credits.

Eng 541 - Advanced Topics in Renaissance Culture (4)
Advanced topics in early modern (1500-1700) cultural studies, focusing on issues of religion, social class, ethnicity, gender, and sexuality and studying both literary and non-literary texts. Course may be repeated for credit with different topics. Also offered for undergraduate-level credit as Eng 441 and may be taken only once for credit.

Prerequisite: Eng 300. Expected preparation: Eng 341 and 4 additional upper division Literature credits.

Eng 543 - British Women Writers (4)
Study of the works of British women writers with attention to themes, styles, and
characteristic concerns in the light of feminist criticism and scholarship. This is the first course in a sequence of two: Eng 543 and Eng 544. Also offered for undergraduate-level credit as Eng 443 and may be taken only once for credit.

Prerequisite: Eng 300. Expected preparation: Eng 387 and 4 additional upper division Literature credits.

Eng 544 - British Women Writers (4)
Study of the works of British women writers with attention to themes, styles, and characteristic concerns in the light of feminist criticism and scholarship. This is the second course in a sequence of two: Eng 543 and Eng 544. Also offered for undergraduate-level credit as Eng 444 and may be taken only once for credit.

Prerequisite: Eng 300. Expected preparation: Eng 387 and 4 additional upper division Literature credits.

Eng 545 - American Women Writers: 19th Century (4)
Study of American women writers, with attention to themes, styles, and characteristic concerns, in the light of feminist criticism and scholarship. Also offered for undergraduate-level credit as Eng 445 and may be taken only once for credit.

Prerequisite: Eng 300. Expected preparation: Eng 387 and 4 additional upper division Literature credits.

Eng 546 - American Women Writers: 20th Century (4)
Study of American women writers, with attention to themes, styles, and characteristic concerns, in the light of feminist criticism and scholarship. Also offered for undergraduate-level credit as Eng 446 and may be taken only once for credit.

Prerequisite: Eng 300. Expected preparation: Eng 387 and 4 additional upper division Literature credits.

Eng 547 - Major Forces in Literature (4)
A study of literary forms, theories, and movements: i.e., The Comic Novel, Literature and Theology, Southern American Women Writers. Also offered for undergraduate-level credit as Eng 447.

Prerequisite: Eng 300. Expected preparation: 8 additional upper division Literature credits.

Eng 548 - Major Figures in Literature (4)
Concentrated study of the canon of one or more major writers: for example, Chaucer, The Brontes, James Joyce, Hemingway and Fitzgerald. Also offered for undergraduate-level credit as Eng 448.

Prerequisite: Eng 300. Expected preparation: 8 additional upper division Literature credits.

Eng 549 - Advanced Topics in Cultural Studies (4)
Interdisciplinary study of modern culture and media. The courses offered under this number use a range of theoretical approaches to analyze the role of cultural texts, their production and reception. Specific topics include: Major Figures/Concepts in Social Theory; Politics of Consumer Culture; Globalization and American Culture; and Culture, Gender, Race, Sexuality. Also offered for undergraduate-level credit as Eng 449.

Course may be repeated with different topics.

Prerequisite: Eng 300. Expected preparation: 8 additional upper division Literature credits.

Eng 550 - Advanced Topics in Eighteenth Century Literature (4)
Specialized studies in British poetry and prose from 1660-1800. Topics include survey of eighteenth-century literature; individual writers and literary groups; prose and verse satire; epistolary fiction; drama. Also offered for undergraduate-level credit as Eng 450.

Prerequisite: Eng 300. Expected preparation: Eng 342 and 4 additional upper division Literature credits.

Eng 551 - Advanced Topics in Nineteenth Century Literature (4)
Specialized studies in the literature of the Romantic movement in Britain and continental Europe. Topics include individual writers and literary groups; poetry and poetic theory; gothic fiction; romanticism and the novel; autobiographical and confessional literature; aesthetic ideologies; women and romanticism; revolutionary and imperialist aspects of romanticism; the impact of romanticism on later literary movements (such as symbolism and modernism). Also offered for undergraduate-level credit as Eng 458.

Prerequisite: Eng 300. Expected preparation: Eng 342 and 4 additional upper division Literature credits.

Eng 552 - Advanced Topics in American Literature to 1800 (4)
Advanced historical study of major figures and movements in American literature to 1865. Course may be repeated for credit with different topics. Also offered for undergraduate-level credit as Eng 460.

Prerequisite: Eng 300. Expected preparation: Eng 360 and 4 additional upper division Literature credits.

Eng 553 - Advanced Topics in American Literature to 1900 (4)
Study of themes, genres, history, and culture in 19th century American literature: Topics: sentimental literature, immigrant literature, post- Civil War literature, imperial adventures, minority literatures in 19th century American literature. For offerings for a particular term, consult the University schedule, the English Department website and/or an adviser. May be repeated with different topics: maximum of 8 hours to be applied to master’s degree. Also offered for undergraduate-level credit as Eng 461.

Prerequisite: Eng 300. Expected preparation: Eng 360 and/or 363 and 4 additional upper division Literature credits.

Eng 554 - American Literature: 20th Century (4)
Study of themes, genres, history, and culture in 20th century American literature: Topics: Cold War literature, the 1930’s, new immigrant fiction, literature of exile, suburban representations. For offerings for a particular term, consult the University schedule, the English Department website and/or an adviser. May be repeated with different topics: maximum of 8 hours to be applied to master’s degree. Also offered for undergraduate-level credit as Eng 464.

Prerequisite: Eng 300. Expected preparation: Eng 363 and 4 additional upper division Literature credits.

Eng 555 - Advanced Topics in Modernism (4)
Specialized studies in literature of the Modernist movement in Britain and continental Europe. Topics include individual writers and literary groups; poetry and poetic theory; gothic fiction; romanticism and the novel; autobiographical and confessional literature; aesthetic ideologies; women and romanticism; revolutionary and imperialist aspects of romanticism; the impact of romanticism on later literary movements (such as symbolism and modernism). Also offered for undergraduate-level credit as Eng 458.

Prerequisite: Eng 300. Expected preparation: Eng 342 and 4 additional upper division Literature credits.

Eng 556 - Advanced Topics in American Literature and Culture (4)
Interdisciplinary thematic studies of American literature and culture. Course may be repeated with different topics: maximum of 8 credits to be applied to master's degree.
Also offered for undergraduate-level credit as Eng 467.

Prerequisite: Eng 300. Expected preparation: 8 additional upper division Literature credits.

**Eng 568 - American Literature and Culture (4)**

Studies based on primary sources of American literature and culture from European contact to the present. The approach is thematic rather than chronological. Recommended prerequisite: 12 credits in literature.

**Eng 569 - Advanced Topics in Asian-American Literature and Culture (4)**

Readings in Asian-American literature and culture in generational, national, international, and gendered contexts. Topics will include gender and sexuality in Asian-American literature and film; transnational Asian-American narrative; Asian North American literature. Also offered for undergraduate-level credit as Eng 469.

Prerequisite: Eng 300. Expected preparation: Eng 369 and 4 additional upper division Literature credits.

**Eng 575 - Advanced Topics in Victorian Literature (4)**

Specialized studies of Victorian literature in the context of the history, ideas, and culture of the period. Topics include individual writers and literary movements such as Dickens; pre-Raphaelitism; literature of the industrial period. Course may be repeated for credit with different topics. Also offered for undergraduate-level credit as Eng 475.

Prerequisite: Eng 300. Expected preparation: Eng 344 and 4 additional upper division Literature credits.

**Eng 577 - American Poetry (4)**

Tradition and innovation in American poetry from the beginnings to the mid-20th century. This is the first course in a sequence of two: Eng 577 and Eng 578. Also offered for undergraduate-level credit as Eng 478 and may be taken only once for credit.

Prerequisite: Eng 300. Expected preparation: 8 additional upper division Literature credits.

**Eng 578 - American Poetry (4)**

Tradition and innovation in American poetry from the beginnings to the mid-20th century. This is the second course in a sequence of two: Eng 577 and Eng 578. Also offered for undergraduate-level credit as Eng 478 and may be taken only once for credit.

Prerequisite: Eng 300. Expected preparation: 8 additional upper division Literature credits.

**Eng 580 - Advanced Topics in Twentieth Century British Literature (4)**

Specialized studies in twentieth-century British literature. Topics include individual writers and literary groups; poetry, prose, and fiction; theories of modernism; technology, politics, propaganda, and the arts; literature and twentieth-century philosophy. Course may be repeated for credit with different topics. Also offered for undergraduate-level credit as Eng 480.

Prerequisite: Eng 300. Expected preparation: Eng 345 and 4 additional upper division Literature credits.

**Eng 584 - Modern Drama (4)**

Examines major European, English, and American plays in the period 1880-1940. Also offered for undergraduate-level credit as Eng 484 and may be taken only once for credit.

Prerequisite: Eng 300. Expected preparation: 8 additional upper division Literature credits.

**Eng 585 - Contemporary Drama (4)**

Examines major developments in world drama since World War II. Also offered for undergraduate-level credit as Eng 485 and may be taken only once for credit.

Prerequisite: Eng 300. Expected preparation: 8 additional upper division Literature credits.

**Eng 586 - Contemporary American Novel (4)**

American novel since 1965, with emphasis upon traditions, themes and trends. Also offered for undergraduate-level credit as Eng 486 and may be taken only once for credit.

Prerequisite: Eng 300. Expected preparation: 8 additional upper division Literature credits.

**Eng 587 - Contemporary American Short Story (4)**

The American short story from mid-20th century to the present. Also offered for undergraduate-level credit as Eng 487 and may be taken only once for credit.

Prerequisite: Eng 300. Expected preparation: 8 additional upper division Literature credits.
ESM 101L - Lab for Environmental Sciences I (0)
Lab for ESM 101 Environmental Science.
Corequisite: ESM 101.

ESM 102 - Environmental Sciences II (4)
Introduction to the analytical study of the interaction between humans and the environment. This term will focus on issues of environmental degradation. Topics will include human population growth, pollution of the air and water, energy resource use, and social and economic basis for sustainability. One 2-hour laboratory. The laboratory projects will focus on impact of population growth, pollution, and resource conservation.
Corequisite: ESM 102L.

ESM 102L - Lab for Environmental Sciences II (0)
Lab for Environmental Sciences II
Corequisite: ESM 102.

ESM 150 - Orientation to Environmental Sciences and Management (1)
Self-paced online orientation that covers: virtual tour of PSU and ESM facilities, surveys of the two degrees, pre-requisite courses, UNST or Honors, Career Center, graduate programs, internships, creating a portfolio, student interviews, and steps to getting started.

ESM 199 - Special Studies (1-9)
See department for course description. (Credit to be arranged.)

ESM 220 - Introduction to Environmental Systems (4)
Introduction to the structure and function of terrestrial, aquatic, and atmospheric systems, including the human actions that affect them. Includes a lab section that introduces basic quantitative techniques for collecting and analyzing data from environmental systems; 2 lecture periods, one 3-hour lab. Expected preparation: Stat 243 (may be taken concurrently).
Corequisite: ESM 220L.

ESM 220L - Introduction to Environmental Systems Lab (0)
Lab for ESM 220 Introduction to Environmental Systems.
chemistry, toxicological chemistry and industrial ecology. Examples will be used that illustrate the social and economic importance of environmental chemistry. This is the second course in a sequence of two: ESM 230 and ESM 231 and must be taken in sequence.

Prerequisite: ESM 230.

**ESM 320 - Analysis of Environmental Systems I (4)**

Structure and function of environmental systems, with an emphasis on physical processes and environmental system dynamics. Includes a laboratory section using quantitative techniques for conceptualizing and analyzing environmental processes; 3 hours lecture, one 3-hour lab. Recommended prerequisites: Mth 241 or 251, and four credits each in biology, chemistry, and physics or geology.

**ESM 321 - Analysis of Environmental Systems II (4)**

Introduction to the structure and function of environmental systems with an emphasis on ecological processes and human impacts. Includes a laboratory focusing on the use of quantitative techniques for whole system analysis; 3 hours lecture, one 3-hour lab. Recommended prerequisite: ESM 320.

Corequisite: ESM 324.

**ESM 322 - Environmental Risk Assessment (4)**

Overview of risk assessment applied to environmental problems, including the impact assessment process, application of cost-benefit analysis, hazard identification, risk characterization, risk assessment, and risk management. Recommended prerequisites: Ec 201, ESM 222, ESM 321.

**ESM 323 - Environmental Systems Laboratory I (2)**

Laboratory work to accompany Environmental Systems I (ESM 320). One 4-hour laboratory period. Requires concurrent enrollment in ESM 320.

**ESM 324 - Environmental Systems Laboratory II (2)**

Laboratory work to accompany Environmental Systems II (ESM 321). One 4-hour laboratory period. Requires concurrent enrollment in ESM 321.

Corequisite: ESM 321.

**ESM 325 - Environmental Risk Assessment Lab (2)**

Provides an overview of the main techniques used for environmental risk assessment. Emphasis is on laboratory acute and chronic toxicity tests and field biological stream assessment. Recommended prerequisites: ESM 321, 322, 324.

**ESM 330 - Environmental and Ecological Literacy (4)**

Introduces a broad range of thought about ecology and the environment, including supporters and critics such as Aldo Leopold, David Orr, Bjorn Lomborg, E.O. Wilson and Thomas Berry. Addresses the idea of ecological literacy as a key aspect in education and understanding the environment. Recommended prerequisites: ESM 220, 221, and 222.

**ESM 333 - Methods of Data Collection, Analysis, Representation, and Modeling for Environmental Managers (4)**

Overview and review of main techniques for collecting, modeling and analyzing both scientific and social data; key activities for environmental managers. Co-requisite: ESM 334.

Prerequisite: ESM 220, ESM 221, and ESM 222. Corequisite: ESM 334.

**ESM 334 - Methods of Data Collection, Analysis, Representation, and Modeling for Environmental Managers Lab (2)**

Lab accompanying the lecture class: ESM 333, provides practice and review of main techniques for collecting, modeling and analyzing both scientific and social data; key activities for environmental managers. Corequisite: ESM 333.

Corequisite: ESM 333.

**ESM 335 - Introduction to Environmental Management (4)**

Course will focus on environmental project management. Survey of agencies and entities that currently do management and under what authority. Introduction to general theory of environmental management and strategies that are being used. Case studies of local management project and issues.

Prerequisite: ESM 222.

**ESM 340 - Research Methods in Environmental Science (4)**

Integrates quantitative skills into environmental research. Introduces research methods commonly used in environmental studies with emphasis on environmental study designs, data analyses, and data interpretations.

**ESM 342 - Field Methods (2)**

Presents crucial safety, field and research skills for environmental research. Presents different skill sets for different types of field work for example in lakes, wetlands, forests or marine environments. Students may count two sections of this class toward an Environmental Science or Environmental Studies major. (May be taken twice).

**ESM 355 - Understanding Environmental Sustainability I (4)**

Emphasizing sustainability, study of the scientific and ecological principles that govern human interactions with the physical and biological systems of the earth. Topics will include ecosystem properties, earth system properties, human population dynamics, and the roles of technological and ethical decisions. Not intended for science majors.

**ESM 355U - Understanding Environmental Sustainability I (4)**

Emphasizing sustainability, study of the scientific and ecological principles that govern human interactions with the physical and biological systems of the earth. Topics will include ecosystem properties, earth system properties, human population dynamics, and the roles of technological and ethical decisions. Not intended for science majors.

**ESM 356 - Understanding Environmental Sustainability II (4)**

Introduction to the concepts and principles necessary to understand the complex relationship between humans and environmental sustainability. Topics will include natural resources issues with a focus on nature’s services, the global crisis in water, biodiversity, and food; soil function, the fate of environmental toxins and public health, climate change, alternative energy, as well as ethics, governance, regulatory compliance, and community understanding. Not intended for science majors. Expected preparation: UnSt 224 or ESM 355.
ESM 356U - Understanding Environmental Sustainability II (4)

Introduction to the concepts and principles necessary to understand the complex relationship between humans and environmental sustainability. Topics will include natural resources issues with a focus on nature’s services, the global crisis in water, biodiversity, and food; soil function, the fate of environmental toxins and public health, climate change, alternative energy, as well as ethics, governance, regulatory compliance, and community understanding. Not intended for science majors. Expected preparation: UnSt 224 or ESM 355.

ESM 357 - Business Solutions for Environmental Problems (4)

Environmental science perspectives and business perspectives on environmental issues, focusing on smaller scale problems amenable to entrepreneurial solutions. Contextualization and analysis of issues using approaches and tools from both disciplines in search of local, sustainable, cost and scale-effective approaches. This is the same course as BA 357 and may be taken only once for credit.

ESM 399 - Special Studies (1-9)

See department for course description. (Credit to be arranged.)

ESM 401 - Research (0-8)

Consent of instructor and program director. See department for course description. (Credit to be arranged.)

ESM 402 - Independent Study (1-12)

(Credit to be arranged.)

ESM 404 - Cooperative Ed/Internship (0-12)

See department for course description. (Credit to be arranged.)

ESM 405 - Reading and Conference (0-9)

See department for course description. (Credit to be arranged.)

ESM 406 - Special Projects (1-12)

(Credits to be arranged.)

ESM 407 - Environmental Sciences Seminar (0-6)

Weekly seminar series involving student-led discussion of topical environmental issues. May be repeated for up to 3 credits.

ESM 410 - Selected Topics (1-12)

Consent of instructor. See department for course description. (Credit to be arranged.)

ESM 416 - Ecosystem Restoration (4)

Ecological theories and principles that guide restoration practices in a variety of ecosystems, including rivers, wetlands, forests, and prairies. Causes of ecosystem degradation, motivations for restoration, and factors that influence success in restoration. Interactions between science, philosophy, engineering, environmental management, policy, and politics in the dynamic world of ecosystem restoration. Also offered for graduate-level credit as ESM 516 and may be taken only once for credit.

Prerequisite: ESM 335 or Geog 345 or BI 357 or ESM 321.

ESM 418 - Landscape Ecology (4)

Examines the structure, function, and change of natural and human-modified communities at the scale between individual communities and regional biomes. Focuses on spatial patterns and processes as they relate to the patch mosaic of interacting ecological communities. Expected preparation: Geog 313 or BI 357. Upper-division standing required. Also offered for graduate-level credit as ESM 518; this is the same course as Geog 418 and may be taken only once for credit.

Crosslisted as: Geog 418.

ESM 420 - Ecological Toxicology (4)

Effects of environmental contaminants at the individual, population, and ecosystem level. Topics will include toxicity test methods, environmental fate of contaminants, and the physiological and ecological effects of selected heavy metals, chlorinated organics, and pesticides. Also offered for graduate-level credit as ESM 520 and may be taken only once for credit.

ESM 424 - Wetland Ecology (4)

Structure and function of wetland ecosystems, with an emphasis on the diversity of regional wetland systems. Topics also include wetland soils, plants, and hydrologic setting and requirements for wetland delineation. Also offered for graduate-level credit as ESM 524 and may be taken only once for credit.

ESM 425 - Watershed Hydrology (4)

Study of the movement and storage of water in watersheds, emphasizing physical processes. Includes systems analysis of watersheds, precipitation, snowmelt, infiltration, evapotranspiration, groundwater flow, streamflow generation, open channel flow, hydrograph analysis and an introduction to watershed hydrologic modeling. Also offered for graduate-level credit as ESM 525 and may be taken only once for credit. Recommended prerequisites: Mth 252, Ph 201.

ESM 426 - Ecology of Streams and Rivers (4)

Evaluation of streams and rivers from an ecosystem perspective, including stream development, biological communities, ecological processes, and methods of assessment as applied to evaluation of common environmental problems. Also offered for graduate-level credit as ESM 526 and may be taken only once for credit.

ESM 427 - Watershed Biogeochemistry (4)

Study of the chemistry of watershed-based ecosystems, emphasizing physical and biological processes. Mechanisms of atmospheric input; rock weathering and soil development; physical and biological controls on the storage and flux of minerals, carbon, and nutrients in terrestrial ecosystems; and impacts of management on biogeochemical processes in watershed-based ecosystems. Also offered for graduate-level credit as ESM 527 and may be taken only once for credit. Recommended prerequisites: BI 253, Ch 221.

ESM 428 - Urban Ecology (4)

Study of ecological processes in urban environments. Emphasis on responses of flora and fauna to changes in climate, hydrology, geomorphology, geochemistry, soils and available habitat in urban areas. Includes issues of species conservation, ecosystem management and sustainability in urban systems. Also offered for graduate-level credit as ESM 528 and may be taken only once for credit. Recommended prerequisite: an undergraduate biology course or permission of instructor.

ESM 429 - Environmental Impact Assessment (4)

Environmental assessments and impact assessment techniques; regulatory and
technical requirements of impact assessment. The National Environmental Policy Act, its implementation, implications and uses. Also offered for graduate-level credit as ESM 529 and may be taken only once for credit.

ESM 433 - Natural Resource Economics (4)

An examination of the economic concepts and theories for analyzing natural resource use and related environmental pollution, including the economics of sustainability. Discussion of renewable and nonrenewable natural resource issues in the Pacific Northwest and policy alternatives. Also offered for graduate-level credit as ESM 533; this is the same course as Ec 433 and may be taken only once for credit. Recommended prerequisite: Ec 201.

Crosslisted as: Ec 433.

ESM 434 - Business Environmental Management Economics (4)

Examines the economic costs and benefits that affect the decisions of business firms to develop integrated environmental management systems. Analysis of policy options to foster business environmental management for public goods. Case studies of selected firms. Also offered for graduate-level credit as ESM 534; this is the same course as Ec 434; course may be taken only once for credit. Recommended prerequisite: Ec 201.

Crosslisted as: Ec 434.

ESM 435 - Natural Resource Policy and Management (4)

The impact of natural resource policy and management on regional and federal levels. Case studies will focus on the complex settings, difficult socioeconomic contexts and charged political environments. Also offered for graduate-level credit as ESM 535 and may be taken only once for credit.

Prerequisite: ESM 335.

ESM 443 - Global Environmental Economics (4)

An examination of the economic forces and theories to understand the causes of global environmental problems, and to evaluate policy options to remedy serious problems. Analyses of the economic effects of global environmental agreements and the environmental effects of trade and global commerce in developed and developing countries. Also offered for graduate-level credit as ESM 543; this course is the same as Ec 443; course may be taken only once for credit.

Crosslisted as: Ec 443.

ESM 444 - Forest Ecology (4)

Study of forested ecosystems, their biotic and abiotic drivers, and the theories and tools that we use to understand forest ecosystems and project how they will change. Forest ecology considers forest succession, carbon and nitrogen dynamics of forests, forest soils, climate and weather, water and energy balances, and disturbances. Also offered for graduate-level credit as ESM 544 and may be taken only once for credit.

Prerequisite: ESM 320 and ESM 321.

ESM 445 - Old-growth Forest Ecology (4)

Exploration of the ecological characteristics of west-side old-growth forests, including their outstanding biodiversity. Landscape level aspects of forest ecosystems, including the role of fire; plus the use of basic forestry measurements to contrast old-growth, second-growth, and plantation stands of trees. Emphasizing field study, this eight-day course is based at an off-campus location for easy access to forest ecosystems. Field site costs in addition to tuition. Also offered for graduate-level credit as ESM 545 and may be taken only once for credit. Recommended prerequisite: upper-division standing or graduate standing required and an undergraduate sequence in biology.

ESM 450 - Case Studies in Environmental Problem Solving (0-6)

Evaluation of selected cases of environmental problems, including field studies and project work with government and private agencies. Expected preparation: ESM 320, ESM 321, ESM 322.

ESM 451 - Project Management for Scientists (4)

Managing a science or environmental project is unique, requiring knowledge of the science discipline, project management, public participation and regulatory requirements. Topics include: defining project and tasks; understanding client or internal needs; establishing project organization, staffing, costs; public participation; satisfying regulatory requirements; adaptive management. Group work using case studies included. Also offered for graduate-level credit as ESM 551 and may be taken only once for credit.

Prerequisite: upper-division standing.

ESM 460 - Air Quality (4)

An overview of urban air quality issues facing cities in the US and globally. Examine effects of air pollution on public health and environment, as well as technologies and regulatory practices. Review pollution measurement and modeling techniques. This is the same course as CE 488 and may be taken only once for credit. Also offered for graduate-level credit as ESM 560 and may be taken only once for credit. Recommended prerequisite: ESM 320.

Crosslisted as: CE 488.

ESM 462 - Climate Change Impacts, Adaptations and Responses: Geosphere and Anthrosphere (4)

Examination of the basis for human-influenced global climate change, the interactions and feedbacks, the impact on urban and natural systems, and the management adaptation and solutions to these impacts. Also offered for graduate-level credit as ESM 562 and may be taken only once for credit.

Prerequisite: Senior or graduate standing in ESM.
ESM 463 - Water Quality Policy & Management (4)
Review and assessment of policies. Focus on the Water Quality Standards for the State of Oregon for temperature, bacteria, chemical toxins and nutrients. Role of science in decisions protecting and restoring rivers from water pollution. Also offered for graduate-level credit as ESM 563 and may be taken only once for credit. Prerequisite: ESM 335.

ESM 464 - Climate Adaptation: Managing Environmental Risks and Vulnerabilities (4)
Contribution to climate risk management will require an understanding of the fundamentals of adaptation planning, climate impacts, risk and vulnerability, and implementation. An adaptation-centered view focuses on the power of local actors to develop strategies that protect and facilitate human and environmental values under threat from global change. Also offered for graduate-level credit as ESM 564 and may be taken only once for credit. Prerequisite: ESM 335 or equivalent.

ESM 465 - Investigating Ecological and Social Issues in Urban Parks and Natural Areas (4)
Examines ecological and social aspects of urban forests. Emphasizes response of urban forests. Emphasizes response of students urban forests. Emphasizes response of students urban forests. Emphasizes response of students urban forests. Also offered for graduate-level credit as ESM 565 and may be taken only once for credit. Prerequisite: Environmental studies or environmental science major or Bi 357.

ESM 471 - Atmospheric Physics (4)
Cycles of trace gases in the Earth’s atmosphere and their role in the environment. Emission, dispersal, and removal of natural and man-made trace constituents in the atmosphere that determine the Earth’s climate and stratospheric ozone layer. Also offered for graduate-level credit as ESM 571; this is the same course as Ph 471 and may only be taken only once for credit. Prerequisite: one year each of calculus and calculus-based physics. Recommended: introductory course in differential equations. Crosslisted as: Ph 471.

ESM 473 - Phytoplankton Ecology (4)
Examination of photosynthesis, nutrient uptake, regulation and cell growth processes in the context of algal growth in natural waters. Also offered for graduate-level credit as ESM 573 and may be taken only once for credit. Recommended prerequisites: Bi 211; ESM 321 or Bi 357.

ESM 475 - Limnology and Aquatic Ecology (4)
Encompasses biological, physical, geological, and chemical aspects of freshwater environments. Overview of lake ecosystems, emphasizing fundamental interactions, processes, and ecology, as well as an appreciation of the impact of human activities on these water bodies. Also offered for graduate-level credit as ESM 575 and may be taken only once for credit. Prerequisite: ESM 321 or Bi 357. Expected preparation: Ch 223.

ESM 477 - Limnology Laboratory (2)
Techniques in field and laboratory analysis of freshwater systems. Also offered for graduate-level credit as ESM 577 and may be taken only once for credit. Recommended pre- or corequisite: ESM 475/575.

ESM 478 - Aquatic Vascular Plants (4)
Classification, biology, ecology, and management of aquatic vascular plants. Course will focus on freshwater systems and include a laboratory featuring field identification and laboratory experimentation. Also offered for graduate-level credit as ESM 578 and may be taken only once for credit. Recommended prerequisite: Bi 357.

ESM 479 - Fate and Transport of Toxics in the Environment (4)
Chemical, physical, and biological principles that govern the behavior of toxic materials such as heavy metals and synthetic organic compounds in the environment. Course emphasizes practical ways to represent chemical processes in models of pollutant behavior. Topics include: adsorption of pollutants on soils and sediments; transport across sediment-water and air-water interfaces; bioamplification of pollutants; multiphase fugacity models of organics; case studies of contaminated surface water, sediment and groundwater. Also offered for graduate-level credit as ESM 579; this course is the same as CE 479; course may be taken only once for credit. Recommended prerequisite: senior or graduate standing. Crosslisted as: CE 479.

ESM 480 - Coastal Marine Ecology (4)
Introduces the relationships between marine species and their environment, intra- and inter-specific interactions, and factors structuring marine communities. Community structure and distribution presented in the context of both oceanography and coastal zone ecology. Marine conservation issues, including fisheries, addressed. A field trip required. Also offered for graduate-level credit as ESM 580 and may be taken only once for credit. Recommended prerequisite: ESM 321.

ESM 483 - Marine Conservation and Management (4)
This course will be divided into three sections. We will begin by discussing the state of the oceans, and ecological differences between marine and terrestrial/ aquatic systems. The second part of the course will discuss the major threats to ocean systems. The third part of the course will focus on solutions in terms of protected areas, management and policy strategies, and various aspects of the human dimension. Also offered for graduate-level credit as ESM 583 and may be taken only once for credit. Recommended prerequisite: ESM 335.

ESM 485 - Ecology and Management of Bio- Invasions (4)
Invasive, or nonindigenous, species present us with global ecological and economic problems and have been ranked as second only to habitat destruction as a threat to our natural areas and native species. These invasive species are a concern because they restructure ecosystems, affect the evolutionary trajectory of native species, lead to the extinction of species, and impact local industries. Also offered for graduate-level credit as ESM 585 and may be taken only once for credit. Recommended prerequisite: ESM 321.
ESM 499 - Special Studies (1-8)
See department for course description. Consent of instructor and program director. (Credit to be arranged.)

ESM 501 - Research (1-9)
See department for course description. Consent of instructor and program director. (Credit to be arranged.)

ESM 503 - Thesis (1-12)
All aspects of research and thesis writing for master’s students. (Credit to be arranged.)

ESM 504 - Cooperative Ed/Internships (1-9)
See department for course description. (Credit to be arranged.)

ESM 505 - Reading and Conference (1-9)
See department for course description. (Credit to be arranged.)

ESM 506 - Special Projects (1-9)
See department for course description. (Credit to be arranged.)

ESM 507 - Seminar (1-6)
Weekly seminar series on topical environmental issues. May be repeated for up to 3 credits for M.S. or M.E.M students.

ESM 509 - Practicum (1-9)
See department for course description. (Credit to be arranged.)

ESM 510 - Selected Topics (1-12)
See department for course description. Consent of instructor. (Credit to be arranged.)

ESM 516 - Ecosystem Restoration (4)
Ecological theories and principles that guide restoration practices in a variety of ecosystems, including rivers, wetlands, forests, and prairies. Causes of ecosystem degradation, motivations for restoration, and factors that influence success in restoration. Interactions between science, philosophy, engineering, environmental management, policy, and politics in the dynamic world of ecosystem restoration. Also offered for undergraduate-level credit as ESM 416 and may be taken only once for credit.
Prerequisite: ESM 335 or Geog 345 or Bi 357 or ESM 321.

ESM 518 - Landscape Ecology (4)
Examines the structure, function, and change of natural and human-modified communities at the scale between individual communities and regional biomes. Focuses on spatial patterns and processes as they relate to the patch mosaic of interacting ecological communities. Expected preparation: Geog 313 or Bi 357. Upper-division standing required. Also offered for undergraduate-level credit as ESM 418; this is the same course as Geog 518 and may be taken only once for credit.
Crosslisted as: Geog 518.

ESM 520 - Ecological Toxicology (4)
effects of environmental contaminants at the individual, population, and ecosystem level. Topics will include toxicity test methods, environmental fate of contaminants, and the physiological and ecological effects of selected heavy metals, chlorinated organics, and pesticides. Also offered for undergraduate-level credit as ESM 420 and may be taken only once for credit.

ESM 524 - Wetland Ecology (4)
Structure and function of wetland ecosystems, with an emphasis on the diversity of regional wetland systems. Topics also include wetland soils, plants, and hydrologic setting and requirements for wetland delineation. Also offered for undergraduate-level credit as ESM 424 and may be taken only once for credit.

ESM 525 - Watershed Hydrology (4)
Study of the movement and storage of water in watersheds, emphasizing physical processes. Includes systems analysis of watersheds, precipitation, snowmelt, infiltration, evapotranspiration, groundwater flow, streamflow generation, open channel flow, hydrograph analysis and an introduction to watershed hydrologic modeling. This is the same course as CE 565 and may be taken only once for credit. Also offered for undergraduate-level credit as ESM 425 and may be taken only once for credit. Recommended prerequisites: Mth 252, Ph 201.
Crosslisted as: CE 565.

ESM 526 - Ecology of Streams and Rivers (4)
Evaluation of streams and rivers from an ecosystem perspective, including stream development, biological communities, ecological processes, and methods of assessment as applied to evaluation of common environmental problems. Also offered for undergraduate-level credit as ESM 426 and may be taken only once for credit.

ESM 527 - Watershed Biogeochemistry (4)
Study of the chemistry of watershed-based ecosystems, emphasizing physical and biological processes. Mechanisms of atmospheric input; rock weathering and soil development; physical and biological controls on the storage and flux of minerals, carbon, and nutrients in terrestrial ecosystems; and impacts of management on biogeochemical processes in watershed-based ecosystems. Also offered for undergraduate-level credit as ESM 427 and may be taken only once for credit. Recommended prerequisites: Bi 253, Ch 221.

ESM 528 - Urban Ecology (4)
Study of ecological processes in urban environments. Emphasis on responses of flora and fauna to changes in climate, hydrology, geomorphology, geochemistry, soils and available habitat in urban areas. Includes issues of species conservation, ecosystem management and sustainability in urban systems. Also offered for undergraduate-level credit as ESM 428 and may be taken only once for credit. Recommended prerequisite: an undergraduate biology course or permission of instructor.

ESM 529 - Environmental Impact Assessment (4)
Environmental assessments and impact assessment techniques; regulatory and technical requirements of impact assessment. The National Environmental Policy Act, its implementation, implications and uses. Also offered for undergraduate-level credit as ESM 429 and may be taken only once for credit.

ESM 533 - Natural Resource Economics (4)
An examination of the economic concepts and theories for analyzing natural resource use and related environmental pollution, including the economics of sustainability.
Discusses the complexities of natural resource management in the Pacific Northwest and policy alternatives. Also offered for undergraduate-level credit as ESM 433; this is the same course as Ec 533 and may be taken only once for credit.

Crosslisted as: Ec 533.

ESM 534 - Business Environmental Management Economics (4)

Examines the economic costs and benefits that affect the decisions of business firms to develop integrated environmental management systems. Analysis of policy options to foster business environmental management for public goods. Case studies of selected firms. Also offered for undergraduate-level credit as ESM 434; this is the same course as Ec 534; course may be taken only once for credit. Recommended prerequisite: Ec 201.

Crosslisted as: Ec 534.

ESM 535 - Natural Resource Policy and Management (4)

The impact of natural resource policy and management on regional and federal levels. Case studies will focus on the complex settings, difficult socioeconomic contexts and charged political environments. Also offered for undergraduate-level credit as ESM 435 and may be taken only once for credit.

Prerequisite: ESM 335.

ESM 536 - Environmental Institutions and Management (4)

Fundamental concepts of environmental management with case studies illustrating current management issues regarding human environment interactions. Participants will learn management theory and concepts and apply this knowledge through fieldwork conducting institutional analysis and presenting a group management plan for a local site. Also offered for undergraduate-level credit as ESM 436 and may be taken only once for credit.

ESM 543 - Global Environmental Economics (4)

An examination of the economic forces and theories to understand the causes of global environmental problems, and to evaluate policy options to remedy serious problems. Analyses of the economic effects of global environmental agreements and the environmental effects of trade and global commerce in developed and developing countries. Also offered for undergraduate-level credit as ESM 443; this is the same course as Ec 443/543; course may be taken only once for credit.

Crosslisted as: Ec 543.

ESM 544 - Forest Ecology (4)

Study of forested ecosystems, their biotic and abiotic drivers, and the theories and tools that we use to understand forest ecosystems and project how they will change. Forest ecology considers forest succession, carbon and nitrogen dynamics of forests, forest soils, climate and weather, water and energy balances, and disturbances. Also offered for undergraduate-level credit as ESM 444 and may be taken only once for credit.

Prerequisite: ESM 320 and ESM 321.

ESM 545 - Old-growth Forest Ecology (4)

Exploration of the ecological characteristics of west-side old-growth forests, including their outstanding biodiversity. Landscape level aspects of forest ecosystems, including the role of fire; plus the use of basic forestry measurements to contrast old-growth, second-growth, and plantation stands of trees. Emphasizing field study, this eight-day course is based at an off-campus location for easy access to forest ecosystems. Field site costs in addition to tuition. Also offered for undergraduate-level credit as ESM 445 and may be taken only once for credit.

Recommended prerequisite: upper-division standing.

ESM 551 - Project Management for Scientists (4)

Managing a science or environmental project is unique, requiring knowledge of the science discipline, project management, public participation and regulatory requirements. Topics include: defining project and tasks; understanding client or internal needs; establishing project organization, staffing, costs; public participation; satisfying regulatory requirements; adaptive management. Group work using case studies included. Also offered for undergraduate-level credit as ESM 451 and may be taken only once for credit.

Prerequisite: upper-division standing.

ESM 552 - Environmental Regulation and Non-regulatory Approaches (3)

Understanding environmental regulations and the interaction between governmental agencies and business is critical. Course provides basics of major environmental regulations, the importance state and the federal governments are responding to regulatory issues, and interaction with businesses through innovation and performance based approaches. Case studies and group work included.

ESM 554 - Forest Ecology (4)

Study of forested ecosystems, their biotic and abiotic drivers, and the theories and tools that we use to understand forest ecosystems and project how they will change. Forest ecology considers forest succession, carbon and nitrogen dynamics of forests, forest soils, climate and weather, water and energy balances, and disturbances. Also offered for undergraduate-level credit as ESM 444 and may be taken only once for credit.

Prerequisite: ESM 320 and ESM 321.

ESM 555 - Science Communication (1)

Students will outline the objectives involved in presenting scientific information to different audiences, including the role of the speaker, visual presentation of data, written and mixed media. This course is the same as ESR 655 and may be taken only once for credit.

Crosslisted as: ESR 655.

ESM 556 - Advanced Science Communication Skills (1)

Students will explore more advanced topics on presentation and proposal preparation. All students will prepare a mock-up poster based on cognitive and graphic design principles. They will create an extended outline for a research proposal. Peers in class will critique posters and proposals. This is the same course as ESR 656 and may be taken only once for credit.

Prerequisite: G 610 Writing Skills or ESM 555. Crosslisted as: ESR 656.

ESM 557 - Science, Media and the Public: Working with the Media to Create Effective Scientific Messages (1)

Scientists need to explain their studies to the public through mass media. Topics include; audience, written media, the reporters’ process, editor’s view of science stories, and how inaccuracies get perpetuated. Students
will evaluate a wide variety of mass media materials, interview practice, and guests' description of various media. This is the same course as ESR 657 and may be taken only once for credit.

Crosslisted as: ESR 657.

ESM 560 - Air Quality (4)

An overview of urban air quality issues facing cities in the US and globally. Examine effects of air pollution on public health and environment, as well as technologies and regulatory practices. Review pollution measurement and modeling techniques. Also offered for undergraduate-level credit as ESM 460 and may be taken only once for credit. Recommended prerequisite: ESM 320.

Crosslisted as: CE 588.

ESM 562 - Climate Change Impacts, Adaptations and Responses: Geosphere and Anthrosphere (4)

Examination of the basis for human-influenced global climate change, the interactions and feedbacks, the impact on urban and natural systems, and the management adaptation and solutions to these impacts. Also offered for undergraduate-level credit as ESM 462 and may be taken only once for credit.

ESM 563 - Water Quality Policy & Management (4)

Review and assessment the efficacy of water quality laws, regulations, and policies. Focus on the Water Quality Standards for the State of Oregon for temperature, bacteria, chemical toxins and nutrients. Role of science in decisions protecting and restoring rivers from water pollution. Also offered for undergraduate-level credit as ESM 463 and may be taken only once for credit.

Prerequisite: ESM 335.

ESM 564 - Climate Adaptation: Managing Environmental Risks and Vulnerabilities (4)

Contribution to climate risk management will require an understanding of the fundamentals of adaptation planning, climate impacts, risk and vulnerability, and implementation. An adaptation-centered view focuses on the power of local actors to develop strategies that protect and facilitate human and environmental values under threat from global change. Also offered for undergraduate-level credit as ESM 464 and may be taken only once for credit.

ESM 565 - Investigating Ecological and Social Issues in Urban Parks and Natural Areas (4)

Examines ecological and social aspects of urban forests. Emphasizes response of native plants to physical and introduced species impacts from urbanization. Students will collect ecological and visitor impact data in local parks, study issues pertaining to sustainability and management based on an understanding of short term and longer-term disturbances. Also offered for undergraduate-level credit as ESM 465 and may be taken only once for credit.

Prerequisite: Environmental studies or environmental science major or Bi 357.

ESM 566 - Environmental Data Analysis (4)

Application of probabilistic and statistical models to the description of environmental data with a focus on hydrology and water quality. Graphical and quantitative techniques of exploratory data analysis, selection and fitting of appropriate probability distributions, simple and multiple and multivariate regression and their applications to analysis and modeling, and detection of changes and trends in environmental time series. The is the same course as CE 566 and may be taken only once for credit.

Prerequisite: graduate standing and Stat 243 and 244 or Stat 460. Crosslisted as: CE 566.

ESM 567 - Multivariate Analysis of Environmental Data (4)

Biological and environmental data are usually complex, consisting of many observations and variables. This course provides an overview of the main techniques of multivariate data analysis that are relevant and useful in ecology and environmental science. Emphasis is on ordination and cluster analysis.

Prerequisite: one college-level statistics course.

ESM 570 - Citizen Environmental Science (4)

Overview of the purpose and scope of citizen science. Provides an educational framework for the range of possible citizen programs, methodology for planning and training participants, and methods of assessment of outcomes. Students will be expected to participate in practical experience working with one or more programs.

ESM 571 - Atmospheric Physics (4)

Cycles of trace gases in the Earth's atmosphere and their role in the environment. Emission, dispersal, and removal of natural and man-made trace constituents in the atmosphere that determine the Earth's climate and stratospheric ozone layer. Also offered for undergraduate-level credit as ESM 471; this is the same course as Ph 571 and may only be taken only once for credit.

Prerequisite: one year each of calculus and calculus-based physics. Recommended: introductory course in differential equations. Crosslisted as: Ph 571.

ESM 573 - Phytoplankton Ecology (4)

Examination of photosynthesis, nutrient uptake, regulation and cell growth processes in the context of algal growth in natural waters. Also offered for undergraduate-level credit as ESM 473 and may be taken only once for credit.

ESM 575 - Limnology and Aquatic Ecology (4)

Encompasses biological, physical, geological, and chemical aspects of freshwater environments. Overview of lake ecosystems, emphasizing fundamental interactions, processes, and ecology, as well as an appreciation of the impact of human activities on these waterbodies. A field trip is required. Also offered for undergraduate-level credit as ESM 475 and may be taken only once for credit.

Prerequisite: ESM 321 or Bi 357. Expected preparation: Ch 223.

ESM 577 - Limnology Laboratory (2)

Techniques in field and laboratory analysis of freshwater systems. Also offered for undergraduate-level credit as ESM 477 and may be taken only once for credit. Recommended pre- or corequisite: ESM 475/575.

ESM 578 - Aquatic Vascular Plants (4)

Classification, biology, ecology, and management of aquatic vascular plants. Course will focus on freshwater systems and include a laboratory featuring field
ESM 579 - Fate and Transport of Toxics in the Environment (4)

Chemical, physical, and biological principles that govern the behavior of toxic materials such as heavy metals and synthetic organic compounds in the environment. Course emphasizes practical ways to represent chemical processes in models of pollutant behavior. Topics include: adsorption of pollutants on soils and sediments; transport across sediment-water and air-water interfaces; bioamplification of pollutants; multiphase fugacity models of organics; case studies of contaminated surface water, sediment and groundwater. Also offered for undergraduate-level credit as ESM 479; this course is the same as CE 479/579; course may be taken only once for credit. Recommended prerequisite: senior or graduate standing. Crosslisted as: CE 579.

ESM 580 - Coastal Marine Ecology (4)

Introduces the relationships between marine species and their environment, intra- and inter-specific interactions, and factors structuring marine communities. Community structure and distribution presented in the context of both oceanography and coastal zone ecology. Marine conservation issues, including fisheries, addressed. A field trip required. Also offered for undergraduate-level credit as ESM 480 and may be taken only once for credit. Recommended prerequisite: ESM 321.

ESM 583 - Marine Conservation and Management (4)

This course will be divided into three sections. We will begin by discussing the state of the oceans, and ecological differences between marine and terrestrial/aquatic systems. The second part of the course will discuss the major threats to ocean systems. The third part of the course will focus on solutions in terms of protected areas, management and policy strategies, and various aspects of the human dimension. Also offered for undergraduate-level credit as ESM 483 and may be taken only once for credit. Recommended prerequisite: ESM 335.

ESM 585 - Ecology and Management of Bio-Invasions (4)

Invasive, or nonindigenous, species present us with global ecological and economic problems and have been ranked as second only to habitat destruction as a threat to our natural areas and native species. These invasive species are a concern because they restructure ecosystems, affect the evolutionary trajectory of native species, lead to the extinction of species, and impact local industries. Also offered for undergraduate-level credit as ESM 485 and may be taken only once for credit. Recommended prerequisite: ESM 321.

ESM 588 - Environmental Sustainability (4)

Sustainability in natural and human-influenced ecosystems, with a focus on processes of regeneration, maturity, collapse and renewal. Topic areas include natural provisioning of ecosystem services, processes of change in ecological systems, interactions among ecological and social systems, economic valuation of ecosystem services, and ecosystem management.

ESM 590 - Ecosystem Services and Sustainability: Developing a Toolkit (1)

Ecosystem services provide a conceptual framework for addressing ecological, social and economic sustainability. Students will learn to use an interdisciplinary toolbox of methods and techniques useful for assessing various aspects of ecosystem services. Students will develop a project proposal on a real-world application of ecosystem services assessments and valuation. Also offered for credit as ESM 590 and may be taken only once for credit.

ESM 599 - Special Studies (1-8)

See department for course description. Consent of instructor and program director. (Credit to be arranged.)

ESM 690 - Ecosystem Services and Sustainability: Developing a Toolkit (1)

Ecosystem services provide a conceptual framework for addressing ecological, social and economic sustainability. Students will learn to use an interdisciplinary toolbox of methods and techniques useful for assessing various aspects of ecosystem services. Students will develop a project proposal on a real-world application of ecosystem services assessments and valuation. Also offered for credit as ESM 590 and may be taken only once for credit.

ESR - Environmental Sciences & Research

ESR 407 - Environmental Seminar (0-6)

Weekly seminar series involving student-led discussion of topical environmental issues. May be repeated for up to 3 credits.

ESR 507 - Seminar (1-6)

Weekly seminar series on topical environmental issues. May be repeated for up to 3 credits.

ESR 601 - Research (0-12)

Research that is not normally part of the thesis.

ESR 602 - Independent Study (1-9)

(Credit to be arranged.)

ESR 603 - Dissertation (1-12)

All aspects of thesis including thesis research and writing the dissertation.

ESR 604 - Cooperative Education/Internship (0-9)

(Credit to be arranged.)

ESR 605 - Reading and Conference (0-12)

Scholarly examination of literature including discussion between student and professor.

ESR 606 - Project (1-9)

(Credit to be arranged.)

ESR 607 - Seminar (1-9)

Environmental Sciences Seminar. Consent of instructor. Pass/no pass only.

ESR 610 - Selected Topics (1-12)

(Credit to be arranged.)

ESR 630 - Introduction to Transdisciplinary Modes of Critical Inquiry and Science in Environmental Research (3)

This course draws on representatives from research groups in the School to present the many ways to formulate questions and different forms of science that are being actively used to address environmental problems. We will explore curiosity- and problem-based approaches from social, physical and biological sciences.
ETM - Engineering Management
ETM 410 - Selected Studies (1-6)
(Credit to be arranged.)

ETM 501 - Research (1-9)
(Credit to be arranged.)

ETM 502 - Independent Study (1-9)
(Credit to be arranged.)

ETM 503 - Thesis (1-9)
(Credit to be arranged.)

ETM 504 - Cooperative Education/Internship (1-9)
(Credit to be arranged.)

ETM 505 - Reading and Conference (1-6)
(Credit to be arranged.)

ETM 506 - Special Projects (0-9)
(Credit to be arranged.)

ETM 507 - Seminar (1-9)
(Credit to be arranged.)

ETM 509 - Practicum (1-9)
(Credit to be arranged.)

ETM 510 - Selected Topics (1-6)
(Credit to be arranged.)

ETM 511 - Technology Management Writing and Presentations (4)

ETM 518 - Ethical Issues in Technology Management (4)

ETM 520 - Management of Engineering and Technology (4)

ETM 522 - Communication and Team Building (4)
ETM 525 - Strategic Planning (4)
Critical issues in shaping the competitive strategy for the engineering- and technology-driven companies in a turbulent business environment; key steps and end results of the planning process; corporate mission; Key Result Areas (KRAs) and situational analysis including strengths, weaknesses, opportunities, and threats in KRAs. Identifying planning assumptions, critical issues, setting objectives, formulating strategy. Leadership, organizational culture, and structure to support the implementation of a strategic plans as well as the strategic control systems. Case studies, presentations, term projects, teamwork, and interactive exercises. Also offered as ETM 625 and may be taken only once for credit.
Prerequisite: graduate standing or consent of instructor.

ETM 526 - Strategic Management of Technology (4)
Analyses of the structure and competitive dynamics of technology-driven industries; resource- and knowledge-based frameworks for competitive advantage, which are applied to technology-driven industries; as well as a discussion of corporate, international and global strategies for technology-driven ventures. Also offered as ETM 626 and may be taken only once for credit.

ETM 527 - Competitive Strategies in Technology Management (4)
Provides perspectives, theories and methods used to analyze, formulate and implement competitive strategies in technology intensive industries. Provides a historical perspective on the evolution of competitive strategy theory and techniques including their foundations with key concepts and issues from strategic management thought leaders and present examples of the application of those concepts in business situations. Covers frameworks and tools used for strategy analysis, development and implementation. Also offered as ETM 627 and may be taken only once for credit.
Prerequisite: graduate standing or consent of instructor.

ETM 530 - Decision Making (4)
Decision and value theory concepts are applied to technical and management decisions under uncertainty. Multi-criteria decisions are analyzed. Subjective, judgmental values are quantified for expert decisions and conflict resolution in strategic decisions involving technological alternatives. Hierarchical decision modeling approach is introduced. Individual and aggregate decisions are measured. Decision discrepancies and group disagreements are evaluated. Case studies are included in the course. Also offered as ETM 630 and may be taken only once for credit.
Prerequisite: ETM 520 or ETM 620, knowledge of probability/statistics.

ETM 531 - Technology Assessment & Acquisition (4)
Fundamental concepts of assessing technologies including evaluation attributes and methodologies, impacts and impact relationships, and technology diffusion from individual, organizational, technical and market perspectives. Case studies, professional and research articles, and guest speakers from local companies included. Also offered as ETM 631 and may be taken only once for credit.

ETM 532 - Technology Forecasting (4)
Fundamental concepts of technology forecasting. Differences between ordinary forecasting and technology forecasting, objectives of technology forecasting, tools and methods and their applications, selection of the right forecasting methodology, planning for technology forecasting, identifying attributes for forecasting, and managing technology forecasting. Topics are discussed through case studies, professional and research articles, guest speakers from local companies, and recently published books. Also offered as ETM 632 and may be taken only once for credit.

ETM 533 - Technology Transfer (4)
Fundamental concepts of transferring technologies. Topics include university, industry and government collaboration for technology development, transfer of technologies from labs into product groups, research and development consortia, and international technology transfer. Case studies, professional and research articles, and guest speakers from local companies included. Also offered as ETM 633 and may be taken only once for credit.

ETM 534 - Technology Roadmapping (4)
Introduces Technology Roadmapping (TRM), which provides a structured approach for exploring and communicating the relationships between evolving and developing markets, products and technologies over time. Roadmaps allow technology developments to be integrated with business planning, and the impact of new technologies and market developments to be assessed. Roadmaps also seek to capture the environmental landscape, threats and opportunities for a particular group of stakeholders in a technology or application area. Also offered as ETM 634 and may be taken only once for credit.

ETM 535 - Advanced Engineering Economics (4)
Economic evaluation of engineering and RD projects is covered from the engineering management viewpoint. Time value of money, tax considerations, break-even analysis, sensitivity analysis, project evaluations under uncertainty, risk sharing, capital budgeting, financial ratios, and cost estimating techniques are studied. A business simulation game is used throughout the course to gain a better understanding of financial decision making. Also offered as ETM 635 and may be taken only once for credit.
Prerequisite: graduate standing or consent of instructor, knowledge of probability/statistics.

ETM 536 - RDM: R&D Management (4)
Managerial aspects of Research and Development (RD) including special issues in managing research at national labs, university settings, and industry labs. Reviews evaluation methods and multi objective analysis used for R&D project selection. Development analyzed across the following venues: Roadmap Development, Eco system Development, Platform Development, Product Development, Technology Development, Prototype Development, Initiative Development. Focus on integration of research and development functions; project management challenges resulting from the uncertain nature of R&D; and the difficulties in measuring on-going RD outputs. Also offered as ETM 636 and may be taken only once for credit.
ETM 537 - Benchmarking Using Data Envelopment Analysis (4)

This course focuses on data envelopment analysis, a powerful and flexible technique for quantitative benchmarking and productivity analysis. Applications and case studies from a wide range of areas including engineering, health care, education, financial services, new product development, technology forecasting, and non-profit organizations will be included. Also offered as ETM 637 and may be taken only once for credit.

Prerequisite: graduate standing or consent of instructor, linear programming.

ETM 538 - Decision Support Systems: Data Warehousing (4)

Critical issues in developing data warehouse for decision support systems. Examines when and why an organization needs a data warehouse for decision support systems; how to organize data in a data warehouse; complications in designing a data warehouse system; and identifying resources. Also offered as ETM 638 and may be taken only once for credit.

ETM 540 - Operations Research (4)

Covers the use of operations research techniques in making engineering and technology management decisions. The primary emphasis is placed on applying and interpreting linear and integer programming. Problem formulations, mathematical model building, the basic principles behind the Simplex algorithm, and multiple objective linear optimization are included in the course. Post-optimality analysis is studied from the viewpoint of technology management. Other operations research techniques such as queuing models will also be covered. The course includes a term project involving an actual operations problem. Also offered as ETM 640 and may be taken only once for credit.

Prerequisite: graduate standing or consent of instructor.

ETM 543 - Front End Management for New Product Development (4)

Provides students with an understanding of the activities and challenges of managing the early stages of new product development, the so-called "fuzzy front-end". It covers concepts, methods and tools for bridging the gap between strategic planning and new product development, for identifying opportunities, for generating and selecting product ideas, for developing product concepts, and for selecting new product development projects. Also offered as ETM 643 and may be taken only once for credit.

ETM 544 - Organizational Project Management (4)

Covers the strategic components which drive the integration of initiatives, goals and projects within an organization. It involves the three primary domains of Portfolio, Program and Project Management. These domains support the management of business units, functions or company divisions and need to be in alignment for the business organization to be effective in pursuit of its vision. Includes coverage of macro level project management topics such as project management maturity models and the micro level such as agile project management. Also offered as ETM 644 and may be taken only once for credit.

ETM 545 - Project Management (4)

Critical issues in the management of engineering and high technology projects; analysis of time, cost, performance parameters from the organizational, people, and resource perspectives; project planning evaluation and selection, including project selection models; project and matrix organizations; project teams; scheduling and termination of projects. Case discussions and term project are included in the course. Also offered as ETM 645 and may be taken only once for credit.

Prerequisite: ETM 520 or ETM 620 or consent of instructor.

ETM 546 - Project Management Tools (4)

An in-depth study and review of the major problems and analytical techniques used in the planning and implementing of major industrial projects. Specific focus on three primary areas: (1) time management: network scheduling techniques, including CPM/PERT, Critical Chain, etc., (2) cost: earned value analysis, and (3) risk: management techniques such as Monte Carlo analysis. An emphasis is placed on the integration of the techniques in the areas. The contingency approach to designing a project management toolbox based on the three areas of time, cost, and risk management is included. Also offered as ETM 646 and may be taken only once for credit.

Prerequisite: ETM 545/645 or project management experience.

ETM 547 - New Product Development (4)

Examines complete product development process and key issues in new product development critical to developing profitable products in today's technology oriented companies. Topics include technology integration, disruptive technologies, concurrent engineering, and creating innovative environments. Review of cases and published articles addressing these issues. Students develop a plan for a new product including risk assessments in areas such as manufacturing, design, and testing. Also offered as ETM 647 and may be taken only once for credit.

ETM 548 - Managing New Technology Introduction (4)

Management procedures and key underlying concepts for effective planning, development, and introduction into volume production utilizing new technology are covered. Emphasis will be on semiconductor technology and manufacturing but most principles and methodologies are generally applicable to both hardware and software. Also offered as ETM 648 and may be taken only once for credit.

ETM 549 - Management of Technology Innovation (4)

Describes and explains phenomena pertaining to technological innovation. Focus on the interplay between engineering/technology and the economical, cultural, psychological, social and technical aspects of the engineering environment. Provides technology managers a toolkit to make engineering and technical innovations successful. Also covers how engineering and technology management enables technological innovation. Also offered as ETM 649 and may be taken only once for credit.

ETM 550 - Manufacturing Systems Engineering (4)

Underlying concepts of manufacturing or production systems; product and process planning; job/flow shops; group technology, and flexible manufacturing cells. Also offered
as ETM 650 and may be taken only once for credit.

Prerequisite: graduate standing.

ETM 551 - Manufacturing Systems Management (4)

Traditional and emerging techniques in manufacturing management; the evolution of concepts from EOQ to MRP and JIT including what has gone wrong with them. Other management level issues include aggregate production planning, enterprise requirements planning, and concurrent engineering. Also offered as ETM 651 and may be taken only once for credit.

Prerequisite: Background in manufacturing at the level of ETM 550/650 or equivalent, or consent of instructor.

ETM 553 - Manufacturing Systems Simulation (4)

Introduction of discrete simulation techniques for the modeling of random processes and probabilistic events in the simulation of manufacturing systems; concepts of systems modeling with emphasis on the use of an animated simulation package throughout the course. Also offered as ETM 653 and may be taken only once for credit. This is the same course as SySc 553 and may be taken only once for credit.

Prerequisite: graduate standing or consent of instructor, basic knowledge of probability and statistics. Crosslisted as: SySc 553.

ETM 555 - Technology Marketing (4)

This course is designed to introduce students to the special issues faced by managers marketing technological products in markets characterized by rapid environmental change. Topics will include an examination of the marketing/engineering/manufacturing interface, product innovation strategies, value-based pricing, buyer behavior and strategic selling, competitive market analysis and positioning, and distribution strategies. Emphasis is placed on strategies for marketing technology products in industrial markets. Also offered as ETM 655 and may be taken only once for credit.

Prerequisite: graduate standing or consent of instructor.

ETM 556 - User-Centered Innovation (4)

Introduction to the various strengths and weaknesses of approaches to innovation. Focuses on a customer-driven methodology and introduces the increasingly prominent role of design in creating memorable experience, and emotional connection with a product and/or a company. Also offered as ETM 656 and may be taken only once for credit.

ETM 558 - Engineering Financial Management (4)

Teaches key concepts of financial and cost management and their linkage to overall business strategies for nonfinancial managers. Emphasizes the educational needs and perspective of functional and project managers in engineering and research.

Prerequisite: graduate standing.

ETM 559 - Global Management of Technology (4)

Explores issues associated with the management of technology-driven industries in a global setting. Strategic planning and management of technological innovation and commercialization are explored in selected countries, using processes in the US as benchmarks. A specific objective of this course is to explore ways to manage the development of competitive products or services, using project teams focused on one or more countries. Also offered as ETM 659 and may be taken only once for credit.

ETM 560 - Total Quality Management (4)

Critical principles and procedures of quality management in a competitive global environment; contemporary definitions of quality; quality in production/services; quality economics; quality philosophies; planning, organizing, and controlling for quality; human resource and improvement strategies and QC tools. Case studies, presentations, term projects, and teamwork. Also offered as ETM 660 and may be taken only once for credit.

Prerequisite: graduate standing or consent of instructor.

ETM 561 - Technology Entrepreneurship (4)

Examines how to start and grow a high technology company or high technology venture. Covers the complete venture creation process: key issues in high tech markets, startup finance, growth strategies and exit strategies. Guest lectures by practicing entrepreneurs, executives and financiers. Student teams create a technology startup business around technology that they develop, write a business plan and present their technology business idea to a financier. Also offered as ETM 661 and may be taken only once for credit.

ETM 562 - New Venture Management (4)

Explores actual emerging technologies that are likely to impact or create technology-based industries in the next 1-5 years, and gives a framework for identifying, analyzing, acquiring, implementing and finally commercializing leading-edge technologies into new products or services. Also offered as ETM 662 and may be taken only once for credit.

ETM 563 - Intrepreneurship in Technology (4)

The development of new products and services is fundamental to sustaining a long-term competitive advantage. The efforts of the individual or team of entrepreneurs who are responsible for this activity become even more complex when the activity must be carried out inside an existing on-going business. Explores a procedural framework, along with typical issues often encountered such as resources, timing, political conflicts, bureaucracy, and other obstacles that must be overcome to succeed in developing products within an existing company. Also offered as ETM 663 and may be taken only once for credit.

ETM 565/655 and ETM 535/635.

ETM 565 - Research Methods for Engineering and Technology Management (4)

This course provides coverage of a range of techniques employed in technology management research and issues confronting new researchers. It is open to students enrolled in graduate programs or considering Ph.D. programs both in ETM and from other departments. Statistical topics include a variety of statistical techniques including proper selection, use, and interpretation of parametric, nonparametric,
ETM 567 - Knowledge Management (4)
Introduction to some of the critical issues and debates in knowledge management. Stresses the human and business aspects of knowledge management. Taught from the perspective of the user of technical tools and methods. Also offered as ETM 667 and may be taken only once for credit.

ETM 568 - Energy Technology Innovations (4)
Reviews management of technology and innovation in the energy sector. Specifically, focuses on the technology development highlighting the unique differences of the energy sector. Also offered as ETM 668 and may be taken only once for credit.

ETM 570 - Role of Government in Technology Management (4)
In their desire to grow their nation’s economies, governments often play an enormous role in fostering and regulating technology-related industries. Explores the connection between the GDP and its growth that is driven by technology and technology businesses. Also offered as ETM 670 and may be taken only once for credit.

ETM 571 - Managing Emerging Technologies (4)
Explores 10 current emerging technologies that are likely to impact or create technology business industries in the next 5-10 years. Develops a framework for identifying, analyzing, implementing and finally commercializing leading-edge technologies into new products or services. Also offered as ETM 671 and may be taken only once for credit.

ETM 573 - Management of Intellectual Capital (4)
Learn strategies that technology companies use to maximize profits through intellectual capital, with a focus on legally protected intellectual property. Understand that companies in different industries require different strategies. Learn how to research a company’s intellectual capital and prepare an appropriate intellectual capital management plan. Also offered as ETM 673 and may be taken only once for credit.

ETM 575 - Science and Technology Policy (4)
Presents concepts and techniques for analyzing and formulating national science technology policy, explains the process of transforming scientific knowledge into technical knowledge to design innovative products and services, and highlights the organizational interactions of research in science and technology to create national technical capabilities for economic development. Also offered as ETM 675 and may be taken only once for credit.

ETM 589 - Capstone Project (4)
For a course description, please contact the department.

ETM 590 - Engineering and Technology Management Synthesis (4)
This is an alternate choice for the capstone course in the Master of Science in Engineering and Technology Management. It synthesizes the concepts and methodologies of engineering and technology management into an individual or group project. The research base for the project may come from any combination of the study areas covered in Engineering and Technology Management. Also offered as ETM 690 and may be taken only once for credit.

ETM 601 - Research (1-9)
(Credit to be arranged.)

ETM 602 - Independent Study (1-4)
(Credit to be arranged.)

ETM 603 - Dissertation (1-9)
(Credit to be arranged.)

ETM 604 - Cooperative Education/Internship (1-9)
(Credit to be arranged.)

ETM 605 - Reading and Conference (1-9)
(Credit to be arranged.)

ETM 606 - Special Projects (0-9)
(Credit to be arranged.)

ETM 607 - Seminar (1-9)
(Credit to be arranged.)

ETM 610 - Selected Topics (1-9)
(Credit to be arranged.)

ETM 611 - Technology Management Writing and Presentations (4)
Students will learn to develop written deliverables and presentations that professional technology managers and leaders are called on to produce—reports, analyses, persuasive write-ups, announcements, presentations (prepared and impromptu), proposals and website content. Students will examine and critique examples of professional communications, as well as edit the works of others in the class. Emphasis on creativity, organization, voice, audience and objectives for the communications. Discussion topics also include professional writing standards—ethics, research and references, style considerations and requirements—as well as how to structure, organize and present academic writing. Also offered as ETM 511 and may be taken only once for credit.

ETM 618 - Ethical Issues in Technology Management (4)
Designed to meet the needs of engineers who are or will be moving into greater responsibility for management as they advance in the profession. Emphasizes the theory of ethical behavior as it relates to real world applications faced regularly in the business world today. Also offered as ETM 518 and may be taken only once for credit.

ETM 619 - Human Side of Technology Management (4)
Introduction to leadership and human resource management issues that technical managers are confronted with while managing their culturally diverse workforce of technicians, scientists and engineers. Also offered as ETM 519 and may be taken only once for credit.
ETM 620 - Management of Engineering and Technology (4)
Study of fundamental concepts of engineering and technology management to provide the students with an in-depth understanding of the underlying principles of this discipline. Innovation process, technological change, motivation and leadership theories applicable to engineers and scientists, technological entrepreneurship, strategic management of technology and system interfaces in existing and emerging technologies are discussed. Ongoing engineering and technology management research is critically evaluated in classroom discussions. Case studies and team projects are included. Also offered as ETM 520 and may be taken only once for credit.

ETM 622 - Communication and Team Building (4)
Developing high performance teams for engineering- and technology-driven companies; fundamental concepts that make an effective team; building a high-performance team; the keys to high performance; converting risks into assets; the power of commitment and discipline, and constructive communication; getting results through team dynamics, creative problem solving, and interactive exercises. Also offered as ETM 522 and may be taken only once for credit.

Prerequisite: graduate standing or consent of instructor.

ETM 625 - Strategic Planning (4)
Critical issues in shaping the competitive strategy for the engineering- and technology-driven companies in a turbulent business environment; key steps and end results of the planning process; corporate mission; Key Result Areas (KRAs) and situational analysis including strengths, weaknesses, opportunities, and threats in KRAs. Identifying planning assumptions, critical issues, setting objectives, formulating strategy. Leadership, organizational culture, and structure to support the implementation of a strategic plans well as the strategic control systems. Case studies, presentations, term projects, teamwork, and interactive exercises. Also offered as ETM 525 and may be taken only once for credit.

Prerequisite: graduate standing or consent of instructor.

ETM 626 - Strategic Management of Technology (4)
Analyses of the structure and competitive dynamics of technology-driven industries; resource- and knowledge-based frameworks for competitive advantage, which are applied to technology-driven industries; as well as a discussion of corporate, international and global strategies for technology-driven ventures. Also offered as ETM 526 and may be taken only once for credit.

ETM 627 - Competitive Strategies in Technology Management (4)
Provides perspectives, theories and methods used to analyze, formulate and implement competitive strategies in technology intensive industries. Provides a historical perspective on the evolution of competitive strategy theory and techniques including their foundations with key concepts and issues from strategic management thought leaders and present examples of the application of those concepts in business situations. Covers frameworks and tools used for strategy analysis, development and implementation. Also offered as ETM 527 and may be taken only once for credit.

Prerequisite: graduate standing or consent of instructor.

ETM 630 - Decision Making (4)
Decision and value theory concepts are applied to technical and management decisions under uncertainty. Multi-criteria decisions are analyzed. Subjective, judgmental values are quantified for expert decisions and conflict resolution in strategic decisions involving technological alternatives. Hierarchical decision modeling approach is introduced. Individual and aggregate decisions are measured. Decision discrepancies and group disagreements are evaluated. Case studies are included in the course. Also offered as ETM 530 and may be taken only once for credit.

Prerequisite: ETM 520 or ETM 620, knowledge of probability/statistics.

ETM 631 - Technology Assessment & Acquisition (4)
Fundamental concepts of assessing technologies including evaluation attributes and methodologies, impacts and impact relationships, and technology diffusion from individual, organizational, technical and market perspectives. Case studies, professional and research articles, and guest speakers from local companies included. Also offered as ETM 531 and may be taken only once for credit.

ETM 632 - Technology Forecasting (4)
Fundamental concepts of technology forecasting. Differences between ordinary forecasting and technology forecasting, objectives of technology forecasting, tools and methods and their applications, selection of the right forecasting methodology, planning for technology forecasting, identifying attributes for forecasting, and managing technology forecasting. Topics are discussed through case studies, professional and research articles, guest speakers from local companies, and recently published books. Also offered as ETM 532 and may be taken only once for credit.

ETM 633 - Technology Transfer (4)
Fundamental concepts of transferring technologies. Topics include university, industry and government collaboration for technology development, transfer of technologies from labs into product groups, research and development consortia, and international technology transfer. Case studies, professional and research articles, and guest speakers from local companies included. Also offered as ETM 533 and may be taken only once for credit.

ETM 634 - Technology Roadmapping (4)
Introduces Technology Roadmapping (TRM), which provides a structured approach for exploring and communicating the relationships between evolving and developing markets, products and technologies over time. Roadmaps allow technology developments to be integrated with business planning, and the impact of new technologies and market developments to be assessed. Roadmaps also seek to capture the environmental landscape, threats and opportunities for a particular group of stakeholders in a technology or application area. Also offered as ETM 534 and may be taken only once for credit.
ETM 635 - Advanced Engineering Economics (4)
Economic evaluation of engineering and RD projects is covered from the engineering management viewpoint. Time value of money, tax considerations, break-even analysis, sensitivity analysis, project evaluations under uncertainty, risk sharing, capital budgeting, financial ratios, and cost estimating techniques are studied. A business simulation game is used throughout the course to gain a better understanding of financial decision making. Also offered as ETM 535 and may be taken only once for credit.
Prerequisite: graduate standing or consent of instructor, knowledge of probability/statistics.

ETM 636 - RDM: R&D Management (4)
Managerial aspects of Research and Development (RD) including special issues in managing research at national labs, university settings, and industry labs. Reviews evaluation methods and multi objective analysis used for R&D project selection. Development analyzed across the following venues: Roadmap Development, Eco system Development, Platform Development, Product Development, Technology Development, Prototype Development, Initiative Development. Focus on integration of research and development functions; project management challenges resulting from the uncertain nature of R&D, and the difficulties in measuring on-going RD outputs. Also offered as ETM 536 and may be taken only once for credit.

ETM 637 - Benchmarking Using Data Envelopment Analysis (4)
This course focuses on data envelopment analysis, a powerful and flexible technique for quantitative benchmarking and productivity analysis. Applications and case studies from a wide range of areas including engineering, health care, education, financial services, new product development, technology forecasting, and non-profit organizations will be included. Also offered as ETM 537 and may be taken only once for credit.
Prerequisite: graduate standing or consent of instructor, linear programming.

ETM 638 - Decision Support Systems: Data Warehousing (4)
Critical issues in developing data warehouse for decision support systems. Examines when and why an organization needs a data warehouse for decision support systems; how to organize data in a data warehouse; complications in designing a data warehouse system; and identifying resources. Also offered as ETM 538 and may be taken only once for credit.

ETM 640 - Operations Research (4)
Covers the use of operations research techniques in making engineering and technology management decisions. The primary emphasis is placed on applying and interpreting linear and integer programming. Problem formulations, mathematical model building, the basic principles behind the Simplex algorithm, and multiple objective linear optimization are included in the course. Post-optimality analysis is studied from the viewpoint of technology management. Other operations research techniques such as queuing models will also be covered. The course includes a term project involving an actual operations problem. Also offered as ETM 540 and may be taken only once for credit.
Prerequisite: graduate standing or consent of instructor.

ETM 643 - Front End Management for New Product Development (4)
Provides students with an understanding of the activities and challenges of managing the early stages of new product development, the so-called “fuzzy front-end”. It covers concepts, methods and tools for bridging the gap between strategic planning and new product development, for identifying opportunities, for generating and selecting product ideas, for developing product concepts, and for selecting new product development projects. Also offered as ETM 543 and may be taken only once for credit.

ETM 644 - Organizational Project Management (4)
Covers the strategic components which drive the integration of initiatives, goals and projects within an organization. It involves the three primary domains of Portfolio, Program and Project Management. These domains support the management of business units, functions or company divisions and need to be in alignment for the business organization to be effective in pursuit of its vision. Includes coverage of macro level project management topics such as project management maturity models and the micro level such as agile project management. Also offered as ETM 544 and may be taken only once for credit.

ETM 645 - Project Management (4)
Critical issues in the management of engineering and high technology projects; analysis of time, cost, performance parameters from the organizational, people, and resource perspectives; project planning evaluation and selection, including project selection models; project and matrix organizations; project teams; scheduling and termination of projects. Case discussions and term project are included in the course. Also offered as ETM 545 and may be taken only once for credit.
Prerequisite: ETM 520 or ETM 620 or consent of instructor.

ETM 646 - Project Management Tools (4)
An in-depth study and review of the major problems and analytical techniques used in the planning and implementing of major industrial projects. Specific focus on three primary areas: (1) time management: network scheduling techniques, including CPM/PERT, Critical Chain, etc., (2) cost: earned value analysis, and (3) risk: management techniques such as Monte Carlo analysis. An emphasis is placed on the integration of the techniques in the areas. The contingency approach to designing a project management toolbox based on the three areas of time, cost, and risk management is included. Also offered as ETM 546 and may be taken only once for credit.
Prerequisite: ETM 545/645 or project management experience.

ETM 647 - New Product Development (4)
Examines complete product development process and key issues in new product development critical to developing profitable products in today’s technology oriented companies. Topics include technology integration, disruptive technologies, concurrent engineering, and creating innovative environments. Review of cases and published articles addressing these issues. Students develop a plan for a
new product including risk assessments in areas such as manufacturing, design, and testing. Also offered as ETM 547 and may be taken only once for credit.

ETM 648 - Managing New Technology Introduction (4)
Management procedures and key underlying concepts for effective planning, development, and introduction into volume production utilizing new technology are covered. Emphasis will be on semiconductor technology and manufacturing but most principles and methodologies are generally applicable to both hardware and software. Also offered as ETM 548 and may be taken only once for credit.

ETM 649 - Management of Technology Innovation (4)
Describes and explains phenomena pertaining to technological innovation. Focus on the interplay between engineering/technology and the economical, cultural, psychological, social and technical aspects of the engineering environment. Provides technology managers a toolkit to make engineering and technical innovations successful. Also covers how engineering and technology management enables technological innovation. Also offered as ETM 549 and may be taken only once for credit.

ETM 650 - Manufacturing Systems Engineering (4)
Underlying concepts of manufacturing or production systems; product and process planning; job/flow shops; group technology, and flexible manufacturing cells. Also offered as ETM 550 and may be taken only once for credit.

Prerequisite: graduate standing.

ETM 651 - Manufacturing Systems Management (4)
Traditional and emerging techniques in manufacturing management; the evolution of concepts from EOQ to MRP and JIT including what has gone wrong with them. Other management level issues include aggregate production planning, enterprise requirements planning, and concurrent engineering. Also offered as ETM 551 and may be taken only once for credit.

Prerequisite: Background in manufacturing at the level of ETM 550/650 or equivalent, or consent of instructor.

ETM 653 - Manufacturing Systems Simulation (4)
Introduction of discrete simulation techniques for the modeling of random processes and probabilistic events in the simulation of manufacturing systems; concepts of systems modeling with emphasis on the use of an animated simulation package throughout the course. Also offered as ETM 553; this is the same course as SySc 653 and may be taken only once for credit.

Prerequisite: graduate standing or consent of instructor, basic knowledge of probability and statistics. Crosslisted as: SySc 653.

ETM 655 - Technology Marketing (4)
This course is designed to introduce students to the special issues faced by managers marketing technological products in markets characterized by rapid environmental change. Topics will include an examination of the marketing/engineering/manufacturing interface, product innovation strategies, value-based pricing, buyer behavior and strategic selling, competitive market analysis and positioning, and distribution strategies. Emphasis is placed on strategies for marketing technology products in industrial markets. Also offered as ETM 555 and may be taken only once for credit.

Prerequisite: graduate standing or consent of instructor.

ETM 656 - User-Centered Innovation (4)
Introduction to the various strengths and weaknesses of approaches to innovation. Focuses on a customer-driven methodology and introduces the increasingly prominent role of design in creating memorable experience, and emotional connection with a product and/or a company. Also offered as ETM 556 and may be taken only once for credit.

Prerequisite: graduate standing or consent of instructor.

ETM 659 - Global Management of Technology (4)
Explores issues associated with the management of technology-driven industries in a global setting. Strategic planning and management of technological innovation and commercialization are explored in selected countries, using processes in the US as benchmarks. A specific objective of this course is to explore ways to manage the development of competitive products or services, using project teams focused on one or more countries. Also offered as ETM 559 and may be taken only once for credit.

ETM 660 - Total Quality Management (4)
Critical principles and procedures of quality management in a competitive global environment; contemporary definitions of quality; quality in production/services; quality economics; quality philosophies; planning, organizing, and controlling for quality; human resource and improvement strategies and QC tools. Case studies, presentations, term projects, and teamwork. Also offered as ETM 560 and may be taken only once for credit.

Prerequisite: graduate standing or consent of instructor.

ETM 661 - Technology Entrepreneurship (4)
Examines how to start and grow a high technology company or high technology venture. Covers the complete venture creation process: key issues in high tech markets, startup finance, growth strategies and exit strategies. Guest lectures by practicing entrepreneurs, executives and financiers. Student teams create a technology startup business around technology that they develop, write a business plan and present their technology business idea to a financier. Also offered as ETM 561 and may be taken only once for credit.

ETM 662 - New Venture Management (4)
Explores actual emerging technologies that are likely to impact or create technology-based industries in the next 1-5 years, and gives a framework for identifying, analyzing, acquiring, implementing and finally commercializing leading-edge technologies into new products or services. Also offered as ETM 562 and may be taken only once for credit.

ETM 663 - Intrepreneurship in Technology (4)
The development of new products and services is fundamental to sustaining a long-term competitive advantage. The efforts of the individual or team of entrepreneurs who are responsible for this activity become even more complex when the activity must be
ETM 665 - Research Methods for Engineering and Technology Management (4)

This course provides coverage of a range of techniques employed in technology management research and issues confronting new researchers. It is open to students enrolled in graduate programs or considering Ph.D. programs both in ETM and from other departments. Statistical topics include a variety of statistical techniques including proper selection, use, and interpretation of parametric, nonparametric, and multivariate techniques. Additional topics covered include literature review methods and tools, hierarchy of research questions, survey design, research ethics, and visual display of quantitative information. Also offered as ETM 565 and may be taken only once for credit.

Prerequisite: Probability and statistics or consent of instructor.

ETM 667 - Knowledge Management (4)

Introduction to some of the critical issues and debates in knowledge management. Stresses the human and business aspects of knowledge management. Taught from the perspective of the user of technical tools and methods. Also offered as ETM 567 and may be taken only once for credit.

ETM 668 - Energy Technology Innovations (4)

Reviews management of technology and innovation in the energy sector. Specifically, focuses on the technology development highlighting the unique differences of the energy sector. Also offered as ETM 568 and may be taken only once for credit.

Prerequisite: graduate standing.

ETM 670 - Role of Government in Technology Management (4)

In their desire to grow their nation’s economies, governments often play an enormous role in fostering and regulating technology-related industries. Explores the connection between the GDP and its growth that is driven by technology and technology businesses. Also offered as ETM 570 and may be taken only once for credit.

ETM 671 - Managing Emerging Technologies (4)

Explores 10 current emerging technologies that are likely to impact or create technology business industries in the next 5-10 years. Develops a framework for identifying, analyzing, implementing and finally commercializing leading-edge technologies into new products or services. Also offered as ETM 571 and may be taken only once for credit.

ETM 673 - Management of Intellectual Capital (4)

Learn strategies that technology companies use to maximize profits through intellectual capital, with a focus on legally protected intellectual property. Understand that companies in different industries require different strategies. Learn how to research a company’s intellectual capital and prepare an appropriate intellectual capital management plan. Also offered as ETM 573 and may be taken only once for credit.

ETM 675 - Science and Technology Policy (4)

Presents concepts and techniques for analyzing and formulating national science technology policy, explains the process of transforming scientific knowledge into technical knowledge to design innovative products and services, and highlights the organizational interactions of research in science and technology to create national technical capabilities for economic development. Also offered as ETM 575 and may be taken only once for credit.

Prerequisite: graduate standing.

ETM 670 - Engineering and Technology Management Synthesis (4)

This is an alternate choice for the capstone course in the Master of Science in Engineering and Technology Management. It synthesizes the concepts and methodologies of engineering and technology management into an individual or group project. The research base for the project may come from any combination of the study areas covered in Engineering and Technology Management. Also offered as ETM 590 and may be taken only once for credit.

Prerequisite: Completion of at least seven courses in the MS ETM curriculum or permission of instructor.

FILM - Film

FILM 131 - Film Analysis (4)

An introductory course in film analysis with special emphasis on cinema as a dramatic art and concepts related to the formal analysis of film. Elements to be considered will include cinematography, performance, edited image, and sound. Selected films will be shown.

FILM 135 - Classic Movies (4)

Study and analysis of representative films with special emphasis on the importance of directorial concept and the screenplay. Relationships between film and theater will be examined.

FILM 199 - Special Studies (1-12)

(Credit to be arranged.)

FILM 231 - Advanced Film Analysis (4)

Builds upon the concepts related to the formal analysis of film and presents students with complementary, advanced methodologies, including genre study, narrative, historical research, and industry studies.

Prerequisite: FILM 131.
FILM 257 - Digital Video Production I (4)
A study of aesthetic and technological principles as related to digital video production in narrative formats.

FILM 258 - Documentary Film Production I (4)
An introductory study of aesthetic, technical, and content-related principles of digital filmmaking in nonfiction, documentary formats.

Prerequisite: FILM 131.

FILM 280 - Classical Film Theory (4)
Introduces the significant trends of the first fifty years of Western film theory via primary and secondary source essays. Topics may include realism, authorship, conceptions of modernist representation, and Soviet montage.

Prerequisite: FILM 131.

FILM 299 - Special Studies (1-4)
(Credit to be arranged.)

FILM 311 - Understanding Movies (4)
An intermediate course in film appreciation with special emphasis on cinema as a dramatic art. Elements to be considered will include cinematography, performance, edited image, and sound. Selected films will be shown.

FILM 331U - Understanding Movies (4)
An intermediate course in film appreciation with special emphasis on cinema as a dramatic art. Elements to be considered will include cinematography, performance, edited image, and sound. Selected films will be shown. Recommended prerequisite: upper-division standing.

FILM 358 - Narrative Film Production II (4)
An intermediate study of aesthetic, technical, and content-related principles of digital filmmaking in fictional narrative formats.

Prerequisite: FILM 131; FILM 257.

FILM 359 - Narrative Film Production III (4)
An advanced study of aesthetic, technical, and content-related principles of digital filmmaking in fictional narrative formats.

Prerequisite: FILM 131; FILM 257 and FILM 358.

FILM 360 - Topics in Film Production (4)
Focused study of a variety of specialized skills and/or genres related to digital film production. From term to term, topics might include: Cinematography; Visual Effects; Sound Design; Music Videos; Web Cinema; Advanced Directing. Course may be repeated for credit with different topics.

Prerequisite: FILM 131; FILM 257 or FILM 258.

FILM 361 - Documentary Film Production II (4)
An intermediate study of aesthetic, technical, and content-related principles of digital filmmaking in nonfiction, documentary formats.

Prerequisite: FILM 131; FILM 258.

FILM 362 - Documentary Film Production III (4)
An advanced study of aesthetic, technical, and content-related principles of digital filmmaking in nonfiction, documentary formats.

Prerequisite: FILM 131, FILM 258, FILM 361.

FILM 365 - Classic Movies (4)
An intermediate study and analysis of representative films with special emphasis on the importance of directorial concept and the screenplay. Relationships between film and theater will be examined.

Recommended prerequisites: upper-division standing.

FILM 370 - Topics: Theater, Media, and Culture (4)
Study of a variety of dramaturgical, cultural, and historical issues as they appear in film, television, and other theatrical media. From quarter to quarter topics might include: Shakespeare on Film, '50s Media and Culture, American Cinema, American Culture, Vietnam on Film, Film History, Film Genres, and Hitchcock.

FILM 370U - Topics: Theater, Media, and Culture (4)
Course in screenwriting involving short and long form screenplays, the analysis of narrative structure for the screen, and the practical application screenwriting techniques. Course may be repeated for credit with different topics.

FILM 371L - Lab for Film 381 (0)
Lab for Film 381.

Corequisite: FILM 381.

FILM 372 - Film History II: Cinema and Modernism (1946-1970s) (4)
A study of the major artistic, economic and technological trends of motion picture production during the post-war era; how directors such as Hitchcock and Welles were able find a unique expression within the parameters of the classical style and the commercial pressures of the studios. Explores how world cinema movements presented aesthetic and political challenges to the Hollywood model. Co-requisite: Film 382L Film History II Lab (zero credits).

Prerequisite: Film 131 and sophomore standing recommended. Corequisite: FILM 381L.

FILM 381L - Lab for Film 381 (0)
Lab for Film 381.

Corequisite: FILM 381.

FILM 382 - Film History II: Cinema and Modernism (1946-1970s) (4)
A study of the major artistic, economic and technological trends of motion picture production during the post-war era; how directors such as Hitchcock and Welles were able find a unique expression within the parameters of the classical style and the commercial pressures of the studios. Explores how world cinema movements presented aesthetic and political challenges to the Hollywood model. Co-requisite: Film 382L Film History II Lab (zero credits).

Prerequisite: Film 131 and sophomore standing, or consent of instructor. Corequisite: FILM 382L.

FILM 382L - Lab for Film 382 (0)
Lab for Film 382.

Corequisite: FILM 382.
Rather than being strictly chronological, the context of American popular culture.

Examination of the American film industry as an art form, as an industry, and as a system of representation and communication within the context of American popular culture. Rather than being strictly chronological, the course focuses on ideas, problems, issues, and thematic concerns. Primary period of focus will extend from the end of WWII to the present. Recommended prerequisites: Film 131 and sophomore standing.

FILM 389 - Special Studies (1-6)
(Credit to be arranged.)

FILM 401 - Research (1-6)
(Credit to be arranged.)

FILM 402 - Independent Study (1-12)
(Credit to be arranged.)

FILM 404 - Cooperative Education/Internship (1-12)
(Credit to be arranged.)

FILM 405 - Reading and Conference (1-6)
(Credit to be arranged.)

FILM 406 - Project (1-6)
(Credit to be arranged.)

FILM 407 - Seminar (1-6)
(Credit to be arranged.)

FILM 408 - Workshop (1-6)
(Credit to be arranged.)

FILM 409 - Practicum (1-12)
(Credit to be arranged.)

FILM 410 - Selected Studies (1-6)
(Credit to be arranged.)

FILM 480 - Contemporary Film Theory (4)
A survey of film theory and criticism from the 1960s to the present day. Students are introduced to key concepts and major figures from Structuralism, Semiotics, Psychoanalysis, Feminism, and Narrative Theory. Also offered for graduate-level credit as FILM 580 and may be taken only once for credit.

Prerequisite: TA 131 and junior standing or consent of instructor.

FILM 484 - Anatomy of a Movie I: Product of the Studio Era (4)
First in a sequence intended for advanced film students. Operates as a case study of one well known, critically acclaimed film of the studio era, examining the industrial, technical, cultural, and artistic elements in the film's production, exhibition and reception. Topics include studio ideology and production strategies, the star system, and historic context and meaning of films. Also offered for graduate-level credit as FILM 584 and may be taken only once for credit.

Prerequisite: FILM 131 and upper division standing. Recommended: FILM 370 Film History I, II, III.

FILM 485 - Anatomy of a Movie II: The Independent Film (4)
Second in a sequence intended for advanced film students. Operates as a case study of one well known, critically acclaimed film produced independently since 1968, examining the industrial, technical, cultural and artistic elements in the film's production, exhibition and reception. Topics will include the independent filmmaker as auteur, the economics of the New Hollywood, and ideology and politics of independent filmmaking, in the U.S. and abroad. Also offered as graduate-level credit as FILM 585 and may be taken only once for credit.

Prerequisite: FILM 131 and upper division standing. Recommended: FILM 370 Film History I, II, III.

FILM 486 - Topics in Film and the Moving Image (4)
Concentrated study of genre, structure and style of a particular period, topic and/or figure in film and the moving image; for example, '70's Film TV Renaissance, Irish Cinema, and/or Robert Altman. Also offered for graduate-level credit as FILM 586 and may be taken only once for credit.

Prerequisite: FILM 131 and upper division standing.

FILM 487 - Topics in International Film and the Moving Image (4)
Concentrated study of national cinema (non-US) or national cinema movement. Students will consider the cinema in relation to: national context and cinematic history; other
FILM 504 - Cooperative Education/Internship (1-9)  
(Credit to be arranged.)

FILM 501 - Research (1-9)  
Prerequisite: FILM 131.

FILM 502 - Independent Study (1-12)  
(Credit to be arranged.)

FILM 504 - Cooperative Education/Internship (1-9)  
(Credit to be arranged.)

FILM 508 - Workshop (1-6)  
(Credit to be arranged.)

FILM 584 - Anatomy of a Movie I: Product of the Studio Era (4)  
First in a sequence intended for advanced film students. Operates as a case study of one well known, critically acclaimed film of the studio era, examining the industrial, technical, cultural, and artistic elements in the film's production, exhibition and reception. Topics will include the independent filmmaker as auteur, the economics of the New Hollywood, and ideology and politics of independent filmmaking, in the U.S. and abroad. Also offered as undergraduate-level credit as FILM 485 and may be taken only once for credit.

Prerequisite: FILM 131 and upper division standing. Recommended: FILM 370 Film History I, II, III.

FILM 586 - Topics in Film and the Moving Image (4)  
Concentrated study of genre, structure and style of a particular period, topic and/or figure in film and the moving image; for example, '70s Film TV Renaissance, Irish Cinema, and/or Robert Altman. Also offered as undergraduate-level credit as FILM 486 and may be taken only once for credit.

Prerequisite: FILM 131 and upper division standing.

FILM 587 - Topics in International Film and the Moving Image (4)  
Concentrated study of national cinema (non-US) or national cinema movement. Students will consider the cinema in relation to: national context and cinematic history; other national/transnational cinemas; and independence and nationalism, censorship, and political and artistic movements.

Examples include Irish Cinema, Italian Neorealism, and New Wave Cinemas. Also offered for undergraduate-level credit as FILM 487.

Prerequisite: BA 303.

Fin 310 - Entrepreneurial Finance and Accounting (4)  
Introduction to the fundamental concepts of entrepreneurial finance and accounting. Covers the financial aspects of developing, financing, planning, managing, valuing and assessing new business ventures. Equips students with the quantitative, financial and accounting skills required to successfully develop, finance and manage a new venture.

Fin 310U - Entrepreneurial Finance and Accounting (4)  
Introduction to the fundamental concepts of entrepreneurial finance and accounting. Covers the financial aspects of developing, financing, planning, managing, valuing and assessing new business ventures. Equips students with the quantitative, financial and accounting skills required to successfully develop, finance and manage a new venture.

Fin 319 - Intermediate Financial Management (4)  
Second level course in financial management to provide more depth in the study of asset pricing, capital budgeting, capital structure, dividend policy, working capital management, growth through mergers, and leasing. Emphasis on the development of problem solving capabilities.

Prerequisite: BA 303.

Fin 352 - Investments (4)  
Analytical study of the principles of investment in stocks, bonds, and other security instruments. Includes background study of financial markets and institutions; analysis of the investment characteristics, valuation, and market price behavior of bonds and stocks, and the choice of appropriate portfolios of these securities. Also included is the study of information and market efficiency, term structure and the determination of market interest rates, and security valuation.

Prerequisite: BA 303.

Fin 399 - Special Studies (1-12)  
(Credit to be arranged.)

(Credit to be arranged.)

Prerequisite: BA 303.
**Fin 404 - Internship (1-6)**
(Credits to be arranged.)

**Fin 405 - Reading and Conference (1-8)**
(Credit to be arranged.)
Prerequisite: BA 303.

**Fin 407 - Seminar (1-4)**
Student-selected problems in business operation and business management to be studied by the individual and discussed in group meeting under direction of academic staff. (Credit to be arranged.)

**Fin 409 - Practicum (1-12)**
(Credit to be arranged.) Field work involving the practice of professional activities away from campus.
Prerequisite: consent of instructor.

**Fin 410 - Selected Topics (1-4)**
(Credit to be arranged.) Consent of instructor.

**Fin 441 - Fundamentals of Derivative Securities (4)**
Options, futures, swaps, and other derivative securities. Principles of pricing; uses in speculation, hedging, and risk management, in both securities investment and corporate finance settings. Real options and option-like opportunities in business.
Prerequisite: Actg 381, Fin 319.

**Fin 449 - Valuation (4)**
Principles of valuation, including valuations both internal and external to the business entity. Financial planning, financial analysis, forecasting, and valuation. Students undertake and present a formal written valuation.
Prerequisite: Actg 381, Fin 319.

**Fin 456 - International Financial Management (4)**
Development and study of a framework for the financial decisions of multinational businesses; management of working capital, investment and financing decisions of a firm in an international environment; foreign exchange markets, exchange risk, and international diversification. Also offered as graduate-level credit as Fin 556 and may be taken only once for credit.
Prerequisite: BA 303, Actg 381 for Fin 456; 551 or 561 for Fin 556.

**Fin 465 - Finance Topics and Cases (4)**
Case studies of financial problems in business including working capital management, capital budgeting, and financing issues. Special topics covered will be at the discretion of the instructor.
Prerequisite: Actg 381, Fin 319 and 449.

**Fin 473 - Investment Analysis and Portfolio Management (4)**
A study of the application of both portfolio theory and fundamental valuation techniques in security investment decisions. Students in this course serve as portfolio managers to a real dollar portfolio, providing security and sector oversight to the portfolio. The implications of modern portfolio theory for portfolio management and in portfolio performance evaluation are emphasized. This is the first class in a strongly recommended two-course sequence. Offered fall, winter, and spring terms. Also offered for graduate-level credit as Fin 474 and may be taken only once for credit.
Prerequisite: Fin 319, Fin 449, and instructor approval for Fin 473; Fin 551 or Fin 561 for Fin 573; recommended Fin 553 at least concurrently for Fin 573.

**Fin 474 - Portfolio Management: Issues and Performance Assessment (2)**
This course is a continuation of Fin 573. Students will continue the responsibility of managing a real-dollar portfolio that was initiated in Fin 573. In addition, assessing and reporting on portfolio performance, and presenting a quarterly report to the investment community, will be an integral aspect of this course. This is the second course in a two-class course sequence. Offered winter, spring, and summer terms. Also offered for graduate-level credit as Fin 574 and may be taken only once for credit.
Prerequisite: Fin 473 for 474, Fin 573 for 574.

**Fin 501 - Research (1-8)**
(Credit to be arranged.)

**Fin 504 - Internship (1-8)**
(Credits to be arranged.)
at macro economic theories pertaining to market interest rates and how the Feds open market committee works. Fin 512: deals with a continued focus on creating a sustainable business structure as well as an in-depth look at applied microeconomics of the firm. Specifically looking at the underlying economic theories of supply and demand, elasticity and individual and market demand functions. The class also covers the nature of industry and explore competitive, monopolistically competitive, oligopolistic and monopolistic market structures. Pricing strategies and the economics of information are also covered. This is the first class in a sequence of two: Fin 511 and Fin 512 which must be taken in sequence. Fin 511 is a prerequisite.

**Fin 512 - Economics and Sustainability of the Firm II (4)**

Introduction to the basic ideas in contemporary economics. Concepts covered include how firms and individuals make economic decisions, how markets function to allocate resources, how market structure and corporate governance affects decision making, and how strategic interactions between firms influence pricing decisions. The course will introduce students to key concepts of macro-economics, including monetary and fiscal policies and the relationships between inflation, interest and unemployment rates. Building from the fundamentals of economic theory, the course also examines how economics is linked to ecosystems and the roles of the business and government sectors in fostering economic value creation and ecosystem stewardship. Fin 511: deals with defining what financial assets are and how they are priced in the marketplace. Understanding the role of government with respect to Fiscal policy and the role of regulation and subsidies in moving market behavior as well as the role of the Federal Reserve and what it tries to accomplish through monetary policy with regard to inflation, exchange rates and full employment goals. The course will also look at macro economic theories pertaining to market interest rates and how the Feds open market committee works. Fin 512: deals with a continued focus on creating a sustainable business structure as well as an in-depth look at applied microeconomics of the firm. Specifically looking at the underlying economic theories of supply and demand, elasticity and individual and market demand functions. The class also covers the nature of industry and explore competitive, monopolistically competitive, oligopolistic and monopolistic market structures. Pricing strategies and the economics of information are also covered. This is the second class in a sequence of two: Fin 511 and Fin 512 which must be taken in sequence. Fin 511 is a prerequisite.

**Fin 513 - Financial Management (4)**

Examines the financial concepts and problem solving skills required to evaluate whether managerial decisions add value to the firm. Students will develop an understanding of the financial implications of business decisions and a framework with which to evaluate their decisions. An integral part of this approach requires understanding how the different functional areas of a business interrelate and the supporting role that finance can provide. Topics considered include cash flow analysis, risk determination, valuation, working capital management, and financing. Ethical standards are an essential guide to sound financial decision-making and long term value creation and are integrated throughout the course.

Prerequisite: Fin 511, Fin 512 and Actg 511.

**Fin 521 - New Venture Finance (4)**

Learn how early stage companies access capital for their new ventures, how investors evaluate potential investments, and considerations for structuring the financing.

**Fin 531 - Financial Institutions (2)**

Introduces the role financial institutions play in financial markets, the structure of institutions and how they facilitate economic growth through the transfer of capital. The course then analyzes how institutions measure and manage the unique risks that they are exposed to through their ordinary operations.

Prerequisite: Fin 511 or concurrent enrollment.

**Fin 540S - Real Estate Valuation II (4)**


Prerequisite: Fin 333, Fin 319.

**Fin 545 - Hedging and Risk Management (4)**

Futures, options, swaps, and other derivative instruments, their characteristics, their uses in financial risk management, and their effects in speculative situations; methodologies for valuation of derivatives. Exotic options, innovations in exotic derivatives and in the development and use of derivatives in corporate finance and investments. The rapid development of derivatives in domestic and international finance.

Prerequisite: Fin 513 or Fin 551.

**Fin 551 - Financial Management for Financial Analysts (4)**

Gateway course to the Master of Science in financial analysis. Examines the financial concepts and problem-solving skills required to evaluate whether managerial decisions add value to the firm. Students will develop an understanding of the financial implications of business decisions and a framework with which to evaluate their decisions. An integral part of this approach requires understanding how the different functional areas of a business interrelate and the supporting role that finance provides. Topics considered include cash flow analysis, risk determination, valuation, working capital management, and financing. Ethical standards are an essential guide to sound financial decision-making and long term value creation and are integrated throughout the course.

Prerequisite: Fin 513 or Fin 551.

**Fin 552 - Investments (4)**

Analytical study of the principles of investment in stocks, bonds, and other security instruments. Includes background study of financial markets and institutions; analysis of the investment characteristics, valuation, and market price behavior of bonds, stocks, and derivative securities, and the choice of appropriate portfolios of these securities. Also included is the study of information and market efficiency, term structure and the determination of market interest rates, and security valuation.

Prerequisite: Fin 551 or Fin 513.
**Fin 552S - Investments (4)**

Analytical study of the principles of investment in stocks, bonds, and other security instruments. Includes background study of financial markets and institutions; analysis of the investment characteristics, valuation, and market price behavior of bonds, stocks, and derivative securities, and the choice of appropriate portfolios of these securities. Also included is the study of information and market efficiency, term structure and the determination of market interest rates, and security valuation.

Prerequisite: Fin 452: BA 303, Actg 381 is strongly recommended; Fin 552: Fin 551 or Fin 513.

**Fin 553 - Valuation and Analysis (4)**

Valuation and Analysis extends the financial accounting and corporate finance topics introduced in the core graduate accounting and finance courses, and uses those topics to further the understanding how to value a business or investment. This is a practical and applied course that connects accounting and business analysis with finance issues into a systematic and process-driven approach for valuation of both public and private firms. The course uses a blend of lectures, discussions, cases and projects to learn the valuation process. Topics covered include financial statement analysis, business strategy and forecasting, due diligence, discounted cash flow analysis and public versus private firm issues.

Prerequisite: Fin 551 or Fin 513.

**Fin 554 - Alternative Investments (2)**

Introduction of alternative investments to traditional equity and fixed income securities. Students will learn about common types of alternative investments, valuation methods, unique risks and relation to traditional investments. Types of assets covered may include: real estate, private equity, venture capital, hedge funds, distressed securities and commodities.

Prerequisite: Fin 552 or approval of the instructor.

**Fin 555 - Applied Econometrics for Financial Analysis (4)**

Theory and application of empirical methods, including model development, experimental design, and statistical analysis, applied to issues in business, particularly the areas of accounting and finance. Construction and testing of hypotheses, analysis of variance, multiple regression, methods for dealing with problems in the distribution of data, time series, forecasting, and performance evaluation. Publicly available data will be obtained and used by students.

Prerequisite: Fin 551 or concurrent enrollment or Fin 513.

**Fin 556 - International Financial Management (4)**

Development and study of a framework for the financial decisions of multinational businesses; management of working capital, investment and financing decisions of a firm in an international environment; foreign exchange markets, exchange risk, and international diversification. Also offered as undergraduate-level credit as Fin 456 and may be taken only once for credit.

Prerequisite: BA 303, Actg 381 for Fin 456; Fin 551 or Fin 513 for Fin 556.

**Fin 556S - International Financial Management (4)**

Development and study of a framework for the financial decisions of multinational businesses; management of working capital, investment and financing decisions of a firm in an international environment; foreign exchange markets, exchange risk, and international diversification. Also offered as undergraduate-level credit as Fin 456 and may be taken only once for credit.

Prerequisite: BA 303, Actg 381 for Fin 456; Fin 551 or Fin 513 for Fin 556.

**Fin 559S - Advanced Real Estate Valuation (3)**

Contact the department for a description of this class.

**Fin 562 - Intermediate Financial Management (4)**

Second-level course in financial management to provide more depth in the study of asset pricing, capital budgeting, capital structure, dividend policy, working capital management, growth through mergers, and leasing. Emphasis is placed on the further development of problem solving capabilities.

Prerequisite: Fin 551 or Fin 513.

**Fin 565 - Corporate Financial Strategies (4)**

This course extends the corporate finance topics introduced in the core graduate finance course and aims to deepen understanding of the strategic issues and techniques associated with financial decision making. The perspective is that of the CFO of a corporation but also considers other stakeholders. Topics may include risk management, capital budgeting, financing decisions for established and entrepreneurial firms, special topics in firm valuation, working capital, and determination of the cost of capital. This course serves as background for other finance elective courses and builds skills in key financial principles. We emphasize economic underpinnings and application issues through extensive applied case analysis using spreadsheet and risk-based tools.

Prerequisite: Fin 551 or Fin 513.

**Fin 573 - Investment Analysis and Portfolio Management (4)**

A study of the application of both portfolio theory and fundamental valuation techniques in security investment decisions. Students in this course serve as portfolio managers to a real dollar portfolio, providing security and sector oversight to the portfolio. The implications of modern portfolio theory for portfolio management and in portfolio performance evaluation are emphasized. This is the first class in a strongly recommended two-course sequence. Offered fall, winter, and spring terms. Also offered for undergraduate-level credit as Fin 574 and may be taken only once for credit.

Prerequisite: Fin 319, Fin 449, and instructor approval for Fin 473; Fin 551 or Fin 513 for Fin 573; recommended Fin 553 at least concurrently for Fin 573.

**Fin 574 - Portfolio Management: Issues and Performance Assessment (2)**

This course is a continuation of Fin 573. Students will continue the responsibility of managing a real-dollar portfolio that was initiated in Fin 573. In addition, assessing and reporting on portfolio performance, and presenting a quarterly report to the investment community, will be an integral aspect of this course. This is the second course in a two-class course sequence.
Offered winter, spring, and summer terms. Also offered for undergraduate-level credit as Fin 474 and may be taken only once for credit.

Prerequisite: Fin 473 for 474, Fin 573 for 574.

Finn 599 - Real Estate Finance and Investment (3)
Application of finance and economic principles to analysis of real estate finance and investments. Emphasis on the development of problem solving capabilities through the use of computer application programs. Special attention is given to risk analysis, alternative mortgage instruments, hedging techniques, and the tax effects of real estate investment.

Prerequisite: Fin 551 or Fin 513 or USP 598 or equivalent. This course may only be taken once for credit.

Finn - Finnish

Finn 101 - First-year Finnish (4)
Beginning Finnish. Emphasis on communication skills: listening, speaking, reading, writing. This is the first course in a sequence of three: Fin 101, Fin 102, and Fin 103.

Finn 102 - First-year Finnish (4)
Beginning Finnish. Emphasis on communication skills: listening, speaking, reading, writing. This is the second course in a sequence of three: Fin 101, Fin 102, and Fin 103.

Finn 103 - First-year Finnish (4)
Beginning Finnish. Emphasis on communication skills: listening, speaking, reading, writing. This is the third course in a sequence of three: Fin 101, Fin 102, and Fin 103.

Finn 199 - Special Studies (1-5)
(Credit to be arranged.)

Finn 201 - Second-year Finnish (4)
Intensive review of basics introduced in first-year courses and further development of communication skills. This is the first course in a sequence of three: Finn 201, Finn 202, and Finn 203. Recommended prerequisite: Finn 103.

Finn 202 - Second-year Finnish (4)
Intensive review of basics introduced in first-year courses and further development of communication skills. This is the second course in a sequence of three: Finn 201, Finn 202, and Finn 203. Recommended prerequisite: Finn 103.

Finn 203 - Second-year Finnish (4)
Intensive review of basics introduced in first-year courses and further development of communication skills. This is the third course in a sequence of three: Finn 201, Finn 202, and Finn 203. Recommended prerequisite: Finn 103.

Finn 299 - Special Studies (1-5)
(Credit to be arranged.)

FPA - Fine and Performing Arts

FPA 101 - Perspectives in the Arts (4)
An introduction to elementary French. Emphasis on listening comprehension and oral practice, including the elements of grammar, vocabulary building, and elementary readings. This is the first course in a sequence of three: Fr 101, Fr 102, and Fr 103.

Fr 101 - First-year French (4)
An introduction to elementary French. Emphasis on listening comprehension and oral practice, including the elements of grammar, vocabulary building, and elementary readings. This is the first course in a sequence of three: Fr 101, Fr 102, and Fr 103.

Fr 102 - First-year French (4)
An introduction to elementary French. Emphasis on listening comprehension and oral practice, including the elements of grammar, vocabulary building, and elementary readings. This is the second course in a sequence of three: Fr 101, Fr 102, and Fr 103.

Fr 103 - First-year French (4)
An introduction to elementary French. Emphasis on listening comprehension and oral practice, including the elements of grammar, vocabulary building, and elementary readings. This is the third course in a sequence of three: Fr 101, Fr 102, and Fr 103.

Fr 105 - French Film (1)
Initiation to French culture and listening skills through short lectures in English and feature length film screenings in French (with English subtitles). Cannot be taken simultaneously with Fr 305.

Fr 150 - First-year French (Intensive) (6)
A two-term course covering the content of Fr 101, 102, 103.
Fr 151 - First-year French (Intensive) (6)
A two-term course covering the content of Fr 101, 102, 103.

Fr 199 - Special Studies (1-12)
(Credit to be arranged.)

Fr 201 - Second-year French (4)
Intensive review of basic materials introduced in First-Year French and further development of communication skills. This is the first course in a sequence of three: Fr 201, Fr 202, and Fr 203. Recommended prerequisite: Fr 103.

Fr 202 - Second-year French (4)
Intensive review of basic materials introduced in First-Year French and further development of communication skills. This is the second course in a sequence of three: Fr 201, Fr 202, and Fr 203. Recommended prerequisite: Fr 103.

Fr 203 - Second-year French (4)
Intensive review of basic materials introduced in First-Year French and further development of communication skills. This is the third course in a sequence of three: Fr 201, Fr 202, and Fr 203. Recommended prerequisite: Fr 103.

Fr 299 - Special Studies (1-12)
(Credit to be arranged.)

Fr 301 - Third-year French (4)
Development of speaking, listening, reading and writing skills and a review of grammar through study of appropriate texts, conversation, activities, and written assignments. This is the first course in a sequence of three: Fr 301, Fr 302, and Fr 303. Recommended prerequisite: Fr 203.

Fr 302 - Third-year French (4)
Development of speaking, listening, reading and writing skills and a review of grammar through study of appropriate texts, conversation, activities, and written assignments. This is the second course in a sequence of three: Fr 301, Fr 302, and Fr 303. Recommended prerequisite: Fr 203.

Fr 303 - Third-year French (4)
Development of speaking, listening, reading and writing skills and a review of grammar through study of appropriate texts, conversation, activities, and written assignments. This is the third course in a sequence of three: Fr 301, Fr 302, and Fr 303. Recommended prerequisite: Fr 203.

Fr 305 - Topics in French Film (4)
Focus on conversation and writing skills through the viewing and discussion of films. Topics may include: the history of French and Francophone cinema; the history of France through film. Recommended prerequisite: Fr 203 and 4 hours of 300-level French.

Fr 320 - French for the Working World (4)
Intensive application of language for advanced everyday proficiency, career exploration, job seeking and development of an actual student-run company. Participants will practice and improve their language skills by using them to develop product ideas, conduct market research and sales campaigns, manage company finances and plan the future of the enterprise. Expected preparation: Fr 203 or equivalent proficiency.

Fr 325 - French Phonetics and Phonology (4)
Introduction to the sounds of French: their place and manner of articulation (phonetics) as well as how they pattern with respect to each other and as influenced by morphological and syntactic factors (phonology). Expected preparation: Fr 301 or Fr 302.

Fr 326 - French Conversation (4)
Developing speaking and listening skills in French. Some grammar review and readings to stimulate discussions.
Prerequisite: Fr 203.

Fr 330 - Topics in Culture and Civilization (4)
The development of French life, thought, and arts of different periods, from the Middle Ages to the 20th century: for example, Pre-Revolution, Revolution through 19th century, and contemporary. Recommended prerequisite: Fr 203. 4 hours of 300-level French.

Fr 335 - 19th Century France (4)
French politics, society and their reflections in literature from the Revolution to the 3rd Republic (1789-1890s). Main themes: ancien regime, Revolution, French political instability, rise of the bourgeoisie, growth of working class, reflection of these themes in major literary works. Conducted in English.

Fr 335U - 19th Century France (4)
French politics, society and their reflections in literature from the Revolution to the 3rd Republic (1789-1890s). Main themes: ancien regime, Revolution, French political instability, rise of the bourgeoisie, growth of working class, reflection of these themes in major literary works. Conducted in English.

Fr 340 - Fundamentals of French Literary Studies (4)
An introduction to the study of French literature, its forms and genres, techniques, and themes, and to French literary criticism. Course focus is on the practice of writing literary commentary, analysis and criticism in French. To be taken prior to or concurrently with Fr 341, 342, or 343.
Expected preparation: Fr 203; Fr 301 or Fr 302 strongly recommended.

Fr 341 - Introduction to French Literature (4)
French literature from the Middle Ages to the present. Poetry, theater, and prose readings from representative authors. 341: medieval and Renaissance; 342: 17th and 18th centuries; 343: 19th and 20th. This is the first course in a sequence of three: Fr 341, Fr 342, and Fr 343.
Prerequisite: Fr 340 must be taken concurrently or prior to enrollment in 341, 342, or 343. Expected preparation: Fr 203; Fr 301 or Fr 302 strongly recommended.

Fr 341U - Introduction to French Literature (4)
French literature from the Middle Ages to the present. Poetry, theater, and prose readings from representative authors. 341: medieval and Renaissance; 342: 17th and 18th centuries; 343: 19th and 20th. This is the first course in a sequence of three: Fr 341, Fr 342, and Fr 343.
Prerequisite: Fr 340 must be taken concurrently or prior to enrollment in 341, 342, or 343. Expected preparation: Fr 203; Fr 301 or Fr 302 strongly recommended.
Fr 342 - Introduction to French Literature (4)
French literature from the Middle Ages to the present. Poetry, theater, and prose readings from representative authors. 341: medieval and Renaissance; 342: 17th and 18th centuries; 343: 19th and 20th. This is the second course in a sequence of three: Fr 341, Fr 342, and Fr 343.
Prerequisite: Fr 340 must be taken concurrently or prior to enrollment in 341, 342, or 343. Expected preparation: Fr 203; Fr 301 or Fr 302 strongly recommended.

Fr 342U - Introduction to French Literature (4)
French literature from the Middle Ages to the present. Poetry, theater, and prose readings from representative authors. 341: medieval and Renaissance; 342: 17th and 18th centuries; 343: 19th and 20th. This is the second course in a sequence of three: Fr 341, Fr 342, and Fr 343.
Prerequisite: Fr 340 must be taken concurrently or prior to enrollment in 341, 342, or 343. Expected preparation: Fr 203; Fr 301 or Fr 302 strongly recommended.

Fr 343 - Introduction to French Literature (4)
French literature from the Middle Ages to the present. Poetry, theater, and prose readings from representative authors. 341: medieval and Renaissance; 342: 17th and 18th centuries; 343: 19th and 20th. This is the third course in a sequence of three: Fr 341, Fr 342, and Fr 343.
Prerequisite: Fr 340 must be taken concurrently or prior to enrollment in 341, 342, or 343. Expected preparation: Fr 203; Fr 301 or Fr 302 strongly recommended.

Fr 343U - Introduction to French Literature (4)
French literature from the Middle Ages to the present. Poetry, theater, and prose readings from representative authors. 341: medieval and Renaissance; 342: 17th and 18th centuries; 343: 19th and 20th. This is the third course in a sequence of three: Fr 341, Fr 342, and Fr 343.
Prerequisite: Fr 340 must be taken concurrently or prior to enrollment in 341, 342, or 343. Expected preparation: Fr 203; Fr 301 or Fr 302 strongly recommended.

Fr 399 - Special Studies (1-8)
(Credit to be arranged.)

Fr 401 - Research (1-6)
(Credit to be arranged.)

Fr 404 - Cooperative Education/Internship (1-12)
(Credit to be arranged.)

Fr 405 - Reading and Conference (1-6)
(Credit to be arranged.)

Fr 407 - Seminar (1-6)
(Credit to be arranged.)

Fr 408 - Workshop (1-6)
(Credit to be arranged.)

Fr 409 - Practicum (1-12)
(Credit to be arranged.)

Fr 410 - Selected Topics (1-6)
(Credit to be arranged.)

Fr 411 - Advanced French (4)
Special problems of French grammar; selected writing and reading assignments and discussion. Recommended prerequisite: Fr 303.

Fr 412 - Advanced French (4)
Special problems of French grammar; selected writing and reading assignments and discussion. Recommended prerequisite: Fr 303.

Fr 414 - Advanced French Grammar (4)
A systematic approach to the study of French grammar and syntax for majors and prospective teachers. Also offered for graduate-level credit as Fr 514 and may be taken only once for credit. Prerequisite: Fr 303.

Fr 415 - Business French (4)
Advanced work in the language of business and economics. Recommended prerequisite: Fr 303.

Fr 417 - Translation (4)
Special problems of translating between French and English based on a variety of texts, both literary and non-literary. Also offered for graduate-level credit as Fr 517 and may be taken only once for credit. Recommended prerequisite: Fr 303.

Fr 419 - Medieval French Literature (4)
Selected works of Old French literature (reading in modern French translation). Also offered for graduate-level credit as Fr 519 and may be taken only once for credit. Recommended prerequisites: at least 8 credits from Fr 341, 342, 343.

Fr 420 - Renaissance French Literature (4)
Selected works of literature representative of the French Renaissance. Also offered for graduate-level credit as Fr 520 and may be taken only once for credit. Recommended prerequisites: at least 8 credits from Fr 341, 342, 343.

Fr 421 - Seventeenth-century French Literature (4)
Readings from major classical writers from the era of Louis XIV. Also offered for graduate-level credit as Fr 521 and may be taken only once for credit. Recommended prerequisites: at least 8 credits from Fr 341, 342, or Fr 343.

Fr 423 - Eighteenth-century French Literature (4)
Readings, analysis and critique of the major works written in the Age of Enlightenment. Also offered for graduate-level credit as Fr 523 and may be taken only once for credit. Recommended prerequisites: at least 8 credits from Fr 341, 342, or 343.

Fr 427 - Nineteenth-century French Literature (4)
Selected works of prose, poetry, and drama from the 19th century writers. Also offered for graduate-level credit as Fr 527 and may be taken only once for credit. Recommended prerequisites: at least 8 credits from Fr 341, 342, or 343.

Fr 428 - Nineteenth-century French Literature (4)
Selected works of prose, poetry, and drama from the 19th century writers. Also offered for graduate-level credit as Fr 527 and may be taken only once for credit. Recommended prerequisites: at least 8 credits from Fr 341, 342, or 343.

Fr 433 - Twentieth-century French Literature (4)
Readings in poetry, drama, and prose. Also offered for graduate-level credit as Fr 533 and may be taken only once for credit. Recommended prerequisites: at least 8 credits from Fr 341, 342, or 343.
Fr 494 - French Linguistics (4)

A practical application of linguistics to modern French. Emphasis on a contrastive analysis of the structures of French and English. Recommended prerequisites: Fr 303 and 4 credits of linguistics.

Fr 501 - Research (1-9)

(Credit to be arranged.)

Fr 503 - Thesis (1-9)

(Credit to be arranged.)

Fr 504 - Cooperative Education/Internship (1-9)

(Credit to be arranged.)

Fr 505 - Reading and Conference (1-6)

(Credit to be arranged.)

Fr 507 - Seminar (1-6)

(Credit to be arranged.)

Fr 508 - Workshop (1-6)

(Credit to be arranged.)

Fr 509 - Practicum (1-9)

(Credit to be arranged.)

Fr 510 - Selected Topics (1-6)

(Credit to be arranged.)

Fr 511 - Advanced French (4)

Special problems of French grammar; selected writing and reading assignments and discussion. Recommended prerequisite: Fr 303.

Fr 512 - Advanced French (4)

Special problems of French grammar; selected writing and reading assignments and discussion. Recommended prerequisite: Fr 303.

Fr 514 - Advanced French Grammar (4)

A systematic approach to the study of French grammar and syntax for majors and prospective teachers. Also offered as undergraduate-level credit as Fr 414 and may be taken only once for credit. Prerequisite: Fr 303.

Fr 515 - Business French (4)

Advanced work in the language of business and economics. Recommended prerequisite: Fr 303.

Fr 517 - Translation (4)

Special problems of translating between French and English based on a variety of texts, both literary and non-literary. Also offered for undergraduate-level credit as Fr 417 and may be taken only once for credit. Recommended prerequisite: Fr 303.

Fr 519 - Medieval French Literature (4)

Selected works of Old French literature (reading in modern French translation). Also offered for undergraduate-level credit as Fr 419 and may be taken only once for credit. Recommended prerequisites: at least 8 credits from Fr 341, 342, 343.

Fr 520 - Renaissance French Literature (4)

Selected works of literature representative of the French Renaissance. Also offered for undergraduate-level credit as Fr 420 and may be taken only once for credit. Recommended prerequisites: at least 8 credits from Fr 341, 342, 343.

Fr 521 - Seventeenth-century French Literature (4)

Readings from major classical writers from the era of Louis XIV. Also offered for undergraduate-level credit as Fr 421 and may be taken only once for credit. Recommended prerequisites: at least 8 credits from Fr 341, 342, 343.

Fr 523 - Eighteenth-century French Literature (4)

Reading, analysis and critique of the major works written in the Age of Enlightenment. Also offered for undergraduate-level credit as Fr 423 and may be taken only once for credit. Recommended prerequisites: at least 8 credits from Fr 341, 342, or 343.

Fr 527 - Nineteenth-century French Literature (4)

Selected works of prose, poetry, and drama from the 19th century writers. Also offered for undergraduate-level credit as Fr 427 and may be taken only once for credit. Recommended prerequisites: at least 8 credits from Fr 341, 342, or 343.

Fr 528 - Nineteenth-century French Literature (4)

Selected works of prose, poetry, and drama from the 19th century writers. Also offered for graduate-level credit as Fr 528 and may be taken only once for credit. Recommended prerequisites: at least 8 credits from Fr 344, 345, or 346.
Fr 533 - Twentieth-century French Literature (4)
Readings in poetry, drama, and prose. Also offered for undergraduate-level credit as Fr 433 and may be taken only once for credit. Recommended prerequisites: at least 8 credits from Fr 341, 342, or 343.

Fr 534 - Twentieth-century French Literature (4)
Readings in poetry, drama, and prose. Recommended prerequisites: at least 8 credits from Fr 341, 342, or 343.

Fr 535 - Francophone Literature of the 20th Century (4)
Readings in 20th century literature of French expression from outside metropolitan France: i.e., Africa, Quebec, and the Caribbean. Also offered for undergraduate-level credit as Fr 435 and may be taken only once for credit. Recommended prerequisite: at least 8 credits from Fr 341, Fr 342, or Fr 343.

Fr 541 - Major Works in Translation (4)
Study of texts representative of major French authors, periods, themes or genres in translation: such topics as Classical drama, Realism, contemporary novel, Flaubert, and Camus. Readings, lectures, and discussions in English. Also offered for undergraduate-level credit as Fr 441 and may be taken only once for credit. Recommended prerequisite: 4 credits of upper division literature.

Fr 542 - Medieval Works in Translation (4)
Study of texts from the French middle ages. Readings, lectures, and discussions in English. Recommended prerequisite: 4 credits of upper division literature.

Fr 551 - French Poetry (4)
Study of French poetry. Analysis of form and content.

Fr 552 - French Drama (4)
Critical study of representative works of French drama.

Fr 553 - French Prose (4)
Study of representative works of French fiction according to genre, period, theme, or authors.

Fr 584 - French Stylistics (4)
A study of vocabulary, sentence structure, metaphor, and other elements that characterize the style of a writer, a period, or a movement.

Fr 590 - History of the French Language (4)
Study of the development of the French language in terms of phonological, morphological, and syntactical changes. Also offered for undergraduate-level credit as Fr 490 and may be taken only once for credit. Recommended prerequisite: Fr 303.

Fr 594 - French Linguistics (4)
Introduction to the basic concepts of linguistics and their application to the French language. Emphasis on practical analysis of the sound and the grammatical systems. Brief survey of the historical development, followed by an analysis of the phonetics, phonemics, morphology, and syntax of modern French. Conducted in English. Recommended prerequisites: Fr 303, 325.

Fr 597 - Applied French Linguistics (4)
A practical application of linguistics to modern French. Emphasis on a contrastive analysis of the structures of French and English. Recommended prerequisites: Fr 303 and 4 credits of linguistics.

Geog - Geography

Geog 199 - Special Studies (1-3)
See department for course description. (Credit to be arranged.)

Geog 210 - Physical Geography (4)
An introduction to the physical elements of geography and the environment in which people live. The focus is on natural processes that create physical diversity on the earth. Major topics are weather and climate, vegetation and soils, landforms, ecosystems, their distribution and significance.

Geog 230 - Environment and Society: Global Perspectives (4)
An introduction to the ways in which humans, acting through social constraints and structures, have lived in and modified their environment. The spatial patterns produced from human activities (such as population growth, transportation systems, urban structure, economic development, resource use and management, and the evolution of political patterns) are considered in a global context. Case studies from several world regions illustrate the processes by which humans modify their world to create distinctive cultural landscapes.

Geog 240 - Geography of Wine (4)
Core geographic concepts and themes through the framework of the geography of wine. Exploration of the physical and cultural dimension of grape-growing and wine-making, ranging from historical geography to climate and climate change and cultural geography.

Geog 299 - Special Studies (1-4)
(Credit to be arranged.)

Geog 310 - Climate and Water Resources (4)
An inquiry-based examination of the principal controls on climate and hydrology, with emphasis on processes and interactions; students will do fieldwork, data analysis, and laboratory work. Crosslisted as: Sci 333.

Geog 310U - Climate and Water Resources (4)
An inquiry-based examination of the principal controls on climate and hydrology, with emphasis on processes and interactions; students will do fieldwork, data analysis, and laboratory work. Recommended prerequisite: Natural Science Inquiry. Also listed as Sci 333; course may be taken only once for credit. Crosslisted as: Sci 333U.

Geog 311 - Climatology (4)
A study of the physical processes which comprise the climatic system, from the global scale to the local scale. Particular attention is given to the nature of climatic variability, its causes, and its implications for human activity.

Geog 311U - Climatology (4)
A study of the physical processes which comprise the climatic system, from the global scale to the local scale. Particular attention is given to the nature of climatic variability, its causes, and its implications for human activity. Recommended prerequisite: Geog 210.

Geog 312 - Climate Variability (4)
Examines the role of climate variability in the Pacific Northwest, including the nature of natural and human-induced variability and the effects on water resources of the region.
Students will learn by gathering data, analyzing the data, and reporting on their results. Reading and discussion will accompany the data/laboratory portions of the course. Includes laboratory and/or fieldwork.

Geog 312U - Climate Variability (4)
Examines the role of climate variability in the Pacific Northwest, including the nature of natural and human-induced variability and the effects on water resources of the region. Students will learn by gathering data, analyzing the data, and reporting on their results. Reading and discussion will accompany the data/laboratory portions of the course. Includes laboratory and/or fieldwork. Recommended prerequisite: Natural Science Inquiry. Also listed as Sci 334; course may be taken only once for credit.

Geog 313 - Biogeography (4)
This course examines current and historical distributions of organisms as explained by environmental and biological factors. The goal of the course is to improve student understanding of how multiple factors such as soil properties, natural selection, climate change, and human activities shape the geography of organisms at local to global scales.

Geog 313U - Biogeography (4)
This course examines current and historical distributions of organisms as explained by environmental and biological factors. The goal of the course is to improve student understanding of how multiple factors such as soil properties, natural selection, climate change, and human activities shape the geography of organisms at local to global scales. Recommended prerequisite: Geog 210.

Geog 314 - Severe Weather (4)
Examination of severe and hazardous weather processes such as hurricanes, tornadoes, and thunderstorms. Evaluation of the human-environment interaction of severe weather and the potential consequences of global climate change on the intensity and location of severe weather phenomena.

Geog 314U - Severe Weather (4)
Examination of severe and hazardous weather processes such as hurricanes, tornadoes, and thunderstorms. Evaluation of the human-environment interaction of severe weather and the potential consequences of global climate change on the intensity and location of severe weather phenomena. Recommended prerequisite: Geog 210.

Geog 320 - Geomorphic Processes (4)
Study of landform processes at the earth’s surface including the work of water, wind, and ice in erosion, transportation, and deposition on land and sea. The significance of geomorphic processes to human activities is included. A one- to two-day weekend field trip is required. Three lectures; one 3-hour lab. This course is the same as G 374; course may be taken only once for credit. Expected preparation: Geog 210 and Mth 111.
Corequisite: Geog 320L. Crosslisted as: G 374.

Geog 320L - Geomorphic Processes Lab (0)
Lab for Geog 320.
Corequisite: Geog 320.

Geog 321 - Mt. Hood (4)
Examines the physical and cultural systems that shape Mt. Hood and investigates some of the issues that arise when a mostly wild mountain abuts an urban area. Class involves lecture, discussion, research, and field trips.

Geog 322 - Alpine Environments (4)
Examines the geoecology of high elevation environments in tropical, mid-latitude, and high altitude regions with a special emphasis on the alpine environment of the Pacific Northwest. The primary objective is to promote understanding of the features and processes found in alpine areas including their susceptibility to human alteration. Topics include an examination of high elevation weather and climate, geomorphology, soils, and vegetation. Recommended prerequisite: Geog 210.

Geog 322U - Alpine Environments (4)
Examines the geoecology of high elevation environments in tropical, mid-latitude, and high altitude regions with a special emphasis on the alpine environment of the Pacific Northwest. The primary objective is to promote understanding of the features and processes found in alpine areas including their susceptibility to human alteration. Topics include an examination of high elevation weather and climate, geomorphology, soils, and vegetation. Recommended prerequisite: Geog 210.

Geog 331 - Geography of Globalization (4)
An introduction to theories and concepts related to global economic activities within agriculture, manufacturing, service and information industries. The course focuses on global processes and linkages between local and global economies. Includes geographic distributions, areal interaction among urban and regional economies, the processes of regional economic development, and international economic linkages.

Geog 331U - Geography of Globalization (4)
An introduction to theories and concepts related to global economic activities within agriculture, manufacturing, service and information industries. The course focuses on global processes and linkages between local and global economies. Includes geographic distributions, areal interaction among urban and regional economies, the processes of regional economic development, and international economic linkages. Recommended prerequisite: upper-division standing.

Geog 332 - Urban Geography (4)
Introduction to the geographical factors affecting the development of the modern city. Topics include urban systems and the location of cities; residential, commercial, and industrial structure; social and physical characteristics of cities; the built environment; the urban economy; and planning the urban environment.

Geog 332U - Urban Geography (4)
Introduction to the geographical factors affecting the development of the modern city. Topics include urban systems and the location of cities; residential, commercial, and industrial structure; social and physical characteristics of cities; the built environment; the urban economy; and planning the urban environment. Recommended prerequisite: upper division standing.

Geog 333 - Weather (4)
Introductory course in the atmospheric environment providing a comprehensive understanding of atmospheric structure and the changes over time that result in the
weather we experience. Topics include, atmospheric moisture (fog, rain, clouds), atmospheric stability and cloud development, air pressure and winds, air masses and fronts, and hurricanes and tornados. This course is the same as Ph 333; course may be taken only once for credit. Recommended: upper division standing or Geog 210.

Crosslisted as: Ph 333.

Geog 333U - Weather (4)
Introductory course in the atmospheric environment providing a comprehensive understanding of atmospheric structure and the changes over time that result in the weather we experience. Topics include, atmospheric moisture (fog, rain, clouds), atmospheric stability and cloud development, air pressure and winds, air masses and fronts, and hurricanes and tornados. This course is the same as Ph 333; course may be taken only once for credit. Recommended: upper division standing or Geog 210.

Crosslisted as: Ph 333U.

Geog 340 - Global Water Issues and Sustainability (4)
Examines the availability and quality of freshwater resources around the world. Includes the global water cycle, human use and modifications of global water systems, effects of climate change on global freshwater, water policy in international rivers, and sustainable water resource management. Focuses on case studies in major international rivers.

Geog 340U - Global Water Issues and Sustainability (4)
Examines the availability and quality of freshwater resources around the world. Includes the global water cycle, human use and modifications of global water systems, effects of climate change on global freshwater, water policy in international rivers, and sustainable water resource management. Focuses on case studies in major international rivers.

Geog 345 - Resource Management (4)
Survey of natural resources, their occurrence, and their management. Primary focus will be on the United States, with case studies from other countries and regions.

Geog 345U - Resource Management (4)
Survey of natural resources, their occurrence, and their management. Primary focus will be on the United States, with case studies from other countries and regions. Recommended prerequisite: upper division standing.

Geog 346 - World Population and Food Supply (4)
An introduction to the dynamics of the current national and international problems associated with rapid population growth, unemployment, major population migrations, shortages of food and other critical commodities, and the present and potential adjustments to these situations. Recommended prerequisite: upper division standing.

Geog 346U - World Population and Food Supply (4)
An introduction to the dynamics of the current national and international problems associated with rapid population growth, unemployment, major population migrations, shortages of food and other critical commodities, and the present and potential adjustments to these situations. Recommended prerequisite: upper division standing.

Geog 347 - Environmental Issues and Action (4)
Examines environmentalism as a phenomenon reflecting cultural appraisals of nature and society’s relationship to it. Explores the history and ideology of the environmental movement, and investigates the contemporary structure, concerns, effects, critiques, and directions of environmentalism.

Geog 347U - Environmental Issues and Action (4)
Examines environmentalism as a phenomenon reflecting cultural appraisals of nature and society’s relationship to it. Explores the history and ideology of the environmental movement, and investigates the contemporary structure, concerns, effects, critiques, and directions of environmentalism. Recommended prerequisite: upper division standing.

Geog 348 - Cultural and Political Ecology (4)
Introduction to geographic perspectives on cultural and political ecology. Investigates cultural adaptation and environmental change from an ecological perspective, focusing on biomes, cultural adaptations within them, and the political structures that influence cultural adaptations. Particular attention to traditional societies and the impacts of development.

Geog 348U - Cultural and Political Ecology (4)
Introduction to geographic perspectives on cultural and political ecology. Investigates cultural adaptation and environmental change from an ecological perspective, focusing on biomes, cultural adaptations within them, and the political structures that influence cultural adaptations. Particular attention to traditional societies and the impacts of development. Recommended prerequisite: upper-division standing.

Geog 349 - Mountain Geography (4)
Investigates mountain environments as distinctive biophysical and cultural realms. Surveys the human occupation and use of mountainous areas of Eurasia, Africa, the Pacific, and the Americas, and explores highland-lowland interactions in selected cases. Topics include cultural adaptation, mountain resource management and policy, and developments and its impacts in highland environments.

Geog 349U - Mountain Geography (4)
Investigates mountain environments as distinctive biophysical and cultural realms. Surveys the human occupation and use of mountainous areas of Eurasia, Africa, the Pacific, and the Americas, and explores highland-lowland interactions in selected cases. Topics include cultural adaptation, mountain resource management and policy, and developments and its impacts in highland environments.

Geog 350 - Geography of World Affairs (4)
Examines the major world trouble spots in light of long-standing political-geographical rivalries, including ethnic group rivalries, economic disparities, and conflicting historical claims. Particular emphasis will be placed on political organization of territory, nationalism, boundary conflicts, colonialism, and, where relevant, metropolitan political fragmentation.

Geog 350U - Geography of World Affairs (4)
Examines the major world trouble spots in light of long-standing political-geographical rivalries, including ethnic group rivalries,
economic disparities, and conflicting historical claims. Particular emphasis will be placed on political organization of territory, nationalism, boundary conflicts, colonialism, and, where relevant, metropolitan political fragmentation. Recommended prerequisite: upper division standing.

**Geog 351 - Pacific Northwest (4)**
Study of the Pacific Northwest as a region of the United States. Overview of the region and its relationship to other parts of the world will be followed by an analysis of the physical environment, natural resources, agriculture, manufacturing, transportation, population, and urban development. Special attention will be paid to theoretical developments in contemporary regional geography issues. Recommended prerequisite: upper division standing.

**Geog 351U - Pacific Northwest (4)**
Study of the Pacific Northwest as a region of the United States. Overview of the region and its relationship to other parts of the world will be followed by an analysis of the physical environment, natural resources, agriculture, manufacturing, transportation, population, and urban development. Special attention will be paid to theoretical developments in contemporary regional geography issues. Recommended prerequisite: upper division standing.

**Geog 352 - The Himalaya and Tibet (4)**
Survey of the physical and cultural landscapes of the Himalaya-Hindukush and the Tibetan Plateau. It investigates not only the places and peoples within it but also ideas about it and their influence on its history and present situation. Recommended prerequisite: upper division standing.

**Geog 352U - The Himalaya and Tibet (4)**
Survey of the physical and cultural landscapes of the Himalaya-Hindukush and the Tibetan Plateau. It investigates not only the places and peoples within it but also ideas about it and their influence on its history and present situation. Recommended prerequisite: upper division standing.

**Geog 353 - Pacific Rim (4)**
Provides a comprehensive look at the events and people shaping the last 150 years of Asia-Pacific history and relates them to Pacific Basin relationships today. Reveals how, from the 19th century onward, modern nations have emerged from the rich and varied cultures and society of Pacific Asia. Particular emphasis is placed on political and economic geography of East Asia in relation to contemporary American and Japanese interests in the region.

**Geog 353U - Pacific Rim (4)**
Provides a comprehensive look at the events and people shaping the last 150 years of Asia-Pacific history and relates them to Pacific Basin relationships today. Reveals how, from the 19th century onward, modern nations have emerged from the rich and varied cultures and society of Pacific Asia. Particular emphasis is placed on political and economic geography of East Asia in relation to contemporary American and Japanese interests in the region. Recommended prerequisite: upper division standing.

**Geog 354 - Europe (4)**
Focuses on the changing economic and political geography of Europe, post World War II, and the adjustments to changing world conditions. Analysis of the geographic conditions of individual countries. Examines their population, urban and rural settlements, physical geography, agriculture, and industry. Recommended prerequisite: upper division standing.

**Geog 354U - Europe (4)**
Focuses on the changing economic and political geography of Europe, post World War II, and the adjustments to changing world conditions. Analysis of the geographic conditions of individual countries. Examines their population, urban and rural settlements, physical geography, agriculture, and industry. Recommended prerequisite: upper division standing.

**Geog 355 - Landscapes of Spain (4)**
Study of the landscapes of Spain, both the physical and the cultural, and the search for unity in a nation long characterized by diversity. Overview of the climate and topography, the historical development of regional distinctions, and the cultural and political conditions that shape the nation in the 21st century.

**Geog 355U - Landscapes of Spain (4)**
Study of the landscapes of Spain, both the physical and the cultural, and the search for unity in a nation long characterized by diversity. Overview of the climate and topography, the historical development of regional distinctions, and the cultural and political conditions that shape the nation in the 21st century. Recommended prerequisite: upper division standing.

**Geog 356 - Russia and Its Neighbors (4)**
An exploration of the USSR by topic and region. The course looks at the nature and significance of the country's huge size and diversified physical environment; examines the origins and implications of its multinational character; and analyses patterns of agricultural production and industry, with consideration of the distinctive institutions that have shaped them.

**Geog 356U - Russia and Its Neighbors (4)**
An exploration of the USSR by topic and region. The course looks at the nature and significance of the country's huge size and diversified physical environment; examines the origins and implications of its multinational character; and analyses patterns of agricultural production and industry, with consideration of the distinctive institutions that have shaped them.

**Geog 360 - Latin America (4)**
Analysis of changing landscapes and lifeways in Latin America. The focus is on physical, cultural, and economic forces that have interacted to create a distinctive world region. Particular attention is given to the impact of large scale issues such as global climate change, trade, the environment, and the debt crisis on the lands and lives of everyday people in the region.

**Geog 360U - Latin America (4)**
Analysis of changing landscapes and lifeways in Latin America. The focus is on physical, cultural, and economic forces that have interacted to create a distinctive world region. Particular attention is given to the impact of large scale issues such as global climate change, trade, the environment, and the debt crisis on the lands and lives of everyday people in the region. Recommended prerequisite: upper division standing.

**Geog 363 - Africa (4)**
A survey course on the physical and human geography of the continent of Africa, focusing on the variability of the physical landscape, including geomorphology, vegetation, and climate and on the patterns and implications of cultural diversity.
Examine links between natural resources, economic development, and environmental management on location, national and regional scales. Case studies from various countries and regions will be used.

Geog 363U - Africa (4)
A survey course on the physical and human geography of the continent of Africa, focusing on the variability of the physical landscape, including geomorphology, vegetation, and climate and on the patterns and implications of cultural diversity. Examine links between natural resources, economic development, and environmental management on location, national and regional scales. Case studies from various countries and regions will be used.

Geog 364 - The Middle East (4)
A survey of the physical and cultural landscapes of southwestern Asia and North Africa, emphasizing the interaction of environmental factors and dynamic economic and political forces in the region as a whole. Problems common to the nations of the region are examined, including the difficulties of political cohesion, urbanization, and ecological impacts of tradition and contemporary land-use practices.

Geog 364U - The Middle East (4)
A survey of the physical and cultural landscapes of southwestern Asia and North Africa, emphasizing the interaction of environmental factors and dynamic economic and political forces in the region as a whole. Problems common to the nations of the region are examined, including the difficulties of political cohesion, urbanization, and ecological impacts of tradition and contemporary land-use practices. Recommended prerequisite: upper division standing.

Geog 366 - Historical Geography of North America (4)
Survey of the evolving geography of North America during the last four centuries; the formation and growth of regions from the initial period of European exploration and colonization to the present. Topic include the acquisition of geographical knowledge; cultural transfer and acculturation; westward expansion; resource exploitation; regional and national integration; and landscape change. Recommended prerequisite: upper division standing.

Geog 366U - Historical Geography of North America (4)
Survey of the evolving geography of North America during the last four centuries; the formation and growth of regions from the initial period of European exploration and colonization to the present. Topic include the acquisition of geographical knowledge; cultural transfer and acculturation; westward expansion; resource exploitation; regional and national integration; and landscape change. Recommended prerequisite: upper division standing.

Geog 368 - United States and Canada (4)
Survey of the contemporary regional geography of the United States and Canada including physical environments, cultural landscapes, and economic activities. Topics will include the development of distinctive regions; the changing spatial relationships between the location of resources and population; urban/rural disparities; and national and regional roles in the global economy.

Geog 368U - United States and Canada (4)
Survey of the contemporary regional geography of the United States and Canada including physical environments, cultural landscapes, and economic activities. Topics will include the development of distinctive regions; the changing spatial relationships between the location of resources and population; urban/rural disparities; and national and regional roles in the global economy. Recommended prerequisite: upper division standing.

Geog 370 - Maps and Geographic Information (4)
Examines maps as communicative tools, analytical devices, and cultural artifacts. Fundamental concepts such as scale, projection, coordinate systems, are reviewed and applied to higher level measurement and analytical methods with thematic and topographic maps. The data requirements and information content of maps are considered with respect to emerging digital geo-spatial technology.

Corequisite: Geog 380L.

Geog 380U - Maps and Geographic Information (4)
Examines maps as communicative tools, analytical devices, and cultural artifacts. Fundamental concepts such as scale, projection, coordinate systems, are reviewed and applied to higher level measurement and analytical methods with thematic and topographic maps. The data requirements and information content of maps are considered with respect to emerging digital geo-spatial technology.

Corequisite: Geog 380L.

Geog 397 - Visualization of Spatial Data (4)
The use of graphic modes for visualizing data as a fundamental tool in geography and other disciplines. Topics include graphic types, bar charts, line graphs, pie graphs, time series, flow charts, organizational charts, scales of measurement, data transformations, and index numbers. Special emphasis on elements of graphic design and design choices in spreadsheets.

Prerequisite: upper-division standing.

Geog 399 - Special Studies (1-6)
See department for course description. (Credit to be arranged.)

Geog 399U - Special Studies (1-4)
(Credit to be arranged.)

Geog 401 - Research (0-6)
See department for course description. (Credit to be arranged.) Consent of instructor.

Geog 403 - Thesis (1-6)
See department for course description. (Credit to be arranged) Consent of instructor.

Geog 404 - Cooperative Education/Internship (0-12)
See department for course description. (Credit to be arranged.) Pass/no pass only. Consent of instructor.

Geog 405 - Reading and Conference (0-6)
See department for course description. (Credit to be arranged.) Consent of instructor.
Geog 407 - Seminar (0-6)
See department for course description. (Credit to be arranged.)

Geog 409 - Practicum (0-12)
See department for course description. (Credit to be arranged.) Pass/no pass only. Consent of instructor.

Geog 410 - Selected Topics (0-6)
See department for course description. (Credit to be arranged.) Pass/no pass only.

Geog 411 - Global Climate Change Science and Socio-environmental Impact Assessment (4)
Examination of the physical processes of climate change at multiple scales. Evaluation of the potential impacts of climate change on ecosystem, water, human health in urban and non-urban environments. Understanding of integrated models for climate change impact assessment. Also offered for graduate-level credit as Geog 515 and may be taken only once for credit.

Prerequisite: Senior or graduate standing in Geography.

Geog 412 - Biogeography of Pacific Northwest (4)
This course examines the regional biogeography of current and historical plant and animal distributions. Course topics include the abiotic constraints to species distributions, ecological processes (succession and disturbance), and biogeographic theory and management. The course includes two mandatory all day field trips. Also offered for graduate-level credit as Geog 512 and may be taken only once for credit. Recommended prerequisites: Geog 210, 313 or Bio 357.

Geog 413 - Hydrology (4)
A detailed analysis of the physical processes of the hydrologic cycle, emphasizing an applied approach for the purposes of resource management and environmental analysis: precipitation, runoff processes, evapotranspiration, soil water, flooding and floodplain utilization, and techniques of hydrologic data analysis. Also offered for graduate-level credit as Geog 514 and may be taken only once for credit. Recommended prerequisites: Geog 210 and Stat 243 and 244.

Geog 415 - Soils and Land Use (4)
The origin, development and distribution of soils and the significance of soil to man. Examines the importance of soil to landforms, vegetation, and ecological development. Major emphasis is given to land use potentials and limitations on various kinds of soils with focus on urban and agricultural settings. There are two half-day field trips. Also offered for graduate-level credit as Geog 515 and may be taken only once for credit. Recommended prerequisite: Geog 210.

Geog 418 - Landscape Ecology (4)
Examines the structure, function, and change of natural and human-modified communities at the scale between individual communities and regional biomes. Focuses on spatial patterns and processes as they relate to the patch mosaic of interacting ecological communities. Also offered for graduate-level credit as Geog 518; this is the same course as ESM 418 and may be taken only once for credit. Recommended prerequisites: Geog 313 or Bio 357. Upper-division standing required.

Crosslisted as: ESM 418.

Geog 420 - Field Methods in Physical Geography (4)
Introduces students to field methods in physical geography. The goal is to familiarize the student with field techniques including research and sampling design, field measurements and mapping, data analysis and report writing and the use of field equipment. Field and lab exercises will focus on the examination of natural patterns and processes and those resulting from human activity. Techniques involving vegetation sampling, soil description, microclimatic conditions, and geomorphologic processes will be covered. Also offered for graduate-level credit as Geog 520 and may be taken only once for credit. Recommended prerequisite: eight hours of upper division physical geography or graduate standing.

Geog 425 - Field Methods in Human Geography (4)
Field observation, description, and analysis in human geography. Students explore landscapes in Portland metropolitan region through a series of exercises including sampling techniques, field mapping, and photography supplemented by data collection from census records, tax records, historic maps and photographs, and published accounts about places. Also offered for graduate-level credit as Geog 525 and may be taken only once for credit. Recommended prerequisites: 8 credits of upper division or regional geography or graduate standing.

Geog 430 - Cultural Geography (4)
Explores cultural geography as a subfield of the discipline. Examines the major organizing concepts of cultural geography --cultural ecology, region, landscape, symbolism. Focus is on how these concepts are used in cultural geography, the evolution of research in each area, how the use and application of the concepts have changed over time, current theoretical developments, and how this subfield of geography fits into the discipline. Includes field work project. Also offered for graduate-level credit as Geog 530 and may be taken only once for credit. Recommended prerequisite: Geog 230.

Geog 432 - Urban Landscapes (4)
Analysis of the contemporary built environment of metropolitan areas; social, cultural, political, and economic forces that have given cities their form and image; historical processes of urban development; and messages and meanings of our surroundings. Focuses on common urban landscapes as well as designed spaces. In individual and group projects, students analyze the interrelationships of land use, residential density, street patterns, homes and yards, and open spaces in the Portland metropolitan area. Also offered for graduate-level credit as Geog 532 and may be taken only once for credit. Recommended prerequisite: Geog 332.

Geog 442 - Sustainable Cities (4)
Examines efforts to create sustainable cities in the United States, drawing on ideas from around the world. Explores complexities of balancing social justice with environmental health and economic vitality. Topics include urban ecology and green city initiatives, new ideas in designing the built environment, growth management and land use planning, community-based efforts to improve quality of life, and challenges of globalization for local economies. Includes fieldwork project, half-day field trips, and community based learning option. Also offered for graduate-level credit as Geog 542 and may be taken only once for credit.
only once for credit. Recommended prerequisites: Geog 332 or Geog 432; USP 311 or USP 313.

**Geog 445 - Resource Management Topics (4)**

Focuses on advanced topics in administration and management of natural resources. Reviews historical issues and today’s struggles for a sustainable approach in the development of natural resource policy. Emphasis will vary, e.g. water resources, energy resources, public lands. Course may be repeated once for a total of 8 credits with different topics. Also offered as graduate-level credit as Geog 545 and may be taken only once for credit.

Prerequisite: upper-division standing.

**Geog 446 - Water Resource Management (4)**

Analysis of the distribution, use and management of water resources, emphasizing the systems of water rights, legislation, and regulations which govern water resources. Issues of water development and water quality are examined. Focus is on U.S. water resource, with case studies from other countries and regions. Examples are drawn from local, regional, and international water resource management schemes. Also offered for graduate-level credit as Geog 546 and may be taken only once for credit. Recommended prerequisite: upper-division or graduate standing.

**Geog 447 - Urban Streams (4)**

Investigates issues associated with human dimensions of streams in the urban environment. Topics include the role of streams in the built environment, human modifications of stream systems and their consequences (e.g., disappearing streams, channelization), and local community responses to restore and protect urban streams. Case studies are drawn from national and international streams as well as local streams in the Portland metropolitan area. Also offered for graduate-level credit as Geog 547 and may be taken only once for credit. Recommended prerequisite: Geog 345 or Geog 347 or Geog 432/532.

**Geog 448 - The Urban Forest (4)**

Examination of issues related to trees in the urban environment. Topics will include the values and roles of urban trees, species identification, site selection, spatial structure of the urban forest, management and regulation of urban trees, and techniques for evaluating the health of the urban forest and public and governmental efforts to promote urban trees. Also offered for graduate-level credit as Geog 548 and may be taken only once for credit. Recommended prerequisite: one or more of Geog 313, Geog 413/513, Geog 415/515, Geog 432/532, Bi 357.

**Geog 449 - Geography of Food (4)**

This class explores the geography of food: food production, distribution, preparation, and consumption; food politics, markets, urban and commercial farming; food movements, connections of cuisines and regions, and foods and farming in the Pacific Northwest. Also offered as graduate-level credit as Geog 549 and may be taken only once for credit.

Prerequisite: Upper-division or graduate standing.

**Geog 450 - Geography of Portland (4)**

Analysis of the geography of Portland. Lectures and guided field work. Students will work on group projects on specific topics involving research, data collection and analysis with oral and written presentations. Recommended prerequisite: 12 credits of geography.

**Geog 453 - Japan (4)**

The course focuses on the major geographical factors underlying Japan’s rise to industrial and economic greatness in the present day. The main emphasis is upon the rise and development of cities and industry, the agricultural characteristics of Japan, and its contemporary trade relationship with the Pacific Northwest. Also offered for graduate-level credit as Geog 553 and may be taken only once for credit. Recommended prerequisite: Geog 353.

**Geog 462 - Sense of Place (4)**

Places are created by people, infused with meaning, and tied to personal experience. This course explores meaning in landscapes and identity in places, regions, and localities. It looks at places through three frameworks: place description and depiction (in media images, popular narratives, scholarly writings, photography, and art), the meanings and messages of places; and our personal experience and connections to places. Topics include: the distinctiveness of places, bioregional influences, personal memory and place, creating meaning in places, global-local tensions, territoriality, and contested places. Also offered for graduate-level credit as Geog 562 and may be taken only once for credit.

**Geog 465 - Tuscany: Sustainability in City and Country (4)**

Explores historic and contemporary connections between city and country in Tuscany within a framework of environmental, social, and economic sustainability. Topics include rural land use, sustainable agriculture and forestry, food production and food networks, agritourism, landscape stewardship, urban design, and alternative energy production. Examines international transferability of sustainability concepts. Also offered for graduate-level credit as Geog 565 and may be taken only once for credit. Expected preparation: junior/senior or graduate class standing; relevant experience; permission of instructor.

**Geog 475 - Digital Compilation and Database Design (4)**

Class in applied geographic information systems featuring the project development of new digital geo-spatial data. Students learn to digitize existing map documents, design information databases to be used with these data, and employ a standardized documentation format to describe the database. Also offered for graduate-level credit as Geog 575 and may be taken only once for credit.

Prerequisite: Geog 488/588, prior or concurrent enrollment in Geog 492/592.

**Geog 480 - Remote Sensing and Image Analysis (4)**

Visual interpretation and measurement from remotely sensed imagery used for mapping and spatial data development. Analysis of air photo pattern recognition and scale distortions. Examination of various satellite imaging platforms and product characteristics. Also offered for graduate-level credit as Geog 580 and may be taken only once for credit.

Prerequisite: Geog 380.
Geog 481 - Digital Image Analysis I: Introduction (4)

Interpretation and measurement from digital satellite imagery used for interpretation of the earth's surface. Analysis will be largely based on the application of computer technology to imagery. The emphasis will be on natural landforms and vegetative cover. Also offered for graduate-level credit as Geog 581 and may be taken only once for credit. Recommended prerequisite: Geog 480/580.

Geog 482 - Digital Image Analysis II: Advanced Remote Sensing (4)

Advanced topics in digital remote sensing including image classification methods for geographic information extraction, digital change detection methods for measuring land use/land cover change, and advanced algorithms for digital image analysis. Includes computer exercises in classification and change detection using leading image processing software packages. Also offered for graduate-level credit as Geog 582 and may be taken only once for credit.

Prerequisite: Geog 481/581.

Geog 484 - Cartographic Applications of GIS (4)

Provides a general introduction to GIS by focusing on the mapmaking capabilities of GIS software. Topics include basic cartographic principles of visual communication and representation, how to turn geographic datasets into effective maps both for print and the web, and how to critique maps. Also offered for graduate-level credit as Geog 584 and may be taken only once for credit.

Prerequisite: Geog 380.

Geog 485 - Map Design and Production (4)

Introduction to the planning and execution of a map, with special emphasis on the arrangement of its graphic elements. Students will use cartographic and illustration software in the compilation, design and production of maps. Also offered as graduate-level credit as Geog 585 and may be taken only once for credit.

Prerequisite: Geog 380 and Geog 484/584 or Geog 488/588 or USP 591.

Geog 488 - Geographic Information Systems I: Introduction (4)

Introduces the general principles and application of Geographic Information Systems (GIS). Topics include geographic data models, the nature of geographic data, databases, data collection, map making, and spatial analysis techniques. Students will use GIS software to complete a series of computer lab exercises that demonstrate a variety of approaches to the analysis and display of spatial data. Students enrolling in this class also must register for a computer lab section. Also listed as USP 591. Also offered for graduate-level credit as Geog 588 and may be taken only once for credit.

Prerequisite: Geog 380 or equivalent experience. Corequisite: Geog 488L. Crosslisted as: USP 591.

Geog 488L - GIS Lab (0)

Lab for G 488.

Geog 489 - Building a GIS Database with GPS (4)

Develops knowledge and skills necessary to use the global positioning systems (GPS) to collect, process, and use geographic data. GPS theory and techniques through field survey experiences. Collect and integrate spatial and nonspatial data within an integrated geographic information system (GIS) framework. Also offered for graduate-level credit as Geog 589 and may be taken only once for credit.

Prerequisite: Geog 488/588.

Geog 490 - GIS Programming (4)

Introduction to GIS programming languages for customizing applications and streamlining spatial analysis. Topics include GIS software environment, programming syntax and styles, interface customization, GIS routines and functions, and basic algorithms. Programming lab included. Also offered for graduate-level credit as Geog 590 and may be taken only once for credit.

Prerequisite: Geog 488/588.

Geog 492 - Geographic Information Systems II: Advanced GIS (4)

Analysis and applications of geographic information systems concepts and technology to land planning and management issues. The multipurpose land information systems concept is used as an organizing device for spatial registration of data layers to achieve data sharing and compatibility among functions. User needs assessment and systems design provides the basis for systems procurement, implementation, and use. Students enrolling in this class also must register for a computer lab section. Also listed as USP 592. Also offered for graduate-level credit as Geog 592 and may be taken only once for credit.

Prerequisite: Geog 488/588 or USP 591. Corequisite: Geog 492L. Crosslisted as: USP 592.

Geog 492L - GIS II Lab (0)

Lab for G 492.

Geog 493 - Digital Terrain Analysis (4)

Introduction to the theory and methods of the generation, compilation, analysis, and applications of digital elevation data. Topics include GIS terrain data models, digital photogrammetry, LiDAR data processing, terrain surface analysis, terrain visualization, and watershed delineation. Computer lab included. Also offered for graduate-level credit as Geog 593 and may be taken only once for credit.

Prerequisite: Geog 488 or Geog 588.

Geog 494 - GIS for Water Resources (4)

Applications of Geographic Information Systems (GIS) in hydrology and water resource management. Topics include hydrologic networks, watershed characterization by GIS, river channel modeling with GIS, GIS modeling and visualization of hydrographic data, time-series water resource data representation and analysis in GIS, and issues in the applications of GIS for watershed management. Also offered for graduate-level credit as Geog 594 and may be taken only once for credit. Recommended prerequisites: Geog 380, Geog 414, and Geog 488.

Geog 495 - Maps, Models, and GIS (4)

Analysis and display of spatial data, emphasizing environmental questions within the framework of the raster data model. Topics include an introduction to general systems theory, the nature of models, cartographic model development, model implementation procedures, map algebra, vector/raster data conversion, guidelines
for symbol usage, and the incorporation of digital remote sensing data into map models. Also offered for graduate-level credit as Geog 595 and may be taken only once for credit.

Prerequisite: Geog 380; Geog 485/585 recommended.

Geog 496 - Visualization of Spatial Data (4)
The use of graphics as a fundamental descriptive and explanatory tool for visualizing data in geography and other disciplines. Topics include graphic types, their design and meaning, visualization of spatial data surfaces, cartographic counterparts to descriptive statistics, data classification techniques, data transformations, index numbers, and spatial graphics software. Also offered for graduate-level credit as Geog 596 and may be taken only once for credit. Recommended: 12 hours of coursework in geography.

Geog 497 - Spatial Quantitative Analysis (4)
Introduction to the principles of inferential spatial statistics. Topics include point pattern analysis, spatial autocorrelation, spatial interpolation, and multivariate spatial data analysis. Also offered for graduate-level credit as Geog 597 and may be taken only once for credit. 

Prerequisite: Geog 496 or Geog 596; Stat 243 and Stat 244.

Geog 501 - Research (0-9)
See department for course description. (Credit to be arranged.) Consent of instructor.

Geog 503 - Thesis (0-9)
See department for course description. (Credit to be arranged) Consent of instructor.

Geog 504 - Cooperative Education/Internship (0-9)
See department for course description. Consent of instructor. (Credit to be arranged.)

Geog 505 - Reading and Conference (0-6)
See department for course description. (Credit to be arranged.) Consent of instructor.

Geog 507 - Seminar (0-6)
See department for course description. (Credit to be arranged.)

Geog 509 - Practicum (0-12)
See department for course description. (Credit to be arranged.) Consent of instructor.

Geog 510 - Selected Topics (0-6)
See department for course description. (Credit to be arranged.)

Geog 512 - Global Climate Change Science and Socio-environmental Impact Assessment (4)
Examination of the physical processes of climate change at multiple scales. Evaluation of the potential impacts of climate change on ecosystem, water, human health in urban and non-urban environments. Understanding of integrated models for climate change impact assessment. Also offered for undergraduate-level credit as Geog 412 and may be taken only once for credit.

Geog 513 - Biogeography of Pacific Northwest (4)
This course examines the regional biogeography of current and historical plant and animal distributions. Course topics include the abiotic constraints to species distributions, ecological processes (succession and disturbance), and biogeographic theory and management. The course includes two mandatory all day field trips. Also offered for undergraduate-level credit as Geog 413 and may be taken only once for credit. Recommended prerequisites: Geog 210, 313 or Bio 357.

Geog 514 - Hydrology (4)
A detailed analysis of the physical processes of the hydrologic cycle, emphasizing an applied approach for the purposes of resource management and environmental analysis: precipitation, runoff processes, evapotranspiration, soil water, flooding and floodplain utilization, and techniques of hydrologic data analysis. Also offered for undergraduate-level credit as Geog 414 and may be taken only once for credit. Recommended prerequisites: Geog 210 and Stat 243 and 244.

Geog 515 - Soils and Land Use (4)
The origin, development and distribution of soils and the significance of soil to man. Examines the importance of soil to landforms, vegetation, and ecological development. Major emphasis is given to land use potentials and limitations on various kinds of soils with focus on urban and agricultural settings. There are two half-day field trips. Also offered for undergraduate-level credit as Geog 415 and may be taken only once for credit. Recommended prerequisite: Geog 210.

Geog 518 - Landscape Ecology (4)
Examines the structure, function, and change of natural and human-modified communities at the scale between individual communities and regional biomes. Focuses on spatial patterns and processes as they relate to the patch mosaic of interacting ecological communities. Also offered for undergraduate-level credit as Geog 418; this is the same course as ESM 518 and may be taken only once for credit. Recommended prerequisites: Geog 313 or Bi 357. Upper-division standing required.

Crosslisted as: ESM 518.

Geog 520 - Field Methods in Physical Geography (4)
Introduces students to field methods in physical geography. The goal is to familiarize the student with field techniques including research and sampling design, field measurements and mapping, data analysis and report writing and the use of field equipment. Field and lab exercises will focus on the examination of natural patterns and processes and those resulting from human activity. Techniques involving vegetation sampling, soil description, microclimatic conditions, and geomorphologic processes will be covered. Also offered for undergraduate-level credit as Geog 420 and may be taken only once for credit. Recommended prerequisite: eight hours of upper division physical geography or graduate standing.

Geog 521 - Geographic Thought (4)
Geography as a professional field. The first half of the course deals with the history of geographic thought and literature. The second half focuses on the role of geography among the arts and sciences and on more
recent developments in the field. Required of all graduate students in geography.

Geog 522 - Research Design (4)
A guided program for preparing graduate research papers and theses in geography. Attention is given to formulating topics, developing hypotheses, determining researchability, acquiring and analyzing data, developing conclusions, and organizing and writing reports. Required of all graduate students in geography.

Geog 523 - Geographic Research and Applications (1)
Applications of theory and method in geography through discussion of faculty research; relates theoretical underpinnings of the discipline to faculty research agendas, broadens perspectives on geographical research questions. Required of all geography graduate students.

Geog 525 - Field Methods in Human Geography (4)
Field observation, description, and analysis in human geography. Students explore landscapes in Portland metropolitan region through a series of exercises including sampling techniques, field mapping, and photography supplemented by data collection from census records, tax records, historic maps and photographs, and published accounts about places. Also offered for undergraduate-level credit as Geog 425 and may be taken only once for credit. Recommended prerequisites: 8 credits of upper division or regional geography or graduate standing.

Geog 530 - Cultural Geography (4)
Explores cultural geography as a subfield of the discipline. Examines the major organizing concepts of cultural geography --cultural ecology, region, landscape, symbolism. Focus is on how these concepts are used in cultural geography, the evolution of research in each area, how the use and application of the concepts have changed over time, current theoretical developments, and how this subfield of geography fits into the discipline. Includes field work project. Also offered for undergraduate-level credit as Geog 430 and may be taken only once for credit. Recommended prerequisite: Geog 230.

Geog 532 - Urban Landscapes (4)
Analysis of the contemporary built environment of metropolitan areas; social, cultural, political, and economic forces that have given cities their form and image; historical processes of urban development; and messages and meanings of our surroundings. Focuses on common urban landscapes as well as designed spaces. In individual and group projects, students analyze the interrelationships of land use, residential density, street patterns, homes and yards, and open spaces in the Portland metropolitan area. Also offered for undergraduate-level credit as Geog 432 and may be taken only once for credit. Recommended prerequisite: Geog 333.

Geog 542 - Sustainable Cities (4)
Examines efforts to create sustainable cities in the United States, drawing on ideas from around the world. Explores complexities of balancing social justice with environmental health and economic vitality. Topics include urban ecology and green city initiatives, new ideas in designing the built environment, growth management and land use planning, community-based efforts to improve quality of life, and challenges of globalization for local economies. Includes fieldwork project, half-day field trips, and community based learning option. Also offered for undergraduate-level credit as Geog 442 and may be taken only once for credit. Recommended prerequisites: Geog 332 or Geog 432; USP 311 or USP 313.

Geog 545 - Resource Management Topics (4)
Focuses on advanced topics in administration and management of natural resources. Reviews historical issues and today’s struggles for a sustainable approach in the development of natural resource policy. Emphasis will vary, e.g. water resources, energy resources, public lands. Course may be repeated once for a total of 8 credits with different topics. Also offered as undergraduate-level credit as Geog 445 and may be taken only once for credit. Prerequisite: upper-division standing.

Geog 546 - Water Resource Management (4)
Analysis of the distribution, use and management of water resources, emphasizing the systems of water rights, legislation, and regulations which govern water resources. Issues of water development and water quality are examined. Focus is on U.S. water resource, with case studies from other countries and regions. Examples are drawn from local, regional, and international water resource management schemes. Also offered for undergraduate-level credit as Geog 446 and may be taken only once for credit. Recommended prerequisite: Geog 446.

Geog 547 - Urban Streams (4)
Investigates issues associated with human dimensions of streams in the urban environment. Topics include the role of streams in the built environment, human modifications of stream systems and their consequences (e.g., disappearing streams, channelization), and local community responses to restore and protect urban streams. Case studies are drawn from national and international streams as well as local streams in the Portland metropolitan area. Also offered for undergraduate-level credit as Geog 447 and may be taken only once for credit. Recommended prerequisite: Geog 345 or Geog 347 or Geog 432/532.

Geog 548 - The Urban Forest (4)
Examination of issues related to trees in the urban environment. Topics will include the values and roles of urban trees, species identification, site selection, spatial structure of the urban forest, management and regulation of urban trees, and techniques for evaluating the health of the urban forest and public and governmental efforts to promote urban trees. Also offered for undergraduate-level credit as Geog 448 and may be taken only once for credit. Recommended prerequisite: one or more of Geog 313, Geog 413/513, Geog 415/515, Geog 432/532, Bi 357.

Geog 549 - Geography of Food (4)
This class explores the geography of food: food production, distribution, preparation, and consumption; food politics, markets, urban and commercial farming; food movements, connections of cuisines and regions, and foods and farming in the Pacific Northwest. Also offered as undergraduate-level credit as Geog 449 and may be taken only once for credit.
Prerequisite: Upper-division or graduate standing.

**Geog 553 - Japan (4)**

The course focuses on the major geographical factors underlying Japan’s rise to industrial and economic greatness in the present day. The main emphasis is upon the rise and development of cities and industry, the agricultural characteristics of Japan, and its contemporary trade relationship with the Pacific Northwest. Also offered for undergraduate-level credit as Geog 453 and may be taken only once for credit. Recommended prerequisite: Geog 353.

**Geog 562 - Sense of Place (4)**

Places are created by people, infused with meaning, and tied to personal experience. This course explores meaning in landscapes and identity in places, regions, and localities. It looks at places through three frameworks: place description and depiction (in media images, popular narratives, scholarly writings, photography, and art); the meanings and messages of places; and our personal experience and connections to places. Topics include: the distinctiveness of places, bioregional influences, personal memory and place, creating meaning in places, global-local tensions, territoriality, and contested places. Also offered for undergraduate-level credit as Geog 462 and may be taken only once for credit.

**Geog 565 - Tuscany: Sustainability in City and Country (4)**

Explores historic and contemporary connections between city and country in Tuscany within a framework of environmental, social, and economic sustainability. Topics include rural land use, sustainable agriculture and forestry, food production and food networks, agritourism, landscape stewardship, urban design, and alternative energy production. Examines international transferability of sustainability concepts. Also offered for undergraduate-level credit as Geog 465 and may be taken only once for credit. Expected preparation: junior/senior or graduate class standing; relevant experience; permission of instructor.

**Geog 575 - Digital Compilation and Database Design (4)**

Class in applied geographic information systems featuring the project development of new digital geo-spatial data. Students learn to digitize existing map documents, design information databases to be used with these data, and employ a standardized documentation format to describe the database. Also offered for undergraduate-level credit as Geog 475 and may be taken only once for credit. Prerequisite: Geog 488/588, prior or concurrent enrollment in Geog 492/592.

**Geog 580 - Remote Sensing and Image Analysis (4)**

Visual interpretation and measurement from remotely sensed imagery used for mapping and spatial data development. Analysis of air photo pattern recognition and scale distortions. Examination of various satellite imaging platforms and product characteristics. Also offered for undergraduate-level credit as Geog 480 and may be taken only once for credit. Prerequisite: Geog 380.

**Geog 581 - Digital Image Analysis I: Introduction (4)**

Interpretation and measurement from digital satellite imagery used for interpretation of the earth’s surface. Analysis will be largely based on the application of computer technology to imagery. The emphasis will be on natural landforms and vegetative cover. Also offered for undergraduate-level credit as Geog 481 and may be taken only once for credit. Recommended prerequisite: Geog 480/580.

**Geog 582 - Digital Image Analysis II: Advanced Remote Sensing (4)**

Advanced topics in digital remote sensing including image classification methods for geographic information extraction, digital change detection methods for measuring land use/land cover change, and advanced algorithms for digital image analysis. Includes computer exercises in classification and change detection using leading image processing software packages. Also offered for undergraduate-level credit as Geog 482 and may be taken only once for credit. Prerequisite: Geog 481/581.

**Geog 584 - Cartographic Applications of GIS (4)**

Provides a general introduction to GIS by focusing on the mapmaking capabilities of GIS software. Topics include basic cartographic principles of visual communication and representation, how to turn geographic datasets into effective maps both for print and the web, and how to critique maps. Also offered for undergraduate-level credit as Geog 484 and may be taken only once for credit. Prerequisite: Geog 380.

**Geog 585 - Map Design and Production (4)**

Introduction to the planning and execution of a map, with special emphasis on the arrangement of its graphic elements. Students will use cartographic illustration software in the compilation, design and production of maps. Also offered as undergraduate-level credit as Geog 485 and may be taken only once for credit. Prerequisite: Geog 380 and Geog 484/584 or Geog 488/588 or USP 591.

**Geog 588 - Geographic Information Systems I: Introduction (4)**

Introduces the general principles and application of Geographic Information Systems (GIS). Topics include geographic data models, the nature of geographic data, databases, data collection, mapmaking, and spatial analysis techniques. Students will use GIS software to complete a series of computer lab exercises that demonstrate a variety of approaches to the analysis and display of spatial data. Students enrolling in this class also must register for a computer lab section. This is the same course as USP 591. Also offered for undergraduate-level credit as Geog 488 and may be taken only once for credit. Prerequisite: Geog 380 or equivalent experience. Corequisite: Geog 588L. Crosslisted as: USP 591.

**Geog 588L - GIS Lab (0)**

Lab for G 588.

**Geog 589 - Building a GIS Database with GPS (4)**

Develops knowledge and skills necessary to use the global positioning systems (GPS) to collect, process, and use geographic data. GPS theory and techniques through field survey experiences. Collect and integrate spatial and nonspatial data within an integrated geographic information system (GIS) framework. Also offered for
undergraduate-level credit as Geog 489 and may be taken only once for credit.
Prerequisite: Geog 488/588.

Geog 590 - GIS Programming (4)

Introduction to GIS programming languages for customizing applications and streamlining spatial analysis. Topics include GIS software environment, programming syntax and styles, interface customization, GIS routines and functions, and basic algorithms. Programming lab included. Also offered for undergraduate-level credit as Geog 490 and may be taken only once for credit.
Prerequisite: Geog 488/588.

Geog 592 - Geographic Information Systems II: Advanced GIS (4)

Analysis and applications of geographic information systems concepts and technology to land planning and management issues. The multipurpose land information systems concept is used as an organizing device for spatial registration of data layers to achieve data sharing and compatibility among functions. User needs assessment and systems design provides the basis for systems procurement, implementation, and use. Students enrolling in this class also must register for a computer lab section. This is the same course as USP 592. Also offered for undergraduate-level credit as Geog 492 and may be taken only once for credit.
Prerequisite: Geog 488/588 or USP 591. Corequisite: Geog 592L. Crosslisted as: USP 592.

Geog 592L - GIS II Lab (0)

Lab for G 592.

Geog 593 - Digital Terrain Analysis (4)

Introduction to the theory and methods of the generation, compilation, analysis, and applications of digital elevation data. Topics include GIS terrain data models, digital photogrammetry, LiDAR data processing, terrain surface analysis, terrain visualization, and watershed delineation. Computer lab included. Also offered for undergraduate-level credit as Geog 493 and may be taken only once for credit.
Prerequisite: Geog 488 or Geog 588.

Geog 594 - GIS for Water Resources (4)

Applications of Geographic Information Systems (GIS) in hydrology and water resource management. Topics include hydrologic networks, watershed characterization by GIS, river channel modeling with GIS, GIS modeling and visualization of hydrographic data, time-series water resource data representation and analysis in GIS, and issues in the applications of GIS for watershed management. Also offered for undergraduate-level credit as Geog 494 and may be taken only once for credit. Recommended prerequisites: Geog 380, Geog 414, and Geog 488.

Geog 595 - Maps, Models, and GIS (4)

Analysis and display of spatial data, emphasizing environmental questions within the framework of the raster data model. Topics include an introduction to general systems theory, the nature of models, cartographic model development, model implementation procedures, map algebra, vector-to-raster data conversion, guidelines for symbol usage, and the incorporation of digital remote sensing data into map models. Also offered for undergraduate-level credit as Geog 495 and may be taken only once for credit.
Prerequisite: Geog 380; Geog 485/585 recommended.

Geog 596 - Visualization of Spatial Data (4)

The use of graphics as a fundamental descriptive and explanatory tool for visualizing data in geography and other disciplines. Topics include graphic types, their design and meaning, visualization of spatial data surfaces, cartographic counterparts to descriptive statistics, data classification techniques, data transformations, index numbers, and spatial graphics software. Also offered for undergraduate-level credit as Geog 496 and may be taken only once for credit. Recommended: 12 hours of coursework in geography.

Geog 597 - Spatial Quantitative Analysis (4)

Introduction to the principles of inferential spatial statistics. Topics include point pattern analysis, spatial autocorrelation, spatial interpolation, and multivariate spatial data analysis. Also offered for undergraduate-level credit as Geog 497 and may be taken only once for credit.
Prerequisite: Geog 496 or Geog 596; Stat 243 and Stat 244.

Geog 601 - Research (0-12)

See department for course description. (Credit to be arranged.)

Geog 603 - Dissertation (0-12)

See department for course description. (Credit to be arranged.)

Geog 605 - Reading and Conference (0-8)

See department for course description. (Credit to be arranged.)

Geog 607 - Seminar (0-12)

See department for course description. (Credit to be arranged.)

Geog 694 - Methods and Models in Ecosystem Services (4)

Evaluates changing ecosystem services in a holistic way, drawing multiple disciplines, including ecology, economics, engineering, and geographical and spatial sciences. Introduces methods and models from multiple disciplines to analyze ecosystem services across biophysical, social, economic, and cultural contexts. Provides an interdisciplinary foundation for evaluating ecosystem services. This is the same course as Mgmt 694 and may be taken only once for credit.
Crosslisted as: Mgmt 694.

Ger - Germanic Languages

Ger 101 - First-year German (4)

Beginning German. Emphasis on communication skills: listening, speaking, reading, writing. This is the first course in a sequence of three: Ger 101, Ger 102, and Ger 103.

Ger 102 - First-year German (4)

Beginning German. Emphasis on communication skills: listening, speaking, reading, writing. This is the second course in a sequence of three: Ger 101, Ger 102, and Ger 103.

Ger 103 - First-year German (4)

Beginning German. Emphasis on communication skills: listening, speaking, reading, writing. This is the third course in a sequence of three: Ger 101, Ger 102, and Ger 103.
Ger 203 - Third-Year German (4)
Continued development of speaking, listening, reading and writing skills through study of appropriate texts, conversation, activities, and written assignments. This is the third course in a sequence of three: Ger 301, Ger 302, and Ger 303. Expected preparation: Ger 203.

Ger 320 - German for the Working World (4)

Ger 325 - German Phonetics and Phonology (4)
Introduction to the sounds of German: their place and manner of articulation (phonetics) as well as how they pattern with respect to each other and as influenced by morphological and syntactic factors (phonology). Conducted in English. Recommended prerequisite: Ger 203.

Ger 330 - Topics in Culture and Civilization (4)
Study of the historical development of life, thought, and the arts in German-speaking lands in times and places such as the Middle Ages, 19th-century Vienna, 20th-century Berlin, the Weimar period, the present, or in fields such as film. Expected preparation: Ger 203.

Ger 340 - Fundamentals of German Literary Studies (4)
An introduction to the study of German literature. Lectures and discussion on German prosody, genres, fundamentals of literary analysis and criticism. Recommended prerequisite: Ger 203.

Ger 341 - Introduction to German Literature (4)
Readings from representative German authors from the Middle Ages to the present. This is the first course in a sequence of two: Ger 341 and Ger 342. Recommended prerequisites: Ger 203.

Ger 341U - Introduction to German Literature (4)
Readings from representative German authors from the Middle Ages to the present. This is the first course in a sequence of two: Ger 341 and Ger 342. Recommended prerequisites: Ger 203.

Ger 342 - Introduction to German Literature (4)
Readings from representative German authors from the Middle Ages to the present. This is the second course in a sequence of two: Ger 341 and Ger 342. Recommended prerequisites: Ger 203.

Ger 349 - Special Studies (1-6)
(Credit to be arranged.)

Ger 401 - Research (1-9)
(Credit to be arranged.)

Ger 404 - Cooperative Education/Internship (1-12)
(Credit to be arranged.)

Ger 405 - Reading and Conference (1-12)
(Credit to be arranged.)

Ger 407 - Seminar (1-12)
(Credit to be arranged.)

Ger 408 - Workshop (1-12)
(Credit to be arranged.)

Ger 409 - Practicum (1-12)
(Credit to be arranged.)

Ger 410 - Selected Topics (1-12)
(Credit to be arranged.)

Ger 410U - Selected Topics (4)
(Credit to be arranged.)

Ger 411 - Advanced German (4)
Special features of German; selected writing and reading assignments, discussion. This is the first course in a sequence of two: Ger 411 and Ger 412. Also offered for graduate-level credit as Ger 511 and may be taken only once for credit. Recommended prerequisite: Ger 302.

Ger 412 - Advanced German (4)
Special features of German; selected writing and reading assignments, discussion. This is the second course in a sequence of two: Ger 411 and Ger 412. Also offered for graduate-
level credit as Ger 512 and may be taken only once for credit. Recommended prerequisite: Ger 302.

Ger 414 - Advanced German Grammar (4)
Structural review of German morphology and syntax. Also offered for graduate-level credit as Ger 528 and may be taken only once for credit. Recommended prerequisites: at least 8 credits from Ger 340, Ger 341, or Ger 342.

Ger 415 - Business German (4)
Advanced work in the language of business and economics. Recommended prerequisite: Ger 302.

Ger 420 - German for the Working World (Advanced) (4)
Intensive application of language for upper-level advanced proficiency, career exploration, and employment. Exploration of German-speaking companies: business practices, corporate structure, human resources, product development, marketing, finance, law, cultural aspects. Development of skills in different modes of communication as appropriate in business settings. Hands-on development of simulated or actual student-run companies.
Prerequisite: Ger 301 or equivalent whether taken previously or concurrently.

Ger 421 - German Short Prose (4)
Study of the German Novelle and other shorter prose of the 19th and 20th centuries. Also offered for graduate-level credit as Ger 521 and may be taken only once for credit. Recommended prerequisites: at least 8 credits from Ger 340, Ger 341, or Ger 342.

Ger 422 - 18th Century German Literature (4)
Study of the poetry, drama, and prose of the German Enlightenment and the Sturm und Drang. Recommended prerequisites: at least 8 credits from Ger 340, 341, or 342. 

Ger 427 - The Age of Goethe (4)
Study of German poetry, drama, and prose from the Sturm und Drang and Classicism to the beginning of Romanticism. Also offered for graduate-level credit as Ger 527 and may be taken only once for credit. Expected preparation: at least 8 credits from Ger 340, Ger 341, or Ger 342.

Ger 428 - German Romanticism (4)
Study of the literature, art, and aesthetic theories of late 18th and 19th century Germany. Also offered for graduate-level credit as Ger 528 and may be taken only once for credit. Recommended prerequisites: at least 8 credits from Ger 340, Ger 341, or Ger 342.

Ger 429 - German Realism and Naturalism (4)
Study of the poetry, drama, and prose of the second half of the 19th century. Also offered for graduate-level credit as Ger 529 and may be taken only once for credit. Recommended prerequisites: at least 8 credits from Ger 340, Ger 341, or Ger 342.

Ger 433 - German Literature of the 20th Century (4)
Readings in modern poetry, drama, and prose. Ger 433/533: from the turn of the century to the end of World War II; Ger 434/534: from the post-war years to the present. This is the first course in a sequence of two: Ger 433 and Ger 434. Also offered for graduate-level credit as Ger 533 and may be taken only once for credit. Recommended prerequisites: at least 8 credits from Ger 340, Ger 341, or Ger 342.

Ger 434 - German Literature of the 20th Century (4)
Readings in modern poetry, drama, and prose. Ger 433/533: from the turn of the century to the end of World War II; Ger 434/534: from the post-war years to the present. This is the second course in a sequence of two: Ger 433 and Ger 434. Also offered for graduate-level credit as Ger 534 and may be taken only once for credit. Recommended prerequisites: at least 8 credits from Ger 340, Ger 341, or Ger 342.

Ger 441 - Major Works in Translation (4)
Study of selections from masterpieces of German literature in translation, such as Goethe, the Weimar period, German Intellectual History, Ancient Myth in German Literature. Readings, lectures, and discussions in English. Recommended prerequisite: 4 credits of upper division literature.
Ger 504 - Cooperative Education/Internship (1-12)
(Credit to be arranged.)

Ger 505 - Reading and Conference (1-12)
(Credit to be arranged.)

Ger 507 - Seminar (1-12)
(Credit to be arranged.)

Ger 508 - Workshop (1-12)
(Credit to be arranged.)

Ger 509 - Practicum (1-12)
(Credit to be arranged.)

Ger 510 - Selected Topics (1-12)
(Credit to be arranged.)

Ger 511 - Advanced German (4)
Special features of German; selected writing and reading assignments, discussion. This is the first course in a sequence of two: Ger 511 and Ger 512. Also offered for undergraduate-level credit as Ger 411 and may be taken only once for credit. Recommended prerequisite: Ger 302.

Ger 512 - Advanced German (4)
Special features of German; selected writing and reading assignments, discussion. This is the second course in a sequence of two: Ger 511 and Ger 512. Also offered for undergraduate-level credit as Ger 412 and may be taken only once for credit. Recommended prerequisite: Ger 302.

Ger 514 - Advanced German Grammar (4)
Structural review of German morphology and syntax. Also offered for undergraduate-level credit as Ger 414 and may be taken only once for credit. Recommended prerequisite: Ger 302.

Ger 521 - German Short Prose (4)
Study of the German Novelle and other shorter prose of the 19th and 20th centuries. Also offered for undergraduate-level credit as Ger 421 and may be taken only once for credit. Recommended prerequisites: at least 8 credits from Ger 340, Ger 341, or Ger 342.

Ger 522 - 18th Century German Literature (4)
Study of the poetry, drama, and prose of the German Enlightenment and the Sturm und Drang. Recommended prerequisites: at least 8 credits from Ger 340, 341, or 342.

Ger 527 - The Age of Goethe (4)
Study of German poetry, drama, and prose from the Sturm und Drang and Classicism to the beginning of Romanticism. Also offered for undergraduate-level credit as Ger 427 and may be taken only once for credit. Expected preparation: at least 8 credits from Ger 340, Ger 341, or Ger 342.

Ger 528 - German Romanticism (4)
Study of the literature, art, and aesthetic theories of late 18th and 19th century Germany. Also offered for undergraduate-level credit as Ger 428 and may be taken only once for credit. Recommended prerequisites: at least 8 credits from Ger 340, Ger 341, or Ger 342.

Ger 529 - German Realism and Naturalism (4)
Study of the poetry, drama, and prose of the second half of the 19th century. Also offered for undergraduate-level credit as Ger 429 and may be taken only once for credit. Recommended prerequisites: at least 8 credits from Ger 340, Ger 341, or Ger 342.

Ger 533 - German Literature of the 20th Century (4)
Readings in modern poetry, drama, and prose. Ger 433/533: from the turn of the century to the end of World War II; Ger 434/534: from the post-war years to the present. This is the first course in a sequence of two: Ger 533 and Ger 534. Also offered for undergraduate-level credit as Ger 433 and may be taken only once for credit. Recommended prerequisites: at least 8 credits from Ger 340, Ger 341, or Ger 342.

Ger 534 - German Literature of the 20th Century (4)
Readings in modern poetry, drama, and prose. Ger 433/533: from the turn of the century to the end of World War II; Ger 434/534: from the post-war years to the present. This is the second course in a sequence of two: Ger 533 and Ger 534. Also offered for undergraduate-level credit as Ger 434 and may be taken only once for credit. Recommended prerequisites: at least 8 credits from Ger 340, Ger 341, or Ger 342.

Ger 541 - Major Works in Translation (4)
Study of selections from masterpieces of German literature in translation, such as Goethe, the Weimar period, German Intellectual History, Ancient Myth in German Literature. Readings, lectures, and discussions in English. Also offered for undergraduate-level credit as Ger 441 and may be taken only once for credit. Recommended prerequisite: 4 credits of upper division literature.

Ger 542 - Medieval Works In Translation (4)
Study of texts from the German Middle Ages. Readings, lectures, and discussions in English. Recommended prerequisite: 4 credits of upper division literature.

Ger 551 - German Poetry (4)
Study of German lyric poetry. Analysis of form and content.

Ger 552 - German Drama (4)
Critical study of representative works of German drama.

Ger 553 - German Prose (4)
Study of representative works of German prose fiction.

Ger 554 - Middle High German (4)
Linguistic and literary study of representative Middle High German texts. Conducted in English, readings in German. Recommended prerequisite: Ger 302.

Ger 584 - German Stylistics (4)
A study of the stylistic aspects of fictional and nonfictional writings within the context of the cultural and philosophical history of modern Germany.

Ger 590 - History of the German Language (4)
A general historical survey showing the development of German grammar, word formation, vocabulary, and syntax with reference to the history of other Germanic languages. Conducted in English. Recommended prerequisite: Ger 302.

Ger 594 - German Linguistics (4)
Introduction to the basic concepts in linguistics and their application to German. Review of sound system; focus on morphology and syntax. Conducted in English. Also offered for undergraduate-level credit as Ger 494 and may be taken only once for credit. Recommended prerequisite: Ger 302.
Ger 597 - Applied German Linguistics (4)
A practical application of linguistic method to modern German. Emphasis on contrastive analysis of German and English. Also offered for undergraduate-level credit as Ger 497 and may be taken only once for credit. Recommended prerequisites: Ger 302 and 4 credits in linguistics.

G - Geology

G 199 - Special Studies (1-3)
See department for course description. (Credit to be arranged.)

G 200 - Field Studies (1)
Participation in field trip exercises to enhance the understanding of materials and processes taught in corresponding lower division geology courses. Field studies areas include: coast, mountains, Portland area, Eastern Oregon, etc. Lecture, field trip, and completion of workbook or research paper required. Maximum of one credit in each field studies area.
Prerequisite: Previous or concurrent enrollment in the corresponding lower-division geology course.

G 201 - Dynamic Earth: Interior (3)
Explores the Earth's structure and composition, why continents and oceans form, and how plate tectonics and oceans form, and how plate tectonics provide a unifying model to explain geological observations. Topics include the concept of deep time, the relationship between geology and topography, plate tectonics, volcanism, earthquakes, magnetism, rocks and minerals, mountain building, basin formation. This is the first course in a sequence of two: G 201 and G 202.
Corequisite: G 204.

G 202 - Dynamic Earth: Surface (3)
Explores how weather and climate alter the Earth's surface and landscapes over time due to rock weathering, mountain building, the action of streams, glaciers, wind, and ocean waves and currents. Embedded in these topics is the discussion of human practices impacting the natural environment. This is the second course in a sequence of two: G 201 and G 202.

G 203 - Historical Geology (3)
Earth's history as revealed through the rock and fossil record. Emphasis on the physical and biological changes exhibited through time. Recommended prerequisites: G 201, G 202. Requires concurrent enrollment in G 206.
Corequisite: G 206.

G 204 - Geology Laboratory (1)
Laboratory work to accompany G 201 and 202, respectively, involving basic geologic principles and processes emphasizing rocks, minerals, topographic and geologic maps. One 2-hour laboratory period. Concurrent enrollment in G 201, 202, respectively, is required.
Corequisite: G 201.

G 205 - Geology Laboratory (1)
Laboratory work to accompany G 201 and 202, respectively, involving basic geologic principles and processes emphasizing rocks, minerals, topographic and geologic maps. One 2-hour laboratory period. Concurrent enrollment in G 201, 202, respectively, is required.
Corequisite: G 202.

G 206 - Historical Geology Lab (1)
Earth's history as revealed through the rock and fossil record. Emphasis on the physical and biological changes exhibited through time. Lab exercises stress the studies of fossils. Concurrent enrollment in G 203 required.
Corequisite: G 203.

G 207 - Computer Based Geology Laboratory (2)
Laboratory work to accompany G202 involving the application of Microsoft Excel, Microsoft Access, and ArcView GIS to solve geoscience problems. One 3-hour laboratory period. Concurrent enrollment in G 202 is required.
Corequisite: G 202.

G 301 - Geology for Engineers (3)
A study of the origin, interior, and crustal materials of the Earth: the natural processes which have built it up, deformed, and torn down the crust throughout geologic time: the environmental interrelationships between man and geologic processes and resources stressing application to engineering. For majors in civil engineering.

G 312 - Mineralogy (3)
Description, classification, and genesis of minerals and their importance for understanding the make up of the Earth and planets, mineral resources, and industrial applications.
Prerequisite: one year of general chemistry.
Co-requisite: G313. Corequisite: G 313.

G 312L - Mineralogy Lab (0)
Lab for G 312.

G 313 - Methods in Mineralogy (2)
Analytical and imaging methods to evaluate a range of physical and chemical properties of minerals such as morphological features, quantitative evaluations of chemical constituents, and determination of crystal structures used for mineral identification.
Prerequisite: one year of general chemistry.
Corequisite: G 312. Corequisite: G 312.

G 314 - Petrology (3)
Origin, classification, and distribution of igneous, metamorphic, and sedimentary rocks. Composition of the Earth’s crust and mantle. Emphasis on rock type assemblages and their genesis occurring at major plate tectonic environments as represented by active/passive continental margins, rift zones, ocean basins and trenches, ocean islands, continent-continent collision belts, and stable cratons.
Prerequisite: G312. Co-requisite: G315.
Corequisite: G 315.

G 314L - Lab for G 314 (0)
Lab for G 314.

G 315 - Lithology and Petrography (2)
Description of the physical characteristics of naturally occurring rocks in hand specimen and thin section under the petrographic microscope. Understanding textures and fabrics of rocks and what physical and chemical parameters control them such as crystallization and nucleation rate, compositional environment, stress field, and provenance characteristics.
Prerequisite: G 312, G 313. Corequisite: G 314. Corequisite: G 314.
G 318 - Processes in the Surface Environment (3)
Physical processes occurring in the upper crust including tectonic provenances, weathering, mass transport, fluid-sediment transport, depositional environments, stratigraphic sequences, and intrastratal diagenesis.
G 318L - Lab for G 318 (0)
Lab for G 318.
Corequisite: G 318.
G 319 - Processes in the Surface Environment: Methods (2)
Introduction to methods of investigation of physical processes occurring in Earth’s upper crust. Topics include design and use of environmental sensors, landscape analysis using digital data sets, and scale model experiments.
G 322 - Global Biogeochemical Cycles (5)
A survey course in biogeochemistry from an earth history perspective. Study of the origin and evolution of Earth and its biogeochemical cycles; survey of the microbial and chemical reactions that occur within the atmosphere, lithosphere, hydrosphere and the biosphere; study of the mechanistic understanding of biogeochemical interactions to a large-scale, synthetic view of global biogeochemical cycles. Three 65-minute lectures and one 2-hour laboratory.
Prerequisite: one year of chemistry. Corequisite: G 322L.
G 322L - Lab for G 322 (0)
Lab for G 322.
Corequisite: G 322.
G 324 - Computer Applications and Information Technology (5)
Application of digital computers to problems in geology through familiarization with software and hardware for collecting, processing, analyzing, and presenting data. Topics covered include use of databases, spreadsheets, programming, analysis of data collected along a traverse, over a map area, and multivariate data. Applications to stratigraphic sections, chart recordings, sample locations, mapping, trend surfaces, and clustering. Three lectures and two 2-hour laboratories.
Prerequisite: Mth 261. Corequisite: G 324L.
G 324L - Lab for G 324 (0)
Lab for G 324.
Corequisite: G 324.
G 326 - Numerical Modeling of Earth Systems (5)
Application of modeling software to chemical, biological and physical global systems. Introduction to numerical methods, such as finite-elements and finite-differences, for solving systems of equations that describe geological processes. Three lectures and two 2-hour laboratories.
Prerequisite: Mth 254 or concurrent enrollment. Corequisite: G 326L.
G 326L - Lab for G 326 (0)
Lab for G 326.
Corequisite: G 326.
G 331L - Paleontology Lab (0)
(Credit to be arranged.)
Corequisite: G 331.
G 333 - Evolutionary Concepts (4)
Designed to provide background in evolutionary concepts and to address current issues in evolution as they are perceived and are being investigated by scientists in biology and geology. This is a combined lecture and discussion class and will include occasional guest lecturers presenting their research and views on various topics in evolution.
G 340 - Life of the Past (4)
Origin and development of plants, animals and man on earth, as interpreted from the study of fossils and the sedimentary rocks in which they occur. Includes integrated laboratory and field experience.
Prerequisite: upper-division standing. Two lectures, one 2-hour laboratory (academic year) or field studies (summer).
G 341 - Geology of the Oregon Country (4)
Origin and geologic history of landscape features in Oregon and the Pacific Northwest. Two lectures, one 2-hour laboratory (academic year) or field studies (summer).
Prerequisite: upper-division standing.
G 341U - Geology of the Oregon Country (4)
Origin and geologic history of landscape features in Oregon and the Pacific Northwest. Two lectures, one 2-hour laboratory (academic year) or field studies (summer).
Prerequisite: upper-division standing.
G 342 - Volcanoes and Earthquakes (4)
A study of volcanoes and earthquakes as they affect humans and the development of landscapes. A field trip is required.
Prerequisite: an introductory science course.
G 342U - Volcanoes and Earthquakes (4)
A study of volcanoes and earthquakes as they affect humans and the development of landscapes. A field trip is required.
Prerequisite: an introductory science course.
G 344 - Geology and the National Parks (4)
Covers the geology that one finds in our national park system. Parks will be grouped by similar geology. Basic concepts of geology will first be covered in each group and then each park of the group discussed.
Prerequisite: upper division standing.
G 344U - Geology and the National Parks (4)
Covers the geology that one finds in our national park system. Parks will be grouped by similar geology. Basic concepts of geology will first be covered in each group and then each park of the group discussed.
Prerequisite: upper division standing.
G 345 - Life in the Universe (4)
Focus on issues surrounding the origin and evolution of life on Earth, the environmental
conditions required for life elsewhere, and the potential for life on other planets and satellites in our solar system. Additional topics include the discovery, occurrence and habitability of extrasolar planets, and the philosophical and societal implications of searching for life beyond Earth.

Prerequisite: upper division standing. Two lectures, one 2-hour laboratory.

G 345L - Lab for G 345U (0)
Lab for G 345.
Corequisite: G 345U.

G 345U - Life in the Universe (4)
Focus on issues surrounding the origin and evolution of life on Earth, the environmental conditions required for life everywhere, and the potential for life on other planets and satellites in our solar system. Additional topics include the discovery, occurrence and habitability of extrasolar planets, and the philosophical and societal implications of searching for life beyond Earth.

Prerequisite: upper division standing. Two lectures, one 2-hour laboratory. Corequisite: G 345L.

G 346 - Exploring Mars (4)
On-line course centered on the ongoing exploration of Mars. Topics follow an exploration timeline and include Mars’ geology, climate, potential for life, and habitability. Recommended prerequisites: G 201.

G 351 - Introduction to Oceanography (4)
A survey course designed to give students a broad general background. Emphasis is on interrelationships of oceanography and other sciences. Useful for general studies, teachers and environmental science majors.

Prerequisite: upper-division standing.

G 351U - Introduction to Oceanography (4)
A survey course designed to give students a broad general background. Emphasis is on interrelationships of oceanography and other sciences. Useful for general studies, teachers and environmental science majors.

Prerequisite: upper-division standing.

G 352 - Minerals in World Affairs (4)
The geologic origin and occurrence of metals, fuels, and industrial minerals and rocks; their geographic distribution and relative abundance or lack among nations; the rules and principles which influence their past, present, and future exploration, development, and use.

Prerequisite: Upper division standing.

G 352U - Minerals in World Affairs (4)
The geologic origin and occurrence of metals, fuels, and industrial minerals and rocks; their geographic distribution and relative abundance or lack among nations; the rules and principles which influence their past, present, and future exploration, development, and use.

Prerequisite: Upper division standing.

G 353 - Natural History of Dinosaurs (4)
Dinosaurs, their evolution, classification, ecology and extinction in the context of changing environments. Study of the geologic record and tools used by geologists to determine geologic ages and sequences. Mechanisms of global change ranging from plate tectonics to asteroid impacts.

G 355 - Geosciences for Elementary Educators (4)
An integrated survey of concepts from geology, astronomy, and climatology for students interested in elementary education. Course is designed around suggested content in the Oregon Content Standards.

Prerequisite: Upper division standing.

G 374 - Geomorphic Processes (4)
A study of landform processes at the earth’s surface including the work of water, wind, and ice in erosion, transportation, and deposition on land and sea. The significance of geomorphic processes to human activities is included. A one to two-day weekend field trip is required. Three lectures and one 3-hour laboratory. No credit allowed if taken after G 318. May not be used as an elective for the B.S. in geology. This course is the same as Geog 320; course may be taken only once for credit.

Prerequisite: G 202 or equivalent. Corequisite: G 374L. Crosslisted as: Geog 320.

G 374L - Lab for G 374 (0)
Lab for G 374.
Corequisite: G 374.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>G 420 - Applied Geophysics (4)</td>
<td>Principles of geophysical measurement and interpretation; seismology, gravimetry, isostasy, geomagnetism, terrestrial electricity. Includes a survey of geophysical exploration techniques. Three lectures, one 2-hour lab. Also offered for graduate-level credit as G 520 and may be taken only once for credit.</td>
<td>Upper division.</td>
<td>Pre requisite: one year of general physics, one year of calculus. Corequisite: G 420L. Lab for G 420. Corequisite: G 420.</td>
</tr>
<tr>
<td>G 423 - Statistics and Data Analysis in the Geosciences (4)</td>
<td>Application of digital computers to problems in geology. Topics covered are analysis of data collected along a traverse, over a map area, and multivariate data. Applications to stratigraphic sections, chart recordings, sample locations, mapping, trend surfaces, and clustering. Two lectures and two 2-hour laboratory. Also offered for graduate-level credit as G 523 and may be taken only once for credit.</td>
<td>Upper division.</td>
<td>Pre requisite: one year of general calculus.</td>
</tr>
<tr>
<td>G 423L - Lab for G 423 (0)</td>
<td>Lab for G 423.</td>
<td>Upper division.</td>
<td></td>
</tr>
<tr>
<td>G 424 - Geographical Information Systems for the Natural Sciences (4)</td>
<td>Spatial data are input, analyzed, and displayed. Techniques covered include: data management, projections and reference datum, digitizing, raster and vector operations, spatial statistics. Class projects apply data management and analysis techniques to the natural sciences. Weekly professional quality lab reports are required. GIS tutorial followed by a gateway exam is used to demonstrate mastery of introductory material. Also offered for graduate-level credit as G 524 and may be taken only once for credit.</td>
<td>Upper division.</td>
<td>Pre requisite: Upper division standing in a physical or life science or mathematics program. Corequisite: G 424L.</td>
</tr>
<tr>
<td>G 425 - Field GIS (4)</td>
<td>Acquisition, storage, and display of field-based data for the natural sciences. Geospatial data generated using field-based technologies (i.e. GPS) are converted into appropriate database structures (i.e. GIS) for analysis and reporting. Project design and implementation are developed in cooperation with the instructor. Integrated laboratory/field experience. Also offered for graduate-level credit as G 525 and may be taken only once for credit. Recommended prerequisites: Stat 243 or G 324, 8 to 15 credits of lab based 200-level introductory courses in geology, biology, physics, chemistry, or environmental sciences. Upper division standing.</td>
<td>Upper division.</td>
<td>Pre requisite: one year of general physics, one year of calculus. Corequisite: G 424.</td>
</tr>
<tr>
<td>G 430 - Life of the Past (4)</td>
<td>Origin and development of plants, animals and man on earth, as interpreted from the study of fossils and the sedimentary rocks in which they occur. Includes integrated laboratory and field experience.</td>
<td>Upper division.</td>
<td>Pre requisite: upper division standing. Two lectures, one 2-hour laboratory (academic year) or field studies (summer).</td>
</tr>
<tr>
<td>G 434 - Structural Geology and Tectonics (5)</td>
<td>Study of origin, interpretation, and mapping of major and minor geologic structures and their relation to plate tectonics. Three lectures; two 2-hour laboratories; and required field study.</td>
<td>Upper division.</td>
<td>Pre requisite: G 326, Ph 203 or 213, Mth 261. Corequisite: G 434L.</td>
</tr>
<tr>
<td>G 434L - Structural Geology Lab (0)</td>
<td>Lab for G 434. Corequisite: G 434.</td>
<td>Upper division.</td>
<td></td>
</tr>
<tr>
<td>G 435 - Sedimentology and Stratigraphy (5)</td>
<td>Description, interpretation, and correlation (stratigraphy) of sedimentary rocks used to reconstruct paleo environments, infer sea-level changes, and understand a basin's tectonic evolution. Two lectures, two 2-hour laboratories and required field study.</td>
<td>Upper division.</td>
<td>Pre requisite: G 318 and G 314. Corequisite: G 435L.</td>
</tr>
<tr>
<td>G 437 - Analytical Methods (4)</td>
<td>Fundamentals, applications, and use of analytical methods in the analysis of earth materials. Analytical methods will include optical and X-ray methods and introduction to microthermometric analysis, differential thermal analysis, and granulometry. Two lectures; two 2-hour laboratory periods.</td>
<td>Upper division.</td>
<td>Pre requisite: G 312, one year of general physics, radiation safety certification (acceptable as a corequisite). Corequisite: G 437L.</td>
</tr>
<tr>
<td>G 438 - Scanning Electron Microscopy for the Biogeosciences (4)</td>
<td>Course provides student with a theoretical understanding of various scanning analytical electron microscopy techniques and hands-on experience using such techniques to characterize geological and biological materials. Topics covered include the basic physics of image and spectrum formation, sample preparation, instrument operation, and data analysis. Two hours lecture and two hours of by-arrangement laboratory. Also offered for graduate-level credit as G 538 and may be taken only once for credit.</td>
<td>Upper division.</td>
<td>Pre requisite: introductory course sequence in geology, biology, chemistry, physics, or environmental science.</td>
</tr>
<tr>
<td>G 439 - Powder X-ray Diffraction (2)</td>
<td>Identifies and quantifies minerals using powder X-ray diffraction (XRD), includes the nature and production of X-rays, basic X-ray crystallography, the principles and applications of X-ray diffraction, as well as certification for use of the X-ray diffractometer. Also includes an independent project to identify or quantify unknown minerals using the XRD. Also offered for graduate-level credit as G 539 and may be taken only once for credit.</td>
<td>Upper division.</td>
<td>Pre requisite: G 312 or one year of general chemistry.</td>
</tr>
<tr>
<td>G 440 - Volcanology (4)</td>
<td>Classification of volcanic rocks and volcanic stratigraphic units; eruptive mechanisms; modes of volcanic deposition; recognition, mapping, and correlation of volcanic units;</td>
<td>Upper division.</td>
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</tr>
</tbody>
</table>
Investigation into the origin and evolution of processes. Two lectures; two 2-hour global element cycles driven by igneous differentiation of the Earth through time, magmas and igneous rock suites using G 443 - Ground Water Geology (4)

Corequisite: G 442.

G 440L - Volcanology Lab (0)
Lab for G 440.
Corequisite: G 440.

G 442 - Igneous Petrogenesis (4)
Investigation into the origin and evolution of magmas and igneous rock suites using geochemical and petrographic methods, differentiation of the Earth through time, global element cycles driven by igneous processes. Two lectures; two 2-hour laboratory periods. Also offered for graduate-level credit as G 542 and may be taken only once for credit.

Prerequisite: G 314. Corequisite: G 440L.

G 442L - Igneous Petrogenesis Lab (0)
Lab for G 442.
Corequisite: G 442.

G 443 - Ground Water Geology (4)
Study of the physical and chemical properties of underground water; the physical properties of aquifers and their control and effect on the contained waters; water movement and the conservation and utilization of existing ground water bodies as well as development of new water bodies and rejuvenation of depleted and starved aquifers. Also offered for graduate-level credit as G 543 and may be taken only once for credit.

Prerequisite: one year of calculus, general physics, general chemistry.

G 444 - Well Dynamics (4)
Study of the interactions of water wells and an aquifer system, including all types of aquifer systems and pump tests to analyze those systems, well drilling and design, pump selection, and groundwater explorations.

Prerequisite: G 443.

G 445 - Geochemistry (4)
A survey of geochemistry. Emphasis on distribution of elements in the Earth, nuclear geochemistry and thermodynamics of geologic systems. Also offered for graduate-level credit as G 545 and may be taken only once for credit.

Prerequisite: G 314.

G 446 - Meteorites (4)
A course examining meteorites and the information they provide about the birth and evolution of the solar system. Topics include asteroids and asteroidal heat sources, the solar nebula, early solar system chronology, pre-solar grains, abiotic synthesis of organic matter, differentiation, impacts and collisional processes, and meteorites from Mars. Three lectures. Also offered for graduate-level credit as G 546 and may be taken only once for credit.

Prerequisite: G 201, one year of chemistry.

G 447 - Environmental Sediment Transport (4)
Study of sediment transport, bedforms, and depositional environment, with focus on quantitative methods of predicting rates of sediment yield, transport, and deposition in terrestrial and marine environments. Also offered for graduate-level credit as G 547 and may be taken only once for credit.

Prerequisite: G 201, one year of chemistry.

G 448 - Chemical Hydrogeology (4)
The study of low temperature aqueous groundwater geochemistry with emphasis on factors which change chemical composition of groundwater and factors which influence the transport of both inorganic and organic contaminants. Topics will include geochemistry of equilibrium reactions, mineral solubility, complexing, oxidation-reduction reactions, surface reactions and vadose zone processes. Also offered for graduate-level credit as G 548 and may be taken only once for credit.

Prerequisite: G 201, one year of chemistry. Two lectures, one 2-hour laboratory. Corequisite: G 448L.

G 448L - Lab for G 448 (0)
Lab for G 448.
Corequisite: G 448.

G 450 - Middle School Earth/Space Sciences (4)
Examines the Earth and Space science content area and classroom and developmentally appropriate field experiences for middle school students. Emphasis on developing hands-on and technology-based activities centered on the Earth and Space sciences. Materials are developed within the context of standards-based education models. Also offered for graduate-level credit as G 550 and may be taken only once for credit.

Prerequisite: 24 credits of mathematics and/or science courses.

G 453 - Geology of the Pacific Northwest (4)
Survey of the topographic and geologic features of the Pacific Northwest, emphasizing geologic and mining history and focusing on the close relationship between the Pacific Northwest as the leading edge of a moving continental plate, the geologic/paleobiologic (fossil) record of this area, and the implications of recent tectonic activity; the Mt. St. Helens eruption, earthquakes, floods, and threats of major seismic sea waves or tsunami.

Prerequisite: upper division standing. (Notes: Course available only through Independent Study.).

G 454 - Cascade Volcanoes (1)
Field course in the study of one or more Cascade volcanoes-origin and development of volcano, eruptive mechanism, deposits, rock types, and hazards. Course may be repeated for different volcano studies. Offered summers. Also offered for graduate-level credit as G 554 and may be taken only once for credit.

Prerequisite: upper division standing and one prior course from the following: G 201, 202. May be used to meet requirements for the B.A. in geology. May not be used to meet requirements for the B.S. in geology.

G 455 - Environmental Coastal Geomorphology (4)
Introduction to coastal processes, geomorphology, habitat, and development issues: emphasis on coastal shelf, beach, estuarine and dune systems. Includes the influence of sea-level, tides, waves, wind, and development pressures on these coastal systems. Also offered for graduate-level
credit as G 555 and may be taken only once for credit.

Prerequisite: G 351 or G 318.

G 456 - Astrogeology (4)

Geology and astronomy are combined to explore the evolution of the Universe and the Solar System. Comparative geologic evolution of the planets is emphasized. A significant component of the course is hands-on geologic field investigations and astronomical observations (summer) or 2-hour laboratory (academic year). Also offered for graduate-level credit as G 556 and may be taken only once for credit.

Prerequisite: upper division standing. Corequisite: G 456L.

G 456L - Lab for G 456 (0)


G 458 - Astrobiology (4)

Astrobiology focuses on issues surrounding the origin and evolution of life on Earth, the environmental conditions required for life elsewhere, and the potential for life on other planets and satellites in our solar system. Additional topics include the discovery, occurrence, and habitability of extrasolar planets, and the philosophical and societal implications of searching for life beyond earth. Also offered for graduate-level credit as G 558 and may be taken only once for credit.

Prerequisite: G 322 or upper division standing in life, environmental, or physical science.

G 459 - Quaternary Climate (4)

Study of the causes and consequences of climate change through the Quaternary. Topics include: an overview of climate system dynamics; the geologic record of Quaternary climate and its profound glacial to interglacial cycles; the use of that record to develop conceptual models of paleoclimate interactions among land, ocean, atmosphere, and biosphere; and geologic changes during the Cenozoic (the last 65 million years) that set the stage for the Quaternary. Includes computer laboratory exercises using paleoclimate data. Also offered for graduate-level credit as G 559 and may be taken only once for credit.

Prerequisite: upper division standing in a physical or life science program. Corequisite: G 459L.

G 459L - Quaternary Climate Lab (0)


G 460 - Soil Geomorphology (4)

Effects of climate, vegetation, parent material, topography, and time on the development, weathering, classification, and chemistry of soils. Two 75-minute lectures and one 2-hour laboratory. Also offered for graduate-level credit as G 560 and may be taken only once for credit.

Prerequisite: G 201, 202, Ch 200-level (1 year).

G 460L - Soil Geomorphology Lab (0)

Lab for G 460.

G 461 - Environmental Geology (4)

Study of natural hazards and related land use planning (flooding, landslides, earthquakes, volcanic, coastal) waste disposal and pollution in the geological environment, water supply, mineral and energy resources, environmental law related to geology, medical geology, climatic change. Two 75-minute lectures and one 2-hour laboratory. Also offered for graduate-level credit as G 561 and may be taken only once for credit.

Prerequisite: general chemistry (1 year), G 201, 202. Corequisite: G 461L.

G 461L - Environmental Geology Lab (0)

Lab for G 461. Corequisite: G 461.

G 464 - The Cryosphere (4)

Investigation of the global cryosphere—the regions on Earth’s surface where water is found in its solid form—in order to develop a systems understanding of ice in the Earth system. Emphasis is placed on modern systems and climate change. Lecture and lab. Lab work uses modern observational data and state-of-the-art climate simulation tools.

Prerequisite: upper-division or graduate standing.

G 464L - The Cryosphere Lab (0)

Lab for the Cryosphere.

G 465 - Glacial Geomorphology (4)

The investigation of the importance of glaciers to landscape modification and global environmental change via an understanding of their formation, structure, mass and energy exchange, and movement. Erosion and deposition processes will also be examined. This class adopts the process perspective whereby understanding the physical processes provides significant insight into the relative importance of the controlling mechanisms of change. Field trip is required. Also offered for graduate-level credit as G 565 and may be taken only once for credit.

Prerequisite: introductory geology, physical geography, or geomorphology course.

G 466 - Glaciology (4)

The physics of glacier ice and its mathematical description, and the processes that cause glaciers and ice sheets to change over time. Intended for students with interests in glaciers, geophysical fluid flows, or who wish to build their quantitative and computational skills. Includes computational laboratory exercises. Also offered for graduate-level credit as G 566 and may be taken only once for credit.

Prerequisite: one year of calculus and one year of physics. Corequisite: G 466L.

G 466L - Lab for G 466 (0)

Lab for G 466. Corequisite: G 466.

G 470 - Engineering Geology (4)

Applications of geological information to engineering problems: soil mechanics, rock mechanics, construction materials, groundwater and construction, instrumentation, exploration, terrain models, landslide analysis. Three hours of lecture and two hours of lab per week. Labs stress quantitative analysis. One day field trip explores landslides of the Portland area. Also offered for graduate-level credit as G 570 and may be taken only once for credit.

Prerequisite: G 202, Ph 203. Corequisite: G 470L.
G 470L - Lab for G 470 (0)
Lab for G 470.
Corequisite: G 470.

G 474L - Geomorphic Processes Lab (0)
Lab for G 474.
Corequisite: G 474.

G 475 - Introduction to Seismology and Site Evaluation (4)
Earthquakes and exploration seismology, the origin and occurrence of earthquakes, nature and propagation of seismic waves in the earth, earthquakes as a hazard to life and property. Uses of reflection and refraction exploration seismology, borehole velocity measurements, seismic remote sensing, and direct measurement techniques. Earthquake hazard assessment including liquefaction, ground failure, and site amplification. Techniques for evaluating the susceptibility, potential, and severity of the hazards and other science and engineering applications. Also offered for graduate-level credit as G 575; this course is the same as CE 443 and may be taken only once for credit.
Prerequisite: senior/graduate standing. Crosslisted as: CE 443.

G 477 - Earthquake Accommodation and Design (4)
Effects of earthquake shaking in the design of buildings, pipelines, bridges, and dams. Incorporating the earthquake hazard assessment for a project in the design process. The goal of this course is to allow geologists, geotechnical engineers, structural engineers, and architects to see how their particular tasks are impacted by the earthquake effects. Types of analysis used to evaluate earthquake design requirements in the several disciplines including geology, geotechnical engineering, structural engineering, and architecture. Also offered for graduate-level credit as G 577; this course is the same as CE 448/548; course may be taken only once for credit.
Prerequisite: G 475/575 or CE 443/543. Crosslisted as: CE 448.

G 481 - Field Geology (4)
Geologic mapping in sedimentary and volcanic rocks or metamorphic and plutonic rocks during a summer field camp. A charge will be made for the expenses of the field camp. Approximately 64 hours of field work in the summer. Also offered for graduate-level credit as G 581 and may be taken only once for credit.
Prerequisite: G 485.

G 484 - Field Geophysics (4)
Applications of geophysical techniques to solving a field problem. Methods applied may include gravity, resistivity, refraction ground penetrating radar, and magnetic. Includes at least one weekend in the field and production of a final report with data and conclusions. Also offered for graduate-level credit as G 584 and may be taken only once for credit.
Prerequisite: Ph 203 or Ph 213, Mth 261.

G 485 - Field Methods in Geosciences (4)
Principles of geologic mapping, and data collection using optical surveying instruments, Global Positioning System, and aerial photographs, preparation of reports and maps. Two lectures and one 4-hour laboratory. One-week field exercise at end of term.
Prerequisite: G 434 and G 435. Corequisite: G 485L.

G 485L - Lab for G 485 (0)
Lab for G 485.
Corequisite: G 485.

G 491 - Physical Processes in Geology (4)
Application of mechanics to physical processes in geology, such as igneous intrusion, rock folding, debris flow, lava flow, groundwater, and glaciation. Also offered for graduate-level credit as G 591 and may be taken only once for credit.
Prerequisite: Mth 254, Ph 203.

G 492 - Topics in Geodynamics (4)
Special topics concerning the dynamics that govern earth processes such as fluid flows and plate motions, and related physical properties of Earth materials. Representative topics include ice sheet dynamics, glacier dynamics, and thermodynamic modes of earth systems. May be repeated for credit if topics are different. Two lectures and one 2-hour laboratory.
Prerequisite: Mth 254, Ph 213, and G 326.

G 499 - Special Studies (0-8)
(Credit to be arranged.)

G 501 - Research (1-9)
(Credit to be arranged.)
Prerequisite: G 405.

G 502 - Independent Study (1-6)
See department for course description. (Credit to be arranged.) Pass/no pass only.

G 503 - Thesis (1-12)
See department for course description. (Credit to be arranged.) Pass/no pass only.

G 504 - Cooperative Education/Internship (1-9)
See department for course description. (Credit to be arranged.)

G 505 - Reading and Conference (1-6)
See department for course description. (Credit to be arranged.)

G 506 - Special Problems (1-6)
See department for course description. (Credit to be arranged.)

G 507 - Seminar (1-6)
See department for course description. (Credit to be arranged.)

G 510L - Geophysics Lab (0-6)
(Credit to be arranged.) Consent of instructor.

G 518 - Clay Mineralogy (4)
Lab for Geophysics.

G 519 - Geotechnical Engineering (4)
Contact the department for a description of this class.

G 520 - Applied Geophysics (4)
Principles of geophysical measurement and interpretation; seismology, gravimetry, isostasy, geomagnetism, terrestrial electricity. Includes a survey of geophysical exploration techniques. Three lectures, one 2-hour lab. Also offered for undergraduate-level credit as G 420 and may be taken only once for credit.
Prerequisite: one year of general physics, one year of calculus. Corequisite: G 520L.
G 520L - Applied Geophysics Lab (0)
Lab for G 520.
Corequisite: G 520.

G 523 - Statistics and Data Analysis in the Geosciences (4)
Application of digital computers to problems in geology. Topics covered are analysis of data collected along a traverse, over a map area, and multivariate data. Applications to stratigraphic sections, chart recordings, sample locations, mapping, trend surfaces, and clustering. Two lectures and two 2-hour laboratory. Also offered for undergraduate-level credit as G 423 and may be taken only once for credit.
Prerequisite: one year of calculus.

G 523L - Lab for G 523 (0)
Lab for G 523.

G 524 - Geographical Information Systems for the Natural Sciences (4)
Spatial data are input, analyzed, and displayed. Techniques covered include: data management, projections and reference datum, digitizing, raster and vector operations, spatial statistics. Class projects apply data management and analysis techniques to the natural sciences. Weekly professional quality lab reports are required. GIS tutorial followed by a gateway exam is used to demonstrate mastery of introductory material. Also offered for undergraduate-level credit as G 424 and may be taken only once for credit.
Prerequisite: Upper division standing in a physical or life science or mathematics program. Corequisite: G 524L.

G 524L - Lab for G 524 (0)
Lab for G 524.
Corequisite: G 524.

G 525 - Field GIS (4)
Acquisition, storage, and display of field-based data for the natural sciences. Geospatial data generated using field-based technologies (i.e. GPS) are converted into appropriate database structures (i.e. GIS) for analysis and reporting. Project design and implementation are developed in cooperation with the instructor. Integrated laboratory/field experience. Also offered for undergraduate-level credit as G 425 and may be taken only once for credit. Recommended prerequisites: Stat 243 or G 324, 8 to 15 credits of lab based 200-level introductory courses in geology, biology, physics, chemistry, or environmental sciences. Upper division standing.

G 537 - Analytical Methods (4)
Fundamentals, applications, and use of analytical methods in the analysis of earth materials. Analytical methods will include optical and X-ray methods and introduction to microthermometric analysis, differential thermal analysis, and granulometry. Two lectures; two 2-hour laboratory periods.
Prerequisite: G 312, one year of general physics, radiation safety certification (acceptable as a corequisite). Corequisite: G 537L.

G 537L - Analytical Methods Lab (0)
Lab for G 537.
Corequisite: G 537.

G 538 - Scanning Electron Microscopy for the Biogeosciences (4)
Course provides student with a theoretical understanding of various scanning analytical electron microscopy techniques and hands-on experience using such techniques to characterize geological and biological materials. Topics covered include the basic physics of image and spectrum formation, sample preparation, instrument operation, and data analysis. Two hours lecture and two hours of by-arrangement laboratory. Also offered for undergraduate-level credit as G 438 and may be taken only once for credit.
Prerequisite: Introductory course sequence in geology, biology, chemistry, physics, or environmental science.

G 539 - Powder X-ray Diffraction (2)
Identifies and quantifies minerals using powder X-ray diffraction (XRD), includes the nature and production of X-rays, basic X-ray crystallography, the principles and applications of X-ray diffraction, as well as certification for use of the X-ray diffractometer. Also includes an independent project to identify or quantify unknown minerals using the XRD. Also offered for undergraduate-level credit as G 439 and may be taken only once for credit.
Prerequisite: G 312 or one year of general chemistry.

G 540 - Volcanology (4)
Classification of volcanic rocks and volcanic stratigraphic units; eruptive mechanisms; modes of volcanic deposition; recognition, mapping, and correlation of volcanic units; and stratigraphic syntheses of volcanic terranes. Two 75-minute lectures, one 2-hour laboratory. Field trip is required. Also offered for undergraduate-level credit as G 440 and may be taken only once for credit.
Prerequisite: G 314. Corequisite: G 540L.

G 540L - Volcanology Lab (0)
Lab for G 540.
Corequisite: G 540.

G 542 - Igneous Petrogenesis (4)
Investigation into the origin and evolution of magmas and igneous rock suites using geochemical and petrographic methods, differentiation of the Earth through time, global element cycles driven by igneous processes. Two lectures; two 2-hour laboratory periods. Also offered for undergraduate-level credit as G 442 and may be taken only once for credit.
Prerequisite: G 314. Corequisite: G 542L.

G 542L - Igneous Petrogenesis Lab (0)
Lab for G 542.
Corequisite: G 542.

G 543 - Ground Water Geology (4)
Study of the physical and chemical properties of underground water; the physical properties of aquifers and their control and effect on the contained waters; water movement and the conservation and utilization of existing ground water bodies as well as development of new water bodies and rejuvenation of depleted and starved aquifers. Also offered for undergraduate-level credit as G 443 and may be taken only once for credit.
Prerequisite: one year of calculus, general physics, general chemistry.

G 544 - Well Dynamics (4)
Study of the interactions of water wells and an aquifer system, including all types of aquifer systems and pump tests to analyze those systems, well drilling and design,
G 545 - Geochemistry (4)
A survey of geochemistry. Emphasis on distribution of elements in the Earth, nuclear geochemistry and thermodynamics of geologic systems. Also offered for undergraduate-level credit as G 445 and may be taken only once for credit.
Prerequisite: G 314.

G 546 - Meteorites (4)
A course examining meteorites and the information they provide about the birth and evolution of the solar system. Topics include asteroids and asteroidal heat sources, the solar nebula, early solar system chronology, pre-solar grains, abiogenic synthesis of organic matter, differentiation, impacts and collisional processes, and meteorites from Mars. Three lectures. Also offered for undergraduate-level credit as G 446 and may be taken only once for credit.
Prerequisite: G 201, one year of chemistry.

G 547 - Environmental Sediment Transport (4)
Study of sediment transport, bedforms, and depositional environment, with focus on quantitative methods of predicting rates of sediment yield, transport, and deposition in terrestrial and marine environments. Also offered for undergraduate-level credit as G 447 and may be taken only once for credit.
Prerequisite: ESR 220 or G 202 and Mth 251.

G 548 - Chemical Hydrogeology (4)
The study of low temperature aqueous groundwater geochemistry with emphasis on factors which change chemical composition of groundwater and factors which influence the transport of both inorganic and organic contaminants. Topics will include geochemistry of equilibrium reactions, mineral solubility, complexing, oxidation-reduction reactions, surface reactions and vadose zone processes. Also offered for undergraduate-level credit as G 448 and may be taken only once for credit.
Prerequisite: one year of chemistry. Two lectures, one 2-hour laboratory. Corequisite: G 548L.

G 548L - Lab for G 548 (0)
Lab for G 548.

G 550 - Middle School Earth/Space Sciences (4)
Examines the Earth and Space science content area and classroom and developmentally appropriate field experiences for middle school students. Emphasis on developing hands-on and technology-based activities centered on the Earth and Space sciences. Materials are developed within the context of standards-based education models. Also offered for undergraduate-level credit as G 450 and may be taken only once for credit.
Prerequisite: 24 credits of mathematics and/or science courses.

G 554 - Cascade Volcanoes (1)
Field course in the study of one or more Cascade volcanoes-origin and development of volcano, eruptive mechanism, deposits, rock types, and hazards. Course may be repeated for different volcano studies. Offered summers. Also offered for undergraduate-level credit as G 454 and may be taken only once for credit.
Prerequisite: upper division standing and one prior course from the following: G 201, 202. May be used to meet requirements for the B.A. in geology. May not be used to meet requirements for the B.S. in geology.

G 555 - Environmental Coastal Geomorphology (4)
Introduction to coastal processes, geomorphology, habitat, and development issues: emphasis on coastal shelf, beach, estuarine and dune systems. Includes the influence of sea-level, tides, waves, wind, and development pressures on these coastal systems. Also offered for undergraduate-level credit as G 455 and may be taken only once for credit.
Prerequisite: G 351 or G 318.

G 556 - Astrobiology (4)
Astrobiology focuses on issues surrounding the origin and evolution of life on Earth, the environmental conditions required for life elsewhere, and the potential for life on other planets and satellites in our solar system. Additional topics include the discovery, occurrence, and habitability of extrasolar planets, and the philosophical and societal implications of searching for life beyond earth. Also offered for undergraduate-level credit as G 458 and may be taken only once for credit.
Prerequisite: G 322 or upper division standing in life, environmental, or physical science.

G 559 - Quaternary Climate (4)
Study of the causes and consequences of climate change through the Quaternary. Topics include: an overview of climate system dynamics; the geologic record of Quaternary climate and its profound glacial to interglacial cycles; the use of that record to develop conceptual models of paleoclimate interactions among land, ocean, atmosphere, and biosphere; and geologic changes during the Cenozoic (the last 65 million years) that set the stage for the Quaternary. Includes computer laboratory exercises using paleoclimate data. Also offered for undergraduate-level credit as G 459 and may be taken only once for credit.
Prerequisite: upper division standing in a physical or life science program. Corequisite: G 559L.

G 559L - Quaternary Climate Lab (0)
Lab for G 559.

G 556L - Lab for G 556 (0)
Lab for G 556.

G 558 - Astrobiology (4)
Astrobiology focuses on issues surrounding the origin and evolution of life beyond Earth, the environmental conditions required for life elsewhere, and the potential for life on other planets and satellites in our solar system. Additional topics include the discovery, occurrence, and habitability of extrasolar planets, and the philosophical and societal implications of searching for life beyond Earth. Also offered for undergraduate-level credit as G 458 and may be taken only once for credit.
Prerequisite: upper division standing.

G 556L - Lab for G 556 (0)
Lab for G 556.
Corequisite: G 556.

G 558 - Astrobiology (4)
Astrobiology focuses on issues surrounding the origin and evolution of life beyond Earth, the environmental conditions required for life elsewhere, and the potential for life on other planets and satellites in our solar system. Additional topics include the discovery, occurrence, and habitability of extrasolar planets, and the philosophical and societal implications of searching for life beyond Earth. Also offered for undergraduate-level credit as G 458 and may be taken only once for credit.
Prerequisite: upper division standing.

G 556L - Lab for G 556 (0)
Lab for G 556.
Corequisite: G 556.

G 558 - Astrobiology (4)
Astrobiology focuses on issues surrounding the origin and evolution of life beyond Earth, the environmental conditions required for life elsewhere, and the potential for life on other planets and satellites in our solar system. Additional topics include the discovery, occurrence, and habitability of extrasolar planets, and the philosophical and societal implications of searching for life beyond Earth. Also offered for undergraduate-level credit as G 458 and may be taken only once for credit.
Prerequisite: upper division standing.

G 556L - Lab for G 556 (0)
Lab for G 556.
Corequisite: G 556.
G 560 - Soil Geomorphology (4)
Effects of climate, vegetation, parent material, topography, and time on the development, weathering, classification, and chemistry of soils. Two 75-minute lectures and one 2-hour laboratory. Also offered for undergraduate-level credit as G 460 and may be taken only once for credit.
Prerequisite: general chemistry (1 year).
G 560L - Soil Geomorphology Lab (0)
Lab for G 560.

G 561 - Environmental Geology (4)
Study of natural hazards and related land use planning (flooding, landslides, earthquakes, volcanic, coastal) waste disposal and pollution in the geological environment, water supply, mineral and energy resources, environmental law related to geology, medical geology, climatic change. Two 75-minute lectures and one 2-hour laboratory. Also offered for undergraduate-level credit as G 461 and may be taken only once for credit.
Prerequisite: general chemistry (1 year), G 201, 202. Corequisite: G 561L.

G 561L - Environmental Geology Lab (0)
Lab for G 561.
Corequisite: G 561.

G 564 - The Cryosphere (4)
Investigation of the global cryosphere—the regions on Earth’s surface where water is found in its solid form—in order to develop a systems understanding of ice in the Earth system. Emphasis is placed on modern systems and climate change. Lecture and lab. Lab work uses modern observational data and state-of-the-art climate simulation tools.
Prerequisite: upper-division or graduate standing.

G 564L - The Cryosphere Lab (0)
Lab for the Cryosphere.

G 565 - Glacial Geomorphology (4)
The investigation of the importance of glaciers to landscape modification and global environmental change via an understanding of their formation, structure, mass and energy exchange, and movement. Erosion and deposition processes will also be examined. This class adopts the process perspective whereby understanding the physical processes provides significant insight into the relative importance of the controlling mechanisms of change. Field trip is required. Also offered for undergraduate-level credit as G 465 and may be taken only once for credit.
Prerequisite: introductory geology, physical geography, or geomorphology course.

G 566 - Glaciology (4)
The physics of glacier ice and its mathematical description, and the processes that cause glaciers and ice sheets to change over time. Intended for students with interests in glaciers, geophysical fluid flows, or who wish to build their quantitative and computational skills. Includes computational laboratory exercises. Also offered for undergraduate-level credit as G 466 and may be taken only once for credit.
Prerequisite: one year of calculus and one year of physics. Corequisite: G 566L.

G 566L - Lab for G 566 (0)
Lab for G 566.
Corequisite: G 566.

G 570 - Engineering Geology (4)
Applications of geological information to engineering problems: soil mechanics, rock mechanics, construction materials, groundwater and construction, instrumentation, exploration, terrain models, landslide analysis. Three hours of lecture and two hours of lab per week. Labs stress quantitative analysis. One day field trip explores landslides of the Portland area. Also offered for undergraduate-level credit as G 470 and may be taken only once for credit.
Prerequisite: G 202, Ph 203. Corequisite: G 570L.

G 570L - Lab for G 570 (0)
Lab for G 570.
Corequisite: G 570.

G 574 - Geomorphic Processes Lab (0)
Lab for G 571.

G 574L - Geomorphic Processes Lab (0)
Lab for G 574.
Corequisite: G 574.

G 575 - Introduction to Seismology and Site Evaluation (4)
Earthquakes and exploration seismology, the origin and occurrence of earthquakes, nature and propagation of seismic waves in the earth, earthquakes as a hazard to life and property. Uses of reflection and refraction exploration seismology, borehole velocity measurements, seismic remote sensing, and direct measurement techniques. Earthquake hazard assessment including liquefaction, ground failure, and site amplification. Techniques for evaluating the susceptibility, potential, and severity of the hazards and other science and engineering applications. Also offered for undergraduate-level credit as G 475; this course is the same as CE 543 and may be taken only once for credit.
Prerequisite: senior/graduate standing. Crosslisted as: CE 543.

G 577 - Earthquake Accommodation and Design (4)
Effects of earthquake shaking in the design of buildings, pipelines, bridges, and dams. Incorporating the earthquake hazard assessment for a project in the design process. The goal of this course is to allow geologists, geotechnical engineers, structural engineers, and architects to see how their particular tasks are impacted by the earthquake effects. Types of analysis used to evaluate earthquake design requirements in the several disciplines including geology, geotechnical engineering, structural engineering, and architecture. Also offered for undergraduate-level credit as G 477; this course is the same as CE 448/548; course may be taken only once for credit.
Prerequisite: G 475/575 or CE 443/543.

G 581 - Field Geology (4)
Geologic mapping in sedimentary and volcanic rocks or metamorphic and plutonic
rocks during a summer field camp. A charge will be made for the expenses of the field camp. Approximately 64 hours of field work in the summer. Also offered for undergraduate-level credit as G 481 and may be taken only once for credit.

Prerequisite: G 485.

G 584 - Field Geophysics (4)
Applications of geophysical techniques to solving a field problem. Methods applied may include gravity, resistivity, refraction ground penetrating radar, and magnetics. Includes at least one weekend in the field and production of a final report with data and conclusions. Also offered for undergraduate-level credit as G 484 and may be taken only once for credit.

Prerequisite: Ph 203 or Ph 213, Mth 261.

G 591 - Physical Processes in Geology (4)
Application of mechanics to physical processes in geology, such as igneous intrusion, rock folding, debris flow, lava flow, groundwater, and glaciation. Also offered for undergraduate-level credit as G 491 and may be taken only once for credit.

Prerequisite: Mth 254, Ph 203.

G 592 - Methods in Quaternary Stratigraphy (4)
Analysis of the methods used and their applications in physical stratigraphy including seismic, sequence, geochemical, paleomagnetic, well log, and topics in Quaternary process stratigraphy. Also offered for credit as G 592 and may be taken only once for credit.

Prerequisite: G 491/591, Mth 254, Ph 203.

G 595 - Topics in Geomechanics (4)
Topics in the application of geochemistry to solve geological problems. Advanced techniques in analysis and examination. Two lectures and one 2-hour laboratory. May be repeated if topics are different.
Prerequisite: G 545.

G 671 - Advanced Engineering Geology (4)
Strength and stability of earth materials, resources, and land use, exploration and instrumentation, professional practices. Also offered for credit as G 571 and may be taken only once for credit.
Prerequisite: G 470.

G 692 - Methods in Quaternary Stratigraphy (4)
Analysis of the methods used and their applications in physical stratigraphy including seismic, sequence, geochemical, paleomagnetic, well log, and topics in Quaternary process stratigraphy. Also offered for credit as G 592 and may be taken only once for credit.
Prerequisite: G 434.

G 695 - Topics in Geomechanics (4)
Topics chosen from finite strain, rock fracture, and rock folding. May be repeated if topics are different. Also offered for credit as G 595.
Prerequisite: G 491/591, Mth 254, Ph 203.

Grk - Greek

Grk 101 - First-year Ancient Greek (4)
An introduction to ancient Greek. The course will provide a survey of ancient Greek grammar and syntax, as well as vocabulary building and elementary readings. This is the first course in a sequence of three: Grk 101, Grk 102, and Grk 103.

Grk 102 - First-year Ancient Greek (4)
An introduction to ancient Greek. The course will provide a survey of ancient Greek grammar and syntax, as well as vocabulary building and elementary readings. This is the second course in a sequence of three: Grk 101, Grk 102, and Grk 103.

Grk 103 - First-year Ancient Greek (4)
An introduction to ancient Greek. The course will provide a survey of ancient Greek grammar and syntax, as well as vocabulary building and elementary readings. This is the third course in a sequence of three: Grk 101, Grk 102, and Grk 103.
Grk 199 - Special Studies (1-8)
(Credit to be arranged.)

Grk 201 - Second-year Ancient Greek (4)
Course provides a review of grammar in the context of selected readings from archaic and classical authors. This is the first course in a sequence of three: Grk 201, Grk 202, and Grk 203. Recommended prerequisite: Grk 103.

Grk 202 - Second-year Ancient Greek (4)
Course provides a review of grammar in the context of selected readings from archaic and classical authors. This is the second course in a sequence of three: Grk 201, Grk 202, and Grk 203. Recommended prerequisite: Grk 103.

Grk 203 - Second-year Ancient Greek (4)
Course provides a review of grammar in the context of selected readings from archaic and classical authors. This is the third course in a sequence of three: Grk 201, Grk 202, and Grk 203. Recommended prerequisite: Grk 103.

Grk 330 - Ancient Greek Literature in Translation (4)
Course provides a survey of ancient Greek literature from the eighth century B.C. through the classical period. The course will cover epic, historical, dramatic, and philosophical texts. Conducted in English.

Grk 330U - Ancient Greek Literature in Translation (4)
Course provides a survey of ancient Greek literature from the eighth century B.C. through the classical period. The course will cover epic, historical, dramatic, and philosophical texts. Conducted in English.

Grk 331 - Plato as Literature (4)
Course in translation provides an introduction to the dialogues of Plato in their cultural context. Special attention will be given to the significance of Plato's use of the dialogue form, the role of characters in the dialogue, and his ethical and political philosophy. Conducted in English.

Grk 331U - Plato as Literature (4)
Course in translation provides an introduction to the dialogues of Plato in their cultural context. Special attention will be given to the significance of Plato's use of the dialogue form, the role of characters in the dialogue, and his ethical and political philosophy. Conducted in English.

Grk 332 - Greek Religion (4)
Provides a survey of Greek religious beliefs, rituals, and practices in pre-Christian antiquity through a study of the literary, inscriptive, artistic, and archaeological evidence. Conducted in English.

Grk 332U - Greek Religion (4)
Provides a survey of Greek religious beliefs, rituals, and practices in pre-Christian antiquity through a study of the literary, inscriptive, artistic, and archaeological evidence. Conducted in English.

Grk 333 - Women in Ancient Greece (4)
Course on the role of women in ancient Greece as daughters, wives, concubines, mothers, heiresses, writers, priestesses, and participants in religious rituals and festivals. Conducted in English.

Grk 333U - Women in Ancient Greece (4)
Course on the role of women in ancient Greece as daughters, wives, concubines, mothers, heiresses, writers, priestesses, and participants in religious rituals and festivals. Conducted in English.

Grk 334 - Greek Ethical Thought (4)
A survey of the development of Greek ethical thinking from the archaic period through the Hellenistic period, including the role of ethics in Greek religion, Platonic dialogues, Aristotle's Nicomachean Ethics and Epicurean and Stoic philosophy. Conducted in English.

Grk 334U - Greek Ethical Thought (4)
A survey of the development of Greek ethical thinking from the archaic period through the Hellenistic period, including the role of ethics in Greek religion, Platonic dialogues, Aristotle's Nicomachean Ethics and Epicurean and Stoic philosophy. Conducted in English.

Grk 335 - Sophocles and Euripides (4)
Course on two of the most important tragedians of ancient Greece, covering all of the extant works of Sophocles and the most important works of Euripides in their cultural context. Conducted in English.

Grk 335U - Sophocles and Euripides (4)
Course on two of the most important tragedians of ancient Greece, covering all of the extant works of Sophocles and the most important works of Euripides in their cultural context. Conducted in English.

Grk 336 - Ancient Greek Comedy (4)
A survey of ancient Greek comedy, covering all of the extant plays of Aristophanes, as well as largest surviving fragments of the plays of Menander. Taught in English.

Grk 336U - Ancient Greek Comedy (4)
A survey of ancient Greek comedy, covering all of the extant plays of Aristophanes, as well as largest surviving fragments of the plays of Menander. Taught in English.

Grk 399 - Special Studies (1-6)
(Credit to be arranged.)

GRN-Gender Race and Nations

GRN 510 - Selected Studies (1-9)
(Credit to be arranged.)

GRN 515 - Constructions of Power and Knowledge: Gender, Race, and Nations (4)
Course critically analyzes how the concepts of gender, race, culture, class, sexuality, and nation are invested with power and inequality. Examines the politics of the production of knowledge in personal lived experiences; institutions; cultural, economic and geopolitical structures; and literary, visual and multimedia representations.

GSCM - Global Supply Chain Management

GSCM 501 - Research (1-9)
(Credit to be arranged.)

GSCM 501 - Research (1-9)
(Credit to be arranged.)

GSCM 502 - Independent Study (1-9)
(Credit to be arranged.)

GSCM 504 - Cooperative Education/Internship (1-9)
(Credit to be arranged.)

GSCM 505 - Reading & Conference (1-12)
(Credit to be arranged.)

GSCM 506 - Special Projects (1-9)
(Credit to be arranged.)
GSCM 507 - Seminar (1-6)
(Credit to be arranged.)

GSCM 509 - Practicum (1-9)
(Credit to be arranged.)

GSCM 510 - Special Topics (1-8)
(Credit to be arranged.)

GSCM 511 - Principles of Strategic Global Sourcing (4)
Overview of planning strategies and tactical execution for sustainable operational sourcing in a global environment. Topics to be reviewed include: locating and qualifying international suppliers, the strategies regarding outsourcing / off-shoring, supplier operational metrics and strategies, establishing and maintaining relationships, e-procurement, new product introduction, and quality systems with selected suppliers.

GSCM 512 - Global Managerial and Cost Accounting (4)
The course covers global managerial cost accounting issues, and focuses on the use of accounting information within the multinational firm. In addition, the course will consider financial models used in analyzing the economic viability of new products and services. Students will also be exposed to activity based costing, standards and variance analysis, and inventory valuation.

GSCM 513 - Principles of Strategic Global Logistics (4)
This course deals with the development of strategies supply chain management involving the transfer of goods and services across national boundaries. Included are studies of inventory and warehouse planning and control and the principles of transportation. Managing logistics in an international environment will be the primary focus, with special attention given to air, rail, truck, and sea transportation.

GSCM 514 - Reverse Logistics and Closed Loop Supply Chain (4)
The increasing globalization of suppliers and customers has increased concern with the issues of sustainable and responsible management across global supply chains. In this course students will explore the main risks, opportunities and practices we now see in global supply chain management from both conceptual and practical perspectives on sustainable practice. Students in this course will engage in applied studies and learn from academics and practitioners about the current challenges in this critical business arena.

GSCM 515 - Global Case Studies in Supply Chain Management (4)
The final course in the Supply and Logistics Specialization integrates all of the concepts contained within the previous three classes. Global Supply and Logistics planning and strategy development is the primary focus. This is a case study based course where each week students are expected to analyze and prepare supply and logistics cases in an international setting. Emphasis is on developing analytical and problem-solving skills and generating the quantitative and qualitative information necessary to make superior managerial decisions.

GSCM 516 - Global Supply Chain Forecasting and Production Planning (4)
The objective of this course is to familiarize students with the major tools used for manufacturing planning and control. To this end, we will perform an in-depth analysis of integrated operations management systems with emphasis on operations planning and control, material requirements planning, master scheduling, forecasting, capacity planning, just-in-time and related topics. These tools will be covered with more detail than previous SCM courses and we will examine how the various components fit together to form a complete system.

GSCM 517 - Supply Chain International Field Study (4)
Economic globalization can provide enormous strategic benefits (risks) by coordinating operations located in different countries. Today’s producers must coordinate international material flow, produce in multiple countries, and deliver new products to customers at ever increasing speed and on-time. This course will provide students with an "on the ground" opportunity to explore the challenges in globalized operations strategies.

GSCM 518 - Global Supply Chain Project Management (4)
This course emphasizes how to implement a project within the time, cost, scope, and quality success criteria that influence supply chain strategies. The spectrum of project management in supply chain includes the participation in new product development, sourcing of supply, the transformation process, logistics, and planning for the return of materials after the life cycle is complete.

GSCM 519 - Global Supply Chain Negotiations (4)
The purpose of this course is to analyze the negotiation challenges faced by the global supply chain professional. Thus the content is focused on contract negotiation, Uniform Commercial Code, UN Convention on Contracts, and e-procurement. The course will encourage development of these skills experientially by emphasizing relationships and a total cost perspective.

GSCM 520 - Global Supply Chain Strategy (2)
In this course students develop the ability to conceptualize, design, and implement supply chains aligned with product, market, and customer characteristics. Students assess how internet technologies, dynamic markets, and globalization are impacting supply chain strategies and practices, including: logistics, inventory and risk management, procurement and supply contracting, product and process design, and revenue channels.

GSCM 521 - Global Information, Systems and Data Analytics (4)
The premise of this course is that supply chain management must understand and assess the information resources and technologies that underpin the life cycle of goods and services. Information is generated at each stage of the supply chain and crucial to the performance is where and how to store, analyze and act upon its insights.

GSCM 522 - Global Leadership and Ethics in Supply Chain Management (2)
This course provides students with a solid understanding of the concepts linking leadership to global and social systems, international organizational development, and the connection between leadership, systems, and global supply chains. Global leadership is studied from four perspectives: the virtual team leading across borders and organizations, ethical and cultural ramifications of leadership, and the ethical traits of global leaders and followership, and
your own value system and its place within a global supply chain organization.

**GSCM 525 - Supply Chain Capstone Consulting Experience (4)**

The course provides students the opportunity to have a significant, hands-on experience that builds upon the foundation of the core of the GSCM program. Students, operating as part of a consulting team, work closely with a client to help solve a supply chain oriented business problem. The scope of the project is 600 hours of research as a group on the behalf of the client.

**Heb - Hebrew**

**Heb 101 - First-year Modern Hebrew (4)**

Introduction to modern Hebrew; emphasis on basic grammar, syntax, noun and verb formation, listening and reading comprehension, translation, writing, and speaking. For nonnative speakers of Hebrew only. This is the first course in a sequence of three: Heb 101, Heb 102, Heb 103.

**Heb 102 - First-year Modern Hebrew (4)**

Introduction to modern Hebrew; emphasis on basic grammar, syntax, noun and verb formation, listening and reading comprehension, translation, writing, and speaking. For nonnative speakers of Hebrew only. This is the second course in a sequence of three: Heb 101, Heb 102, Heb 103.

**Heb 103 - First-year Modern Hebrew (4)**

Introduction to modern Hebrew; emphasis on basic grammar, syntax, noun and verb formation, listening and reading comprehension, translation, writing, and speaking. For nonnative speakers of Hebrew only. This is the third course in a sequence of three: Heb 101, Heb 102, Heb 103.

**Heb 199 - Special Studies (1-3)**

(Credit to be arranged.)

**Heb 201 - Second-year Modern Hebrew (4)**

Continued study of grammar and syntax, reading intermediate literary texts, translation, conversation, writing, and speaking. For non-native speakers of Hebrew only. This is the first course in a sequence of three: Heb 201, Heb 202, Heb 203.

**Heb 202 - Second-year Modern Hebrew (4)**

Continued study of grammar and syntax, reading intermediate literary texts, translation, conversation, writing, and speaking. Recommended prerequisite: Heb 103. For non-native speakers of Hebrew only. This is the second course in a sequence of three: Heb 201, Heb 202, Heb 203.

**Heb 203 - Second-year Modern Hebrew (4)**

Continued study of grammar and syntax, reading intermediate literary texts, translation, conversation, writing, and speaking. Recommended prerequisite: Heb 103. For non-native speakers of Hebrew only. This is the third course in a sequence of three: Heb 201, Heb 202, Heb 203.

**Heb 299 - Special Studies (1-12)**

(Credit to be arranged.)

**Heb 301 - Modern Hebrew Readings (4)**

301 emphasizes essays, short stories, and selected poems. 302 emphasizes modern media Hebrew. Translation and writing. For non-native speakers of Hebrew only. This is the first course in a sequence of two: Heb 301, Heb 302.

**Heb 302 - Modern Hebrew Readings (4)**

301 emphasizes essays, short stories, and selected poems. 302 emphasizes modern media Hebrew. Translation and writing. Recommended prerequisite: Heb 203. For non-native speakers of Hebrew only. This is the second course in a sequence of two: Heb 301, Heb 302.

**Heb 303 - Third-year Modern Hebrew (4)**


**Heb 399 - Special Studies (1-6)**

(Credit to be arranged.)

**Heb 401 - Research (1-6)**

(Credit to be arranged.)

**Heb 404 - Cooperative Education/Internship (1-12)**

(Credit to be arranged.)

**Heb 410 - Selected Topics (1-6)**

(Credit to be arranged.)

**Hon - University Honors Program**

**Hon 101 - The Global City (5)**

This year-long sequence introduces ways to think critically about the urban environment and the interdependence between the city and the global world. It begins the study of representations and perceptions of the city, the city in historical context, and the processes that shape the city’s geopolitical manifestations. This is the first course in a sequence of three: Hon 101, Hon 102, and Hon 103.

Prerequisite: admission to Honors Program.

**Hon 102 - The Global City (5)**

This year-long sequence introduces ways to think critically about the urban environment and the interdependence between the city and the global world. It begins the study of representations and perceptions of the city, the city in historical context, and the processes that shape the city’s geopolitical manifestations. This is the second course in a sequence of three: Hon 101, Hon 102, and Hon 103.

Prerequisite: admission to Honors Program.

**Hon 103 - The Global City (5)**

This year-long sequence introduces ways to think critically about the urban environment and the interdependence between the city and the global world. It begins the study of representations and perceptions of the city, the city in historical context, and the processes that shape the city’s geopolitical manifestations. This is the third course in a sequence of three: Hon 101, Hon 102, and Hon 103.

Prerequisite: admission to Honors Program.

**Hon 199 - Studies I-VI (1-6)**

Studies I-III comprise 15 credits (12 hours lecture, 3 hours recitation): Studies IV-VI comprise 12 credits (lecture only, no recitation).

**Hon 201 - Urban Social Systems: Methods in the Social Sciences (4)**

In tandem with Hon 202 and Hon 203, this course emphasizes undergraduate research, with the city of Portland serving as archive, stage, and laboratory. Students explore the
Instructor, with a seminar paper required.

Discussion of an area to be chosen by consent of instructor. Reading and conference.

Hon 410 - Selected Studies (1-6)  
(Credit to be arranged.)

Hon 407 - Seminar (1-6)  
Consent of instructor. Reading and discussion of an area to be chosen by instructor, with a seminar paper required.

Hon 410 - Selected Studies (1-6)  
(Credit to be arranged.)

Hst - History

Hst 101 - History of Western Civilizations (4)  
Survey of the origins and development of Western civilizations from antiquity to the present. Hst 101: Antiquity to Renaissance; Hst 102: Late Medieval to Enlightenment; Hst 103: Enlightenment to present. This is the first course in a sequence of three: Hst 101, Hst 102, and Hst 103.

Hst 102 - History of Western Civilizations (4)  
Survey of the origins and development of Western civilizations from antiquity to the present. Hst 101: Antiquity to Renaissance; Hst 102: Late Medieval to Enlightenment; Hst 103: Enlightenment to present. This is the second course in a sequence of three: Hst 101, Hst 102, and Hst 103.

Hst 103 - History of Western Civilizations (4)  
Survey of the origins and development of Western civilizations from antiquity to the present. Hst 101: Antiquity to Renaissance; Hst 102: Late Medieval to Enlightenment; Hst 103: Enlightenment to present. This is the third course in a sequence of three: Hst 101, Hst 102, and Hst 103.

Hst 104 - World History (4)  
A survey of world history from earliest times to the present, combining both chronological and thematic approaches. Hst 104: Origins to 1000 CE, Hst 105: 1000-1600 CE, Hst 106: 1500-present. This is the first course in a sequence of three: Hst 104, Hst 105, and Hst 106.

Hst 105 - World History (4)  
A survey of world history from earliest times to the present, combining both chronological and thematic approaches. Hst 104: Origins to 1000 CE, Hst 105: 1000-1600 CE, Hst 106: 1500-present. This is the second course in a sequence of three: Hst 104, Hst 105, and Hst 106.

Hst 106 - World History (4)  
A survey of world history from earliest times to the present, combining both chronological and thematic approaches. Hst 104: Origins to 1000 CE, Hst 105: 1000-1600 CE, Hst 106: 1500-present. This is the third course in a sequence of three: Hst 104, Hst 105, and Hst 106.

Hst 201 - History of the United States (4)  

Hst 202 - History of the United States (4)  

Hst 203 - History of the United States (4)  

Hst 297 - History through Film (4)  
Introduction to selected topics of modern history through the viewing and analysis of important documentaries and feature films. The subject matter will vary from term to term.

Hst 300 - The Historical Imagination (4)  
The how and why of the historian's craft: (1) an introduction to the basics of research and writing; (2) an examination of historical writing, its relationship to the time and place of its origin, and the emergence of the ideas, consciousness, and canons of scholarship which shaped it. This course serves as an introduction to the study of history at the upper division level and is recommended for students beginning their junior year.

Hst 312 - African History Before 1800 (4)  
An upper division course designed to survey the history of the African continent from earliest times to the period of the Atlantic slave trade. Using a lecture/discussion format, the course will examine the impact of trade, technology, and ecology on the transformation of African societies before 1800. This is the same course as BSt 305 and may be taken only once for credit. Crosslisted as: BSt 305.

Hst 312U - African History Before 1800 (4)  
An upper division course designed to survey the history of the African continent from earliest times to the period of the Atlantic slave trade. Using a lecture/discussion format, the course will examine the impact of trade, technology, and ecology on the transformation of African societies before 1800. This is the same course as BSt 305 and may be taken only once for credit.
Hst 101 - Upper Division Standing.

Crosslisted as: BST 305U.

Hst 313U - Ancient Near East and Egypt (4)
An upper division course designed to survey the history of the African continent from 1800 to the present, with emphasis on the era of the Atlantic slave trade, colonial period, independence, and post independence. This is the same course as BST 306 and may be taken only once for credit.

Crosslisted as: BST 306.

Hst 316U - Roman History (4)
A study of the social, political, economic, and cultural history of the Mediterranean region between 753 BCE and the fall of Rome.

Hst 316U - Roman History (4)
A study of the social, political, economic, and cultural history of the Mediterranean region between 753 BCE and the fall of Rome.

Recommended prerequisite: Hst 101 or Sophomore Inquiry (Greek Civilization).

Hst 317U - Jewish History from Antiquity to the Medieval Period (4)
Introduces students to the Jewish historical experience from its Biblical origins through the end of the first millennium CE primarily by means of close readings of primary sources. Describes the diverse forms of Jewish life under Persian, Greco-Roman, Early Christian and Muslim rule and examines the boundaries of pre-modern Jewish cultural and religious identity. This is the same course as JSt 317 and may be taken only once for credit.

Crosslisted as: JSt 317.

Hst 317U - Jewish History from Antiquity to the Medieval Period (4)
Introduces students to the Jewish historical experience from its Biblical origins through the end of the first millennium CE primarily by means of close readings of primary sources. Describes the diverse forms of Jewish life under Persian, Greco-Roman, Early Christian and Muslim rule and examines the boundaries of pre-modern Jewish cultural and religious identity. This is the same course as JSt 317 and may be taken only once for credit.

Crosslisted as: JSt 317.

Hst 318U - Jewish History from the Medieval Period to the Present (4)
Survey of Jewish history from the year 1000 to the present, covering major developments in Jewish society and culture in the medieval Islamic and Christian realms, early modern Europe and the Middle East, and the modern world. Topics include religious thought, communal and political structures, and Jewish/non-Jewish relations. This is the same course as JSt 318 and may be taken only once for credit.

Crosslisted as: JSt 318.

Hst 319U - Rabbinic Culture in the Roman World (4)
Introduction to history and literature of the rabbinic movement in Roman Palestine, 70 CE-500 CE. Origins of the rabbis, their role in society, genres of rabbinic literature (Mishnah, Talmud, Midrash), rabbinic law and theology and rabbinic attitudes towards the urban culture of the Roman Near East. This is the same course as JSt 319 and may be taken only once for credit.

Crosslisted as: JSt 319.

Hst 320U - East Asian Civilizations (4)
Origins and development of East Asian civilizations from the earliest human cultures to around 1300. Focus on interactions between Chinese influences and indigenous traditions in Japan, Korea, and Vietnam; Confucianism, Buddhism, and other religious traditions; social organization, economies, and political institutions; cultural, artistic, and literary traditions. Recommended: upper-division standing.

Hst 320U - East Asian Civilizations (4)
Origins and development of East Asian civilizations from the earliest human cultures to around 1300. Focus on interactions...
between Chinese influences and indigenous traditions in Japan, Korea, and Vietnam; Confucianism, Buddhism, and other religious traditions; social organization, economies, and political institutions; cultural, artistic, and literary traditions. Recommended: upper-division standing.

Hst 321 - Early Modern East Asia, 1300-1800 (4)
East Asia from the era of the Mongol conquests through European contacts, encompassing the Yuan, Ming, and Qing dynasties in China, Choson Korea, and the Ashikaga through Tokugawa periods in Japan. Expected preparation: upper-division standing.

Hst 321U - Early Modern East Asia, 1300-1800 (4)
East Asia from the era of the Mongol conquests through European contacts, encompassing the Yuan, Ming, and Qing dynasties in China, Choson Korea, and the Ashikaga through Tokugawa periods in Japan. Expected preparation: upper-division standing.

Hst 322 - Modern East Asia (4)

Hst 322U - Modern East Asia (4)

Hst 323 - Modern Korea (4)
Examination of the modern history of Korea, including of the "two Koreas" (North Korea and South Korea) in the postwar period.

Hst 324 - United States Civil Rights Movements (4)
Surveys the history of post-1945 social movements in the United States that sought equality for racial minorities, ethnic groups, women, gays and lesbians, within the context of US citizenship.

Hst 325 - Mexican American/Chicano History I, 1492-1900 (4)
Mexican American/Chicano/a history from the Conquest of the Americas to 1900 with an emphasis on empire, civil rights, identity, culture, sexuality, and war. This is the same course as ChLa 325 and may be taken only once for credit.

Crosslisted as: ChLa 325.

Hst 326 - Mexican American/Chicano History II, 1900-Present (4)
Mexican American/Chicano/a history from 1900 to the present with an emphasis on migration, ethnicity, labor, civil rights, identity, and culture. This is the same course as ChLa 326 and may be taken only once for credit.

Crosslisted as: ChLa 326.

Hst 327 - U.S. History 1890-1932 (4)
A survey of political, social, cultural, and economic history covering Populism and the Crisis of the 1890s, the Purity Crusade, Corporate and Anticorporate Progressive Reform, World War I, the League of Nations and Red Scare of 1919-20, the New Era and Cultural Conflicts of the 1920s, and the 1929 stock market crash. In doing so, the class addresses the presidencies of William McKinley, Theodore Roosevelt, William Howard Taft, Woodrow Wilson, Warren G. Harding, Calvin Coolidge, and Herbert Hoover. Recommended preparation: upper-division standing.

Hst 327U - U.S. History 1890-1932 (4)
A survey of political, social, cultural, and economic history covering Populism and the Crisis of the 1890s, the Purity Crusade, Corporate and Anticorporate Progressive Reform, World War I, the League of Nations and Red Scare of 1919-20, the New Era and Cultural Conflicts of the 1920s, and the 1929 stock market crash. In doing so, the class addresses the presidencies of William McKinley, Theodore Roosevelt, William Howard Taft, Woodrow Wilson, Warren G. Harding, Calvin Coolidge, and Herbert Hoover. Recommended preparation: upper-division standing.

Hst 328 - U.S. History, 1932-1960 (4)
A survey of political, social, cultural, and economic history covering the Great Depression of the 1930s, Noninterventionist Sentiment and World War II, Cold War Domestic and International Anti-Communism, and the Early Civil Rights Movement. In doing so, the class addresses Franklin D. Roosevelt's New Deal and the presidencies of Harry Truman and Dwight D. Eisenhower. Recommended preparation: upper-division standing.

Hst 328U - U.S. History, 1932-1960 (4)
A survey of political, social, cultural, and economic history covering the Great Depression of the 1930s, Noninterventionist Sentiment and World War II, Cold War Domestic and International Anti-Communism, and the Early Civil Rights Movement. In doing so, the class addresses Franklin D. Roosevelt's New Deal and the presidencies of Harry Truman and Dwight D. Eisenhower. Recommended preparation: upper-division standing.

Hst 329 - U.S. History, 1960-Present (4)

Hst 329U - U.S. History, 1960-Present (4)
Hst 330 - Native Americans of Eastern North America (4)

Examines the origins of the Eastern Woodlands societies, surveys their culture around the time of European colonization, and considers how that culture changed in response to the arrival of Europeans to the North American continent. Traces the development of the major Indian nations of the region and explores how those nations responded to the Indian policy of the United States in the 19th and 20th centuries.

Hst 330U - Native Americans of Eastern North America (4)

Examines the origins of the Eastern Woodlands societies, surveys their culture around the time of European colonization, and considers how that culture changed in response to the arrival of Europeans to the North American continent. Traces the development of the major Indian nations of the region and explores how those nations responded to the Indian policy of the United States in the 19th and 20th centuries. Recommended prerequisite: upper division standing.

Hst 331 - Native Americans of Western North America (4)

Explores the history of peoples native to Western North America in the American Southwest and Pacific Coast regions, and in British Columbia. Covers the period from precontact to the present and considers the responses from native nations to the re-peopling of the West as well as examining U.S. and Canadian Indian policy.

Hst 331U - Native Americans of Western North America (4)

Explores the history of peoples native to Western North America in the American Southwest and Pacific Coast regions, and in British Columbia. Covers the period from precontact to the present and considers the responses from native nations to the re-peopling of the West as well as examining U.S. and Canadian Indian policy. Recommended prerequisite: upper division standing.

Hst 332 - History of the North American Fur Trade (4)

Examines the global fur trade in North America, including ocean and river transportation and exploration, the emergence of Metis populations, company cultures, and the migration of peoples to and within North America. Will address the Hawaiian Islands, Russian America, Canada, the Pacific Northwest, St. Louis and New Orleans.

Hst 332U - History of the North American Fur Trade (4)

Examines the global fur trade in North America, including ocean and river transportation and exploration, the emergence of Metis populations, company cultures, and the migration of peoples to and within North America. Will address the Hawaiian Islands, Russian America, Canada, the Pacific Northwest, St. Louis and New Orleans.

Hst 333 - Food and Power in US History (4)

Course uses the topic of food to better understand the history of American culture, environments, social relations, technology, territorial expansion, immigration, gender relations, agribusiness, and international politics. Topics move chronologically from the colonial period through the twenty-first century.

Hst 334 - History of Canada (4)

Survey of the social, economic, and political history of Canada from the sixteenth century to the present. Topics include colonialism, First Nations peoples, evolution of government, Canadian-U.S. relations.

Hst 334U - History of Canada (4)

Survey of the social, economic, and political history of Canada from the sixteenth century to the present. Topics include colonialism, First Nations peoples, evolution of government, Canadian-U.S. relations.

Hst 335 - Race and Ethnicity in U.S. History (4)

This course studies the history, meaning and construction of racial and ethnic identities in the U.S. from European colonialism to present. It engages the ways in which social practices, science, economics, cultural images, and local and federal laws worked to attach meaning to the ideologies of racial and ethnic identities.

Hst 335U - Race and Ethnicity in U.S. History (4)

This course studies the history, meaning and construction of racial and ethnic identities in the U.S. from European colonialism to present. It engages the ways in which social practices, science, economics, cultural images, and local and federal laws worked to attach meaning to the ideologies of racial and ethnic identities.

Hst 336 - Lewis and Clark and the American West (4)

The importance of the Lewis and Clark expedition for the history of the American West. Special emphasis on the prologue to the expedition and its environmental, political, economic, scientific, social, and intellectual legacies. Covers the period from the end of the American Revolution to 1840. Recommended prerequisite: upper division standing.

Hst 336U - Lewis and Clark and the American West (4)

The importance of the Lewis and Clark expedition for the history of the American West. Special emphasis on the prologue to the expedition and its environmental, political, economic, scientific, social, and intellectual legacies. Covers the period from the end of the American Revolution to 1840. Recommended prerequisite: upper division standing.

Hst 337 - History of American Cities (4)

Traces the evolution of urban centers from the colonial period to the present. Focuses on the developing system of cities, on growth within cities, and on the expansion of public responsibility for the welfare of urban residents. Particular attention is given to the industrial and modern eras.

Hst 337U - History of American Cities (4)

Traces the evolution of urban centers from the colonial period to the present. Focuses on the developing system of cities, on growth within cities, and on the expansion of public responsibility for the welfare of urban residents. Particular attention is given to the industrial and modern eras. Recommended prerequisite: upper division standing.

Hst 338 - Oregon History (4)

Explores the political and social history of the area most of us call home: Oregon Country, Oregon Territory, and the state of Oregon. Through lectures, readings, film, and discussion we will examine the connections between the local, national, and international as they pertain to this place. Topics considered include Oregon as Indian Country, Black Exclusion laws, the natural
Hst 338U - Oregon History (4)
Explores the political and social history of the area most of us call home: Oregon Country, Oregon Territory, and the state of Oregon. Through lectures, readings, film, and discussion we will examine the connections between the local, national, and international as they pertain to this place. Topics considered include Oregon as Indian Country, Black Exclusion laws, the natural resource economy, the Tom McCall era, and Rajneeshees as new pioneers. Recommended prerequisite: upper division standing.

Hst 339U - The Environment and History (4)
Introduction to the global history of human interactions with the environment from antiquity to the present, with a special focus on the history of political, social, cultural, and economic forces that have produced modern relationships to nature. Designed as an introductory course for students of all majors. Expected preparation: upper-division standing.

Hst 339 - The Environment and History (4)
Introduction to the global history of human interactions with the environment from antiquity to the present, with a special focus on the history of political, social, cultural, and economic forces that have produced modern relationships to nature. Designed as an introductory course for students of all majors. Expected preparation: upper-division standing.

Hst 340 - Women and Gender in America to 1848 (4)
Surveys the history of women in the middle North American continent to 1848. It highlights the experiences of and relationships among women of diverse origins, especially Native women, African women, and European women. Key themes include family, kinship, and sex-gender systems; colonialism and slavery; religious life; politics and the law; nation-building and the rise of modern citizenship.

Hst 340U - Women and Gender in America to 1848 (4)
Surveys the history of women in the middle North American continent to 1848. It highlights the experiences of and relationships among women of diverse origins, especially Native women, African women, and European women. Key themes include family, kinship, and sex-gender systems; colonialism and slavery; religious life; politics and the law; nation-building and the rise of modern citizenship. Recommended prerequisite: upper division standing.

Hst 341 - Women and Gender in the United States 1848-1920 (4)
Explores the diverse experiences of women in the United States between 1848 and 1920. Key themes include slavery, emancipation, and Reconstruction; colonialism and resistance; women’s rights and social reform; education and wage labor; immigration/migration; and Victorianism and sexual modernism.

Hst 341U - Women and Gender in the United States 1848-1920 (4)
Explores the diverse experiences of women in the United States between 1848 and 1920. Key themes include slavery, emancipation, and Reconstruction; colonialism and resistance; women’s rights and social reform; education and wage labor; immigration/migration; and Victorianism and sexual modernism. Recommended prerequisite: upper division standing.

Hst 342 - Women and Gender in the U.S. 1920 to the Present (4)
Surveys women's lives and gender change in recent U.S. history. Among our themes will be women in politics, the work force, and social movements as well as changes in family life, gender identities, and sexuality. Women's roles in globalization, the media, and popular culture will figure throughout.

Hst 342U - Women and Gender in the U.S. 1920 to the Present (4)
Surveys women's lives and gender change in recent U.S. history. Among our themes will be women in politics, the work force, and social movements as well as changes in family life, gender identities, and sexuality. Women's roles in globalization, the media, and popular culture will figure throughout. Recommended prerequisite: upper division standing.

Hst 343 - American Family History (4)
History of the American family from the colonial period to the present. The course will draw upon textual sources and oral histories in examining changes in families from the colonial period through the nineteenth and twentieth centuries.

Hst 343U - American Family History (4)
History of the American family from the colonial period to the present. The course will draw upon textual sources and oral histories in examining changes in families from the colonial period through the nineteenth and twentieth centuries. Recommended prerequisite: Hst 201 or 202, or Sophomore Inquiry (American Studies). Recommended prerequisite: upper division standing.

Hst 344 - Culture, Religion, Politics: Jews and Judaism in America Since World War Two (4)
Surveys significant religious, cultural, and political developments in American Jewry since the end of World War Two. Topics include the impact of the war and the Holocaust; liberalism, radicalism, and neoconservatism; suburbia; the counterculture; the fading of immigrant memory; Jewish feminism; the orthodox revival; relations with African-Americans and other minority groups; and the relationship between American Jewry and the State of Israel. Recommended: upper division standing.

Hst 344U - Culture, Religion, Politics: Jews and Judaism in America Since World War Two (4)
Surveys significant religious, cultural, and political developments in American Jewry since the end of World War Two. Topics include the impact of the war and the Holocaust; liberalism, radicalism, and neoconservatism; suburbia; the counterculture; the fading of immigrant memory; Jewish feminism; the orthodox revival; relations with African-Americans and other minority groups; and the relationship between American Jewry and the State of Israel. Recommended: upper division standing.

Hst 345 - Colonial America, 1607-1756 (4)
Survey of British North America from the planting of the English colonies to the eve of the Seven Years' War. Topics include
relations between Europeans and Native Americans, women's status and roles, religious ferment, constitutional development, and the colonial economy.

**Hst 346 - The American Revolution, 1756-1800 (4)**

Survey of the American Revolution from its origins to the Early Republic. Topics include the pre-Revolutionary crises, the War of Independence, the Confederation, and the framing of the Constitution.

**Hst 346U - The American Revolution, 1756-1800 (4)**

Survey of the American Revolution from its origins to the Early Republic. Topics include the pre-Revolutionary crises, the War of Independence, the Confederation, and the framing of the Constitution. Recommended prerequisite: upper division standing.

**Hst 347 - Antebellum America, 1800-1850 (4)**

Survey of the history of the United States from 1800 to 1850. Topics include the War of 1812, U.S. territorial expansion, Jacksonian democracy, Indian removal, reform movements, the transportation revolution, and the development of the market economy.

**Hst 347U - Antebellum America, 1800-1850 (4)**

Survey of the history of the United States from 1800 to 1850. Topics include the War of 1812, U.S. territorial expansion, Jacksonian democracy, Indian removal, reform movements, the transportation revolution, and the development of the market economy. Recommended prerequisite: upper division standing.

**Hst 348 - Slavery, the American Civil War, and Reconstruction, 1850-1877 (4)**

Survey of the history of slavery in the United States. Topics include the political, social, and economic circumstances that helped bring on the American Civil War, as well as the military history of the war, the consequences of the conflict, and the reconstruction of the Union.

**Hst 348U - Slavery, the American Civil War, and Reconstruction, 1850-1877 (4)**

Survey of the history of slavery in the United States. Topics include the political, social, and economic circumstances that helped bring on the American Civil War, as well as the military history of the war, the consequences of the conflict, and the reconstruction of the Union. Recommended prerequisite: upper division standing.

**Hst 349 - United States Indian Policy (4)**

Examines the history of the United States government's policy toward the Indian nations of North America. In particular, considers the Indian policies of the European imperial powers, the federal government's creation and implementation of Indian policy, the conflicts and relationships between tribal nations and the state and federal governments, the origin of the Indian sovereignty movement, and the construction of tribal sovereignty by the state and federal courts of the United States.

**Hst 349U - United States Indian Policy (4)**

Examines the history of the United States government's policy toward the Indian nations of North America. In particular, considers the Indian policies of the European imperial powers, the federal government's creation and implementation of Indian policy, the conflicts and relationships between tribal nations and the state and federal governments, the origin of the Indian sovereignty movement, and the construction of tribal sovereignty by the state and federal courts of the United States. Recommended prerequisite: upper division standing.

**Hst 350 - English History from 1066 to 1660 (4)**

Designed to survey the history of England from the conquest in 1066 through the English Civil Wars and the ensuing period when England was without its monarchy in the mid-seventeenth century. Using a lecture/discussion format, explores significant events and developments in the governance, society, economy, and religion of England during this period. Recommended prerequisite: upper division standing.

**Hst 351 - English History from 1660 to the Present (4)**

Designed to survey the history of England from the restoration of the monarchy in 1660 to the present time. Using a lecture/discussion format, explores significant events and developments in the governance, society, economy, and religion of England during this period.

**Hst 351U - English History from 1660 to the Present (4)**

Designed to survey the history of England from the restoration of the monarchy in 1660 to the present time. Using a lecture/discussion format, explores significant events and developments in the governance, society, economy, and religion of England during this period. Recommended prerequisite: upper division standing.

**Hst 352 - European Women's History to 1700 (4)**

An upper-division course designed to survey the history of women and the changing social construction of gender in Europe from c. 1000 to c. 1700. Explores the impact of social, intellectual, economic, and political changes, as well as significant events such as the Black Death and recurring religious change.

**Hst 352U - European Women's History to 1700 (4)**

An upper-division course designed to survey the history of women and the changing social construction of gender in Europe from c. 1000 to c. 1700. Explores the impact of social, intellectual, economic, and political changes, as well as significant events such as the Black Death and recurring religious change. Recommended prerequisite: upper-division standing.
Hst 354 - Early Medieval Europe: 300-1100
(4)
A survey of political, cultural, intellectual, religious, social, and economic aspects of this 800-year period, including among other topics the decline of Roman power in Western Europe, the spread of Christianity, the rise of the Franks, the Carolingian Empire, the growth of feudal ties, and the gradual creation of a high-level civilization.

Hst 354U - Early Medieval Europe: 300-1100
(4)
A survey of political, cultural, intellectual, religious, social, and economic aspects of this 800-year period, including among other topics the decline of Roman power in Western Europe, the spread of Christianity, the rise of the Franks, the Carolingian Empire, the growth of feudal ties, and the gradual creation of a high-level civilization. Recommended prerequisite: upper division standing.

Hst 355 - Late Medieval Europe, 1100-1450
(4)
An examination of the late Middle Ages through primary sources with an emphasis on cultural, social, political, and intellectual transformations. Subjects to be treated include the twelfth-century cultural "renaissance," the emergence of the European state and papal monarchy, the rise of religious dissent and anti-Semitism, the transformation of medieval spirituality, the Crusades, European expansion and external encounters, growth of cities and the university, the debate between faith and reason, the Black Death, and late medieval decline. Recommended prerequisite: upper division standing.

Hst 355U - Late Medieval Europe, 1100-1450
(4)
An examination of the late Middle Ages through primary sources with an emphasis on cultural, social, political, and intellectual transformations. Subjects to be treated include the twelfth-century cultural "renaissance," the emergence of the European state and papal monarchy, the rise of religious dissent and anti-Semitism, the transformation of medieval spirituality, the Crusades, European expansion and external encounters, growth of cities and the university, the debate between faith and reason, the Black Death, and late medieval decline. Recommended prerequisite: upper division standing.

Hst 356 - Renaissance and Reformation Europe, 1400-1600
(4)
Surveys the cultural, social, intellectual and political aspects of the European Renaissance and Reformation. Emphasis placed on learning to read and analyze contemporary source materials, and examination of the growth of urban culture and civic humanism in Italy, the rediscovery of classical literature and philosophy, court life and mores, the rise and institutionalization of religious reform, the institutional transformations of Church and State, and European exploration and exploitation of the Atlantic. Recommended prerequisite: upper division standing.

Hst 356U - Renaissance and Reformation Europe, 1400-1600
(4)
Surveys the cultural, social, intellectual and political aspects of the European Renaissance and Reformation. Emphasis placed on learning to read and analyze contemporary source materials, and examination of the growth of urban culture and civic humanism in Italy, the rediscovery of classical literature and philosophy, court life and mores, the rise and institutionalization of religious reform, the institutional transformations of Church and State, and European exploration and exploitation of the Atlantic. Recommended prerequisite: upper division standing.

Hst 357 - Europe from Reformation to Revolutions
(4)
Major developments in European social, political, economic, cultural, and intellectual history from the late 16th through the mid-19th centuries.

Hst 357U - Europe from Reformation to Revolutions
(4)
Major developments in European social, political, economic, cultural, and intellectual history from the late 16th through the mid-19th centuries. Recommended prerequisite: Hst 102 or upper division standing.

Hst 358 - Europe from National Unification to European Union
(4)
Major events (World Wars I and II), socio-political movements (communism, fascism, Nazism), people, and themes in European history from the mid-19th century to the present. Recommended prerequisite: Hst 103 or upper-division standing.

Hst 358U - Europe from National Unification to European Union
(4)
Major events (World Wars I and II), socio-political movements (communism, fascism, Nazism), people, and themes in European history from the mid-19th century to the present. Recommended prerequisite: Hst 103 or upper-division standing.

Hst 359 - Early Modern France (4)
A survey of the history of France during the Reformation, the Age of Absolutism, and the Enlightenment, 1515-1778.

Hst 359U - Early Modern France (4)
A survey of the history of France during the Reformation, the Age of Absolutism, and the Enlightenment, 1515-1778. Recommended prerequisite: upper division standing.

Hst 360 - The French Revolution and Napoleon (4)
A survey of the history of France during the Revolution and Napoleonic era, 1778-1815.

Hst 360U - The French Revolution and Napoleon (4)
A survey of the history of France during the Revolution and Napoleonic era, 1778-1815. Recommended prerequisite: upper division standing.

Hst 361 - Modern France & the World since 1815 (4)
Examines the France and its role in the world from 1815 to present, including revolutions, restorations, empire, world wars and national identity.

Hst 362 - Amazon Rain Forest (4)
Examines different ways in which the Amazon has been perceived through time. This course is the same as Intl 362; course may only be taken once for credit.

Hst 362U - Amazon Rain Forest (4)
Examines different ways in which the Amazon has been perceived through time. This course is the same as Intl 362; course may only be taken once for credit.

Crosslisted as: Intl 362.

Hst 363 - History of the British Empire (4)
Surveys four centuries of the expansion and decline of the British Empire. Emphasis on the military, political and economic history

**Hst 364 - Modern Brazil (4)**
Examines such topics as slavery, abolition, messianism, banditry, the Amazon, race, military rule, and democratization in the making of modern Brazil. This course is the same as Intl 364 and may only be taken once for credit.

**Hst 364U - Modern Brazil (4)**
Examines such topics as slavery, abolition, messianism, banditry, the Amazon, race, military rule, and democratization in the making of modern Brazil. This course is the same as Intl 364 and may only be taken once for credit.

**Hst 365 - Latin America (4)**
A survey from pre-Columbian times to the present. Hst 365: Period of discovery and conquest, colonial institutions, the age of reform. Hst 366: Independence and rise of the new nations, the recent period. This is the first course in a sequence of two: Hst 365 and Hst 366.

**Hst 365U - Latin America (4)**
A survey from pre-Columbian times to the present. Hst 365: Period of discovery and conquest, colonial institutions, the age of reform. Hst 366: Independence and rise of the new nations, the recent period. This is the first course in a sequence of two: Hst 365 and Hst 366. Recommended prerequisite: Hst 101, 102, or Sophomore Inquiry (Latin America).

**Hst 366 - Latin America (4)**
A survey from pre-Columbian times to the present. Hst 365: Period of discovery and conquest, colonial institutions, the age of reform. Hst 366: Independence and rise of the new nations, the recent period. This is the second course in a sequence of two: Hst 365 and Hst 366.

**Hst 366U - Latin America (4)**
A survey from pre-Columbian times to the present. Hst 365: Period of discovery and conquest, colonial institutions, the age of reform. Hst 366: Independence and rise of the new nations, the recent period. This is the second course in a sequence of two: Hst 365 and Hst 366. Recommended prerequisite: Hst 101, 102, or Sophomore Inquiry (Latin America).

**Hst 367 - History of Food in Latin America (4)**
Examines the history of key foods, both plant and animal, before and since 1492, focusing on how they influenced the social, cultural and political development of societies.

**Hst 368 - Brazil and Mexico in the 20th Century (4)**
A comparative history of these rising powers of Latin America, including economic, diplomatic and cultural history, and the history of revolution, popular protest, spirituality and the visual arts.

**Hst 370 - Eurotopia: Creating & Contesting the European Union (4)**
Examines the intellectual, political, and economic challenges to forging European unity, and the paradox that twentieth-century Europe witnessed the triumph of the nation-state at the same time that they developed supranational agencies to contain it.

**Hst 375 - History of Kievan and Muscovite Russia, 800s-1700 (4)**
Explores Kievan Rus and Muscovite Russia. Emphasis on political change, social conflicts, and identity formation through the appanage period. Mongol rule, the rise of Muscovy, and territorial expansion.

**Hst 375U - History of Kievan and Muscovite Russia, 800s-1700 (4)**
Explores Kievan Rus and Muscovite Russia. Emphasis on political change, social conflicts, and identity formation through the appanage period. Mongol rule, the rise of Muscovy, and territorial expansion.

**Hst 376 - History of Imperial Russia, 1700-1917 (4)**
Studies the Russian Empire from its founding to the Russian Revolution of 1917. Emphasis on attempts at reform, and on political and cultural identity formation of various social groups and nationalities of the empire. Expected preparation: upper-division standing.

**Hst 377 - History of the Soviet Union and Post-Soviet Russia (4)**
Studies the Soviet Union from its founding in 1917 to the early post-Soviet period. Emphasis on socialism as theory and policy, and on political and cultural identity formation of various social groups and nationalities of the Soviet Union. Expected preparation: upper-division standing.

**Hst 377U - History of the Soviet Union and Post-Soviet Russia (4)**
Studies the Soviet Union from its founding in 1917 to the early post-Soviet period. Emphasis on socialism as theory and policy, and on political and cultural identity formation of various social groups and nationalities of the Soviet Union. Expected preparation: upper-division standing.

**Hst 378 - Pagans, Christians and Jews (4)**
Discusses the development and interaction of Roman paganism, Christianity and Judaism during the period of Late Antiquity. Topics include education, philosophy, asceticism, ritual, religious law, the image of the holy man and the phenomenon of religious polemic in the Later Roman Empire (c. 250-600 CE). This is the same course as JSt 378 and may be taken only once for credit.

**Crosslisted as: JSt 378.**

**Hst 378U - Pagans, Christians and Jews (4)**
Discusses the development and interaction of Roman paganism, Christianity and Judaism during the period of Late Antiquity. Topics include education, philosophy, asceticism, ritual, religious law, the image of the holy man and the phenomenon of religious polemic in the Later Roman Empire (c. 250-600 CE). This is the same course as JSt 378 and may be taken only once for credit.

**Crosslisted as: JSt 378U.**
Hst 379U - History of Zionism (4)
Zionism as ideology and practice in context of Jewish and European history. Includes society and culture Zionism created under the British mandate of Palestine, roots of the Arab-Jewish conflict in this context, and impact on Jewish life and politics in Eastern and Central Europe and the United States. Crosslisted as: JSt 379U. This is the same course as JSt 379 and can only be taken once for credit.

Hst 379U - History of Zionism (4)
Zionism as ideology and practice in context of Jewish and European history. Includes society and culture Zionism created under the British mandate of Palestine, roots of the Arab-Jewish conflict in this context, and impact on Jewish life and politics in Eastern and Central Europe and the United States. Crosslisted as: JSt 379. This is the same course as JSt 379 and can only be taken once for credit.

Hst 380U - The Holocaust (4)
An introduction to the Nazi-planned and executed genocide of European Jewry known as the Holocaust. Topics include the German and European contexts for the rise of Nazism; antisemitism and its links to Nazi ideology and policy; European Jewry in the interwar period; the "Final Solution"; resistance and "bystanders." This is the same course as JSt 380 and may be taken only once for credit.

Hst 380U - The Holocaust (4)
An introduction to the Nazi-planned and executed genocide of European Jewry known as the Holocaust. Topics include the German and European contexts for the rise of Nazism; antisemitism and its links to Nazi ideology and policy; European Jewry in the interwar period; the "Final Solution"; resistance and "bystanders." This is the same course as JSt 380 and may be taken only once for credit.

Hst 381U - Kabbalah: The Jewish Mystical Tradition (4)
Surveys the origins and development of the Jewish mystical tradition set against the context of Jewish religious, social, and intellectual history. Topics include mystical visions in ancient Jewish texts, medieval Kabbalah and the Zohar, the Sabbatean messianic movement, Hasidism, and contemporary uses of Kabbalah. This is the same course as JSt 381 and may be taken only once for credit.

Hst 381U - Kabbalah: The Jewish Mystical Tradition (4)
Surveys the origins and development of the Jewish mystical tradition set against the context of Jewish religious, social, and intellectual history. Topics include mystical visions in ancient Jewish texts, medieval Kabbalah and the Zohar, the Sabbatean messianic movement, Hasidism, and contemporary uses of Kabbalah. This is the same course as JSt 381 and may be taken only once for credit.

Hst 385 - The Modern Middle East I (4)
A two-quarter survey of the social, cultural, economic, and political history of the Middle East from the eighteenth century to the present day. Hst 385: The Modern Middle East I. Overview of the Ottoman and Qajar Empires from the 18th century till the outbreak of World War I. Coverage of key themes such as imperialism, political reform, sectarianism, constitutionalism, and revolution. Hst 386: The Modern Middle East II. Overview of the Middle East since World War I. Discussion of colonialism and nationalism, emergence of mass society, economic development, birth of the Arab-Israeli conflict, Cold War, oil, and the rise of political Islam. This is the second course in a sequence of two: Hst 385 and Hst 386.

Hst 386U - The Modern Middle East II (4)
A two-quarter survey of the social, cultural, economic, and political history of the Middle East from the eighteenth century to the present day. Hst 385: The Modern Middle East I. Overview of the Ottoman and Qajar Empires from the 18th century till the outbreak of World War I. Coverage of key themes such as imperialism, political reform, sectarianism, constitutionalism, and revolution. Hst 386: The Modern Middle East II. Overview of the Middle East since World War I. Discussion of colonialism and nationalism, emergence of mass society, economic development, birth of the Arab-Israeli conflict, Cold War, oil, and the rise of political Islam. This is the second course in a sequence of two: Hst 385 and Hst 386.

Hst 385 - The Modern Middle East I (4)
A two-quarter survey of the social, cultural, economic, and political history of the Middle East from the eighteenth century to the present day. Hst 385: The Modern Middle East I. Overview of the Ottoman and Qajar Empires from the 18th century till the outbreak of World War I. Coverage of key themes such as imperialism, political reform, sectarianism, constitutionalism, and revolution. Hst 386: The Modern Middle East II. Overview of the Middle East since World War I. Discussion of colonialism and nationalism, emergence of mass society, economic development, birth of the Arab-Israeli conflict, Cold War, oil, and the rise of political Islam. This is the second course in a sequence of two: Hst 385 and Hst 386.

Hst 387 - History of Modern Science (4)
Examines the interplay between science as a system of knowledge and science as the institutions by which that knowledge is produced. Through reading, lectures, independent research, and discussion, the course explores how the science has affected and been affected by political, social, and cultural developments. Primary focus is Europe and America from the 16th century to the present, but global perspectives will also be considered. Recommended: upper division standing.
Hst 387U - History of Modern Science (4)
Examines the interplay between science as a system of knowledge and science as the institutions by which that knowledge is produced. Through reading, lectures, independent research, and discussion, the course explores how the science has affected and been affected by political, social, and cultural developments. Primary focus is Europe and America from the 16th century to the present, but global perspectives will also be considered. Recommended: upper division standing.

Hst 399 - Special Studies (1-12)
See department for course description. (Credit to be arranged.)

Hst 401 - Research (0-6)
See department for course description. (Credit to be arranged.) Consent of instructor.

Hst 403 - Honors Thesis (1-4)
(Credit to be arranged.)

Hst 404 - Public History Internship (1-12)
Intensive, on-the-job internships with public agencies, private businesses, non-profit firms, and other groups in public history work. Each internship is by special arrangement and terms. Also offered for graduate-level credit as Hst 504. Recommended prerequisite: Hst 496/596, or consent of instructor.

Hst 405 - Reading and Conference (0-9)
(Credit to be arranged.)

Hst 407 - Seminar (1-8)
Study and application of the techniques of historical research and writing. Also offered for graduate-level credit as Hst 507. Prerequisite: Hst 300 and Hst 405 or consent of the instructor.

Hst 409 - Public History Seminar (0-9)
Engages students in advanced investigation of special topics in public history work, including archives, oral history, project design, history on the Web, and others. Seminars will feature technical readings, group work, peer evaluation, and written projects. Required for graduate students taking the public history track option. Also offered for graduate-level credit as Hst 509. (Credit to be arranged.)

Hst 410 - Selected Topics (1-6)
See department for course description. (Credit to be arranged)

Hst 411 - Public History Lab (4)
Lab course will focus on a specific sub-field in Public History. Working professionals will instruct students in the latest techniques used in public history work. One lab course is required for graduate students taking the public history track in the M.A. in history. Also offered for graduate-level credit as Hst 511. Prerequisite: Hst 496/596.

Hst 412 - Topics in African History and Culture (4)
An in-depth exploration of selected topics in African cultural history. Special attention will be given to thematic issues of broad application to the understanding of cultural interaction, continuity, and change. The subject matter will vary from term to term. (Maximum number of credits is 12; 4 credits each for three courses with different topics.) Also offered for graduate-level credit as Hst 512. Prerequisite: upper-division standing.

Hst 413 - Topics in Transnationalism (4)
Examines human activities, institutional structures, and social movements that cross national boundaries. Topics include migration, diaspora, and activism, as well as flow of ideas, goods, and technologies among people or regions not defined primarily by the nation-state. Frameworks for study include border zones, deterritorialized nations or peoples, and global citizenship. Also offered for graduate-level credit as Hst 513. Prerequisite: Upper-division standing.

Hst 415 - Topics in Greek History (4)
An advanced look at specific topics in Greek history from the Bronze Age to the death of Cleopatra. Topics will include social, political, economic, intellectual, and religious history. The subject matter will vary from term to term. (Maximum number of credits is 12; 4 credits each for three courses with different topics.) Also offered for graduate-level credit as Hst 515. Prerequisite: Upper-division standing.

Hst 416 - Topics in Roman History (4)
An advanced look at specific topics in Roman history from the Etruscans to the Dark Ages. Topics will include social, political, economic, and intellectual history. The subject matter will vary from term to term. (Maximum number of credits is 12; 4 credits each for three courses with different topics.) Also offered for graduate-level credit as Hst 516. Prerequisite: Upper division standing.

Hst 420 - Topics in Early Modern Japanese History (4)
Selected themes in modern Japanese history, including the construction of the nation-state, modernization, Japan’s drive to great power status, Japan’s emergence as an imperialist power, state-society relations, and modernity outside Europe. (Maximum number of credits is 12; 4 credits each for three courses with different topics.) Also offered for graduate-level credit as Hst 520. Prerequisite: Upper-division standing.

Hst 421 - Topics in Modern Japanese History (4)
Selected themes in modern Japanese history, including the construction of the nation-state, modernization, Japan’s drive to great power status, Japan’s emergence as an imperialist power, state-society relations, and modernity outside Europe. (Maximum number of credits is 12; 4 credits each for three courses with different topics.) Also offered for graduate-level credit as Hst 521. Prerequisite: Upper-division standing.

Hst 422 - Topics in Postwar Japanese History, 1945-present (4)
Selected themes in postwar Japanese history, including the Occupation reforms (1945-52) and Japan’s place in the Cold War system, the so-called “economic miracle,” the development of a mass consumer culture, and U.S.-Japan relations. (Maximum number of credits is 12; 4 credits each for three courses with different topics.) Also offered for graduate-level credit as Hst 522. Prerequisite: Upper-division standing.

Hst 423 - Topics in Chinese Social History (4)
This course will examine institutions and themes relating to the family, urban and rural life, education and the like in Chinese
under Nazism, science and Modernism, topics include: science and religion, science subject matter will vary from term to term; cultural, social, or political relations. The theme in the history of science and its An in-depth investigation of a selected Hst 427 - Topics in the History of Science (4) (Maximum number of credits is 12; 4 credits each for three courses with different topics.) Also offered for graduate-level credit as Hst 524. Prerequisite: Upper-division standing.

Hst 425 - Modern China (4) History of China from decline of imperial system through century of revolution that culminated in founding of People's Republic of China in 1949. Post-1949 focus on critical periods and issues in state-society relations, economic and political reform, and cultural changes, including global posture and relations with the West. Also offered for graduate-level credit as Hst 525. Prerequisite: Upper-division standing.

Hst 427 - Topics in the History of Science (4) An in-depth investigation of a selected theme in the history of science and its cultural, social, or political relations. The subject matter will vary from term to term; topics include: science and religion, science under Nazism, science and Modernism, Darwinism and social Darwinism, Scientific Revolution, and changing physical world pictures. Some previous study in history is recommended; a background in science is welcome, but not required or expected. (Maximum number of credits is 12; 4 credits each for three courses with different topics.) Also offered for graduate-level credit as Hst 527. Recommended prerequisite: upper division standing.

Hst 429 - Topics in U.S. Cultural History (4) A lecture course that explores selected topics in modern U.S. political culture and cultural expression. Maximum number of credits is 12; 4 credits each for three courses with different topics. Also offered for graduate-level credit as Hst 529. Expected preparation: upper-division standing.

Hst 430 - Roots of American Culture (4) Relation of cultural attitudes and values to the American historical experience from 1600-1860. Topics include the European legacy; Puritanism; race, class, and ethnicity; American Enlightenment and Revolution; Cultural Nationalism; Industrial Ethnic and Pastoralism; Jacksonian Democracy; Manifest Destiny and Native Americans; Slavery and African American Culture; Evangelicalism, Reform, Abolitionism, and Feminism. Also offered for graduate-level credit as Hst 530 and may be taken only once for credit.

Prerequisite: Upper-division standing.

Hst 431 - Rise of American Corporate Culture (4) Relation of cultural attitudes and values to the American historical experience from 1860-1945. Topics include Civil War and Reconstruction; Incorporation, Labor Reform, and Utopian Thought; Populism; Progressive Reform; Two Cultures of the 1920s; Depression Realism and Radicalism; World War II and the Judeo-Christian Consensus. Also offered for graduate-level credit as Hst 531 and may be taken only once for credit.

Prerequisite: Upper-division standing.

Hst 432 - Recent U.S. Political Culture (4) Relation of cultural attitudes and values to the American historical experience from 1945 to the present. Topics include Anti-Communist, Nationalist, and Anticorporate Insurgence in the 1950s; Antiwar, Racial, Counterculture, and Feminist Ferment in the Protest Era; New Age and Postmodernist Thought; Populist Conservatism and Traditional Values, 1980-present. Also offered for graduate-level credit as Hst 532 and may be taken only once for credit.

Prerequisite: Upper-division standing.

Hst 433 - American Social and Intellectual History, 1600-1865 (4) Examines early history of American social and intellectual history, including issues of race, class, religion and philosophy, ideology and politics, community, region, and labor. Also offered for graduate-level credit as Hst 533 and may be taken only once for credit.

Prerequisite: Upper-division standing.

Hst 434 - U.S. Social and Intellectual History, 1865-present (4) Examines social and intellectual history of the United States from 1865 to the present. Includes discussion of race, class, religion and philosophy, ideology and politics, community, region, and labor. Also offered for graduate-level credit as Hst 534 and may be taken only once for credit.

Prerequisite: Upper-division standing.

Hst 438 - American Economic History: the First Century (4) The economic background of the War of Independence and the seeds of the Civil War. Industrialization, urbanization, and development of the frontier. Rise of big business and organized labor. Laissez faire, federalism, and the gradual emergence of the national government in economic policy. Changes in foreign trade and in the international position of the U.S. Also offered for graduate-level credit as Hst 538 and may be taken only once for credit. Recommended prerequisites: Ec 201, 202.


Hst 440 - American Environmental History (4) A survey of North American history that explores the relationships between ideas of nature, transformations of the environment, and the effect of the environment on humans. Topics include colonialism; links between ecological change and race, class, and gender relations; the role of science/technology; agriculture, industrialization, and urbanization; and environmentalism. Also offered for graduate-level credit as Hst 540 and may be taken only once for credit.
Hst 442 - Race, Class and Gender in the American West (4)
Examines the trans-Mississippi West as a cultural meeting ground and explores the racial, class, and gender implications of new migrations to the region. Particular attention will be placed on the arid West and human responses to landscape. Also offered for graduate-level credit as Hst 542 and may be taken only once for credit. Recommended prerequisite: Hst 201, 202 or upper division standing.

Hst 444 - History of the Pacific Northwest (4)
The social, cultural, economic, and political aspects of the development of civilization in Oregon and Washington. The history of the region is related to national and international contexts. Also offered for graduate-level credit as Hst 544 and may be taken only once for credit. Recommended prerequisite: Hst 201, 202.

Hst 445 - History of Portland (4)
The historical growth of Portland and its metropolitan region, with major attention given to the 20th century. Emphasis is placed upon the process of urbanization and the consequences of the past decisions and actions as they relate to recent developments. Also offered for graduate-level credit as Hst 545 and may be taken only once for credit. Recommended prerequisite: upper division standing.

Hst 446 - Civil Rights and the Law: The History of Equal Protection (4)
An exploration of the history of the 14th Amendment Equal Protection Clause’s impact on the civil rights of Women, African Americans, Mexican Americans, and others.
Prerequisite: upper-division standing.

Hst 447 - U.S Constitutional History: Foundations (4)
Examines the intellectual origins, creation, and ratification of the American Constitution and the early efforts of the U.S. Supreme Court to construe that document. Also offered for graduate-level credit as Hst 547 and may be taken only once for credit.
Prerequisite: Upper-division standing.

Hst 448 - U.S. Constitution: Nineteenth Century (4)
Examines the U.S. Supreme Court’s role in the construction of modern America; includes discussion of the Court’s decisions on federalism, slavery, presidential war powers, Reconstruction and civil rights, and industrialization. Also offered for graduate-level credit as Hst 548 and may be taken only once for credit.
Prerequisite: Upper-division standing.

Hst 449 - U.S. Constitution: Twentieth Century (4)
Examines how the U. S. Supreme Court’s decisions in the twentieth century impacted the national economy, federalism, and the civil rights and civil liberties of American citizens. Also offered for graduate-level credit as Hst 549 and may be taken only once for credit. Recommended prerequisite: Upper-division standing.

Hst 450 - Medieval England (4)
Examines political, religious, social, and economic aspects of the history of England from approximately 800 to the end of the 14th century. Also offered for graduate-level credit as Hst 550 and may be taken only once for credit. Recommended prerequisite: upper division standing or permission of instructor.

Hst 451 - Early Modern England (4)
Examines political, religious, social, and economic aspects of the history of England from the 15th through the 17th centuries. Also offered for graduate-level credit as Hst 551 and may be taken only once for credit. Recommended prerequisite: upper division standing.

Hst 452 - Topics in the History of European Women (4)
Examines selected aspects of the history of European women, focusing on one or more specific regions, topics, and/or time frames. Possible topics include aspects of the history of women and religion, women and work, women accessing power, and gender and religious identity. Maximum number of credits is 12; 4 credits each for three courses with different topics. Also offered for graduate-level credit as Hst 552. Expected preparation: upper-division standing.

Hst 453 - The Medieval City: Communities of Conflict and Consensus (4)
Emphasizes the social and cultural history of the medieval city from ca. 300-1500. Proceding chronologically and thematically, explores how contemporaries imagined cities and urban life; the formation of civic consciousness and identity in feudal Europe; the commercial revolution and its cultural consequences; family and domestic life; the experience of marginalized elements; the construction, regulation, and function of urban space; and the role of spectacle, ceremony, and ritual, all as means to assess how the urban community mediated conflict and sought elusive consensus. Also offered for graduate-level credit as Hst 553 and may be taken only once for credit. Recommended prerequisites: Hst 101, 354, or 355 or upper division standing.

Hst 454 - Topics in Medieval History (4)
Examines selected topics in the social, cultural, and/or religious history of the European Middle Ages, spanning the period from roughly 300-1450 C.E. Topics will vary, but may include the study of sanctity and society, religious dissent and reformation of the church, holy war and crusade, regional and national political histories, cross-cultural studies, and other subjects. (Maximum number of credits is 12; 4 credits each for three courses with different topics.) Also offered for graduate-level credit as Hst 554. Recommended prerequisites: Hst 101, 354, or 355 or upper division standing.

Hst 455 - Topics in Renaissance History (4)
Identifies and examines those special aspects of Western European civilization that mature roughly between 1300 and 1550 and that begin to set it apart from the medieval era. Not a survey of life during a period of time but a study of selected phenomena. Topics include the revival of antique (above all Latin and Greek) letters and attitudes, types of Humanism, new education ideals, secular outlook, the functions of Renaissance patrons, political theory and the growth of the "early modern state," Neoplatonism, and the spread of the Renaissance from Italy to Northern Europe. (Maximum number of credits is 12; 4 credits each for three courses with different topics.) Also offered for graduate-level credit as Hst 555. Recommended prerequisite: upper division standing.
Hst 456 - Religious Change in Sixteenth Century Europe (4)

Examines the causes, characteristics, and consequences of the revolutionary changes in European Christianity that occurred during the 16th century: changes that are generally labeled "The Reformation." Also offered for graduate-level credit as Hst 556 and may be taken only once for credit. Recommended prerequisite: upper division standing.

Hst 457 - Topics in Early Modern Europe (4)

Examines selected topics in the social, cultural, political and/or economic history of Europe in the early modern period (roughly 1515-1815). Topics will vary, but may include European financial history, the crisis of the seventeenth century, popular revolt, the royal state, and other topics. May be taken a second time for credit (maximum 8 credits) with a different topic. Also offered for graduate-level credit as Hst 557. Recommended prerequisite: upper division standing.

Hst 458 - Modern Germany (4)

Examines aspects of the development of German political, social, and cultural life during the 19th and 20th centuries. Also offered for graduate-level credit as Hst 558 and may be taken only once for credit. Recommended prerequisites: Hst Hst 103, Hst 358. For Hst 558: graduate standing.

Hst 459 - Topics in Modern European History (4)

Examines a selected theme related to the history of modern Europe from (primarily) the 19th through the 20th centuries. Topics will vary, whether focusing internationally or on a single European nation, but will include the definition of Europe; dictatorship and sovereignty; nationalism and identity; society and the state; the experience of modern violence; trials and justice; world wars; comparative fascism; social and political transition, and war and society. Also offered for graduate-level credit as Hst 559. Recommended: Hst 103 or 358; upper division standing for 459; graduate standing for 559. May be taken a second time for credit (maximum 8 credits) with a different topic.

Hst 460 - Topics in European Intellectual History (4)

Examines a selected theme in the development of European thought in its social context; format includes lecture and the analysis and discussion of primary texts. May be taken a second time for credit (maximum 8 credits) with a different topic. Also offered for graduate-level credit as Hst 560 and may be taken only once for credit. Recommended prerequisites: upper division standing for 460, graduate standing for 560.

Hst 461 - Topics in Jewish History (4)

Examines select aspects of Jewish history, focusing on one or more specific regions, periods, events, or concerns. Possible topics include: medieval and early modern Jewish history, ancient Israelite or rabbinic history and culture, Sephardic Jewry, history of Russian Jewry, and gender and Jewish history. Maximum number of credits is 12; 4 credits each for three courses with different topics. Also offered for graduate-level credit as Hst 561. Expected preparation: upper division standing.

Hst 464 - Indians of the Pacific Northwest (4)

Explores the history of peoples native to the Pacific Northwest with a special emphasis on natural resource allocation and the relationships between federal, state, and tribal governments in the 19th and 20th centuries. Also offered for graduate-level credit as Hst 564 and may be taken only once for credit. Recommended prerequisite: Hst 201, 202 or Hst 338U.

Hst 465 - Twentieth Century Latin America (4)

Recent political, social, and economic developments with emphasis on the period since World War II. Also offered for graduate-level credit as Hst 565 and may be taken only once for credit. Recommended prerequisite: Hst 365, 366, or Sophomore Inquiry (Latin America).

Hst 468 - History of Mexico (4)

Hst 468/568: A study of Mexico's history from the revolutions for independence until 1876. Emphasis will be placed upon the development of constitutional government, the era of reform, foreign interventions, and the restoration of the republic. This is the second course in a sequence of three: Hst 468 Hst 469, and Hst 470. Also offered for graduate-level credit as Hst 569 and may be taken only once for credit. Recommended prerequisite: Hst 365 or 366.

Hst 470 - History of Mexico (4)

Hst 470/570: Mexico's emergence as a modern nation during the Porfirian dictatorship. The 20th century revolutionary upheaval and consolidation. This is the third course in a sequence of three: Hst 468 Hst 469, and Hst 470. Also offered for graduate-level credit as Hst 570 and may be taken only once for credit. Recommended prerequisite: Hst 365 or 366.

Hst 475 - Topics in Early Russian History (4)

Analysis of primary sources and historiographical debates on selected topics from Kievan Rus' to Muscovite Russia (800s-1600s). Also offered for graduate-level credit as Hst 575. Expected preparation: Hst 375, 376, or 377.

Hst 476 - Topics in Imperial Russian History (4)

Analysis of primary sources and historiographical debates regarding selected themes on social, political and cultural change in Russia's long 19th century. Maximum number of credits is 12; 4 credits each for three courses with different topics. Also offered for graduate-level credit as Hst 576.


Hst 477 - Topics in Soviet History (4)

Studies selected themes on the political, social, and cultural aspects of the Soviet experiment in Russia. Investigates the politics of socialism and controversies over socialist construction through primary sources and historiographical debates. Maximum number of credits is 12; 4 credits each for three courses with different topics. Also offered for graduate-level credit as Hst 577.

**Hst 478** - Russian Cultural and Intellectual History (4)

Analysis of primary sources. Hst 478/578: 19th century intelligentsia. This is the first course in a sequence of two: Hst 478 and Hst 479. Also offered for graduate-level credit as Hst 578 and may be taken only once for credit. Recommended prerequisite: upper division standing.

**Hst 479** - Russian Cultural and Intellectual History (4)

Analysis of primary sources. Hst 479/579: 20th century mass culture—films, novels, sport, and music. This is the second course in a sequence of two: Hst 478 and Hst 479. Also offered for graduate-level credit as Hst 479 and may be taken only once for credit. Recommended prerequisite: upper division standing.

**Hst 481** - Topics in Middle Eastern History (4)

Explores such transnational topics in the history of the Middle East as Islam and modernity, the Middle East and the world economy, the Middle East and orientalism. Maximum number of credits is 12; 4 credits each for three courses with different topics. Also offered for graduate-level credit as Hst 581. Expected preparation: upper-division standing.

**Hst 485** - Ottoman World (4)

An overview of Balkan and Middle Eastern history from late-medieval to early modern times (c. 14th-18th centuries). Major themes include the rise of the Ottoman Empire, the Ottomans and the early modern world (c. 1500-1800), evolution of the Ottoman state, law and religion, economy and society, and popular culture and lifestyle. Also offered for graduate-level credit as Hst 585 and may be taken only once for credit. Expected preparation: upper-division standing.

**Hst 486** - Modern Turkey (4)

A study of the formation and evolution of the Turkish Republic. Coverage runs from the late-Ottoman legacy (19th century) to an overview of the republican period (since 1923). Discussion of authoritarianism and democratization, religion and secularism, nationalism and minorities, migration and urbanization, and relations with Europe and America. Also offered for graduate-level credit as Hst 586 and may be taken only once for credit. Expected preparation: upper-division standing.

**Hst 487** - Palestine and Israel (4)

A critical review of the 19th and 20th century social, cultural, economic and political factors behind the formation of two modern Middle Eastern nations, Palestine and Israel. Also offered for graduate-level credit as Hst 587 and may be taken only once for credit. Recommended prerequisite: upper division standing.

**Hst 488** - Modern Arabia (4)

A survey of the history of the Arabian Peninsula in the 19th and 20th centuries. Emphasis will be on socio-economic and governmental institutional change with discussion of changing cultural values. The role of the British and Ottoman empires, Islamic reformism, oil, and the emergence of nation states (Saudi Arabia, Yemen, Oman, and the Gulf States). Also offered for graduate-level credit as Hst 588 and may be taken only once for credit. Recommended prerequisite: upper division standing.

**Hst 491** - Reading Seminar (4)

Provides students with an overview of the scholarship in a specific historical field. The course requires students to read, review, and discuss the significant books and articles in the field. This course is the prerequisite for Hst 492 Research Seminar. Also offered for graduate-level credit as Hst 591.

**Hst 492** - Research Seminar (4)

Students will produce a research paper on a specific historical topic. Also offered for graduate-level credit as Hst 592.

**Hst 495** - Comparative World History (4)

Comparative examination of important themes in world history. Both the themes and regional focus vary each term, and themes may be drawn from any time period. Maximum number of credits is 12; 4 credits each for three courses with different topics. Graduate credit requires a substantial research paper. Also offered for graduate-level credit as Hst 595. Recommended prerequisite: upper division standing.

**Hst 496** - Introduction to Public History (4)

An introduction to the field of public history with special emphasis on the research methods, procedures, and work in the practice of public history, from archival management to historic preservation and museum studies. Taught in cooperation with the professional staff of the Oregon Historical Society. Also offered for graduate-level credit as Hst 596 and may be taken only once for credit. This course is a prerequisite for Hst 404/504, Public History Internships.

**Hst 497** - Film and History (4)

The study of selected topics of modern history through the viewing and analysis of important documentaries and feature films. Emphasis is on the application of techniques of historical source criticism to the varied information preserved and transmitted in cinematographic form. The subject matter will vary from term to term. (Maximum number of credits is 12; 4 credits each for three courses with different topics.) Also offered for graduate-level credit as Hst 597. Recommended prerequisite: upper division standing.

**Hst 500** - Introduction to the Master’s Program in History (4)

An introduction to the professional study of history and to the writing of the master’s thesis. Intended for new or recently entering graduate students in history.

**Hst 501** - Research (0-9)

See department for course description. (Credit to be arranged.) Consent of instructor.

**Hst 503** - Thesis (0-9)

See department for course description. (Credit to be arranged.)

**Hst 504** - Public History Internship (1-12)

Intensive, on-the-job internships with public agencies, private businesses, non-profit firms, and other groups in public history work. Each internship is by special arrangement and terms. Also offered for undergraduate-level credit as Hst 404. Recommended prerequisite: Hst 496/596, or consent of instructor.

**Hst 505** - Reading and Conference (0-8)

(Credit to be arranged.)
Hst 507 - Seminar (1-6)
Study and application of the techniques of historical research and writing. Also offered for undergraduate-level credit as Hst 407.
Prerequisite: Hst 300 and Hst 405 or consent of the instructor.

Hst 509 - Public History Seminar (0-9)
Engages students in advanced investigation of special topics in public history work, including archives, oral history, project design, history on the Web, and others. Seminars will feature technical readings, group work, peer evaluation, and written projects. Required for graduate students taking the public history track option. Also offered for undergraduate-level credit as Hst 409. (Credit to be arranged.)

Hst 510 - Selected Topics (1-6)
See department for course description. (Credit to be arranged)

Hst 511 - Public History Lab (4)
Lab course will focus on a specific sub-field in Public History. Working professionals will instruct students in the latest techniques used in public history work. One lab course is required for graduate students taking the public history track in the M.A. in history. Also offered for undergraduate-level credit as Hst 411.
Prerequisite: Hst 496/596.

Hst 512 - Topics in African History and Culture (4)
An in-depth exploration of selected topics in African cultural history. Special attention will be given to thematic issues of broad application to the understanding of cultural interaction, continuity, and change. The subject matter will vary from term to term. (Maximum number of credits is 12; 4 credits each for three courses with different topics.) This course is the same as Bst 450/550. Also offered for undergraduate-level credit as Hst 412.
Prerequisite: upper-division standing.

Hst 513 - Topics in Transnationalism (4)
Examines human activities, institutional structures, and social movements that cross national boundaries. Topics include migration, diaspora, and activism, as well as flow of ideas, goods, and technologies among people or regions not defined primarily by the nation-state. Frameworks for study include border zones, deterritorialized nations or peoples, and global citizenship. Also offered for undergraduate-level credit as Hst 413.

Hst 514 - Graduate Research Colloquium (1)
Provides an opportunity for graduate students in history to engage in presentation and discussion of each other's work under faculty guidance and to gain exposure to current developments in historical scholarship through presentations of faculty research. May be repeated for credit; however, only a maximum of three credits may be applied to graduate degree requirements. Recommended prerequisites: matriculation in graduate program in History.

Hst 515 - Topics in Greek History (4)
An advanced look at specific topics in Greek history from the Bronze Age to the death of Cleopatra. Topics will include social, political, economic, intellectual, and religious history. The subject matter will vary from term to term. (Maximum number of credits is 12; 4 credits each for three courses with different topics.) Also offered for undergraduate-level credit as Hst 415.

Hst 516 - Topics in Roman History (4)
An advanced look at specific topics in Roman history from the Etruscans to the Dark Ages. Topics will include social, political, economic, and intellectual history. The subject matter will vary from term to term. (Maximum number of credits is 12; 4 credits each for three courses with different topics.) Also offered for undergraduate-level credit as Hst 416.

Hst 520 - Topics in Early Modern Japanese History (4)
Selected themes in Tokugawa (1600-1850) history, including rural life and urbanization, merchants and commerce, political thought and institutions, women and family life, neo-Confucianism, religious beliefs and practices, popular culture, arts, and literature. (Maximum number of credits is 12; 4 credits each for three courses with different topics.) Also offered for undergraduate-level credit as Hst 420.

Hst 521 - Topics in Modern Japanese History (4)
Selected themes in modern Japanese history, including the construction of the nation-state, modernization, Japan's drive to great power status, Japan's emergence as an imperialist power, state-society relations, and modernity outside Europe. (Maximum number of credits is 12; 4 credits each for three courses with different topics.) Also offered for undergraduate-level credit as Hst 421.

Hst 522 - Topics in Postwar Japanese History, 1945-present (4)
Selected themes in postwar Japanese history, including the Occupation reforms (1945-52) and Japan's place in the Cold War system, the so-called "economic miracle," the development of a mass consumer culture, and U.S.-Japan relations. (Maximum number of credits is 12; 4 credits each for three courses with different topics.) Also offered for undergraduate-level credit as Hst 422.

Hst 523 - Topics in Chinese Social History (4)
This course will examine institutions and themes-relating to the family, urban and rural life, education and the like-in Chinese social history. The subject matter will vary from term to term. (Maximum number of credits is 12; 4 credits each for three courses with different topics.) Also offered for undergraduate-level credit as Hst 423.

Hst 524 - Topics in Chinese Thought and Religion (4)
Study of selected topics in intellectual and cultural history related to Confucianism, Buddhism, Daoism, and other philosophical and religious constructs. The subject matter will vary from term to term. (Maximum number of credits is 12; 4 credits each for three courses with different topics.) Also offered for undergraduate-level credit as Hst 424.

Hst 525 - Modern China (4)
History of China from decline of imperial system through century of revolution that culminated in founding of People's Republic of China in 1949. Post-1949 focus on critical periods and issues in state-society relations, economic and political reform, and cultural changes, including global posture and relations with the West. Also offered for undergraduate-level credit as Hst 425.
Hst 527 - Topics in the History of Science (4)
An in-depth investigation of a selected theme in the history of science and its cultural, social, or political relations. The subject matter will vary from term to term; topics include: science and religion, science under Nazism, science and Modernism, Darwinism and social Darwinism, Scientific Revolution, and changing physical world pictures. Some previous study in history is recommended; a background in science is welcome, but not required or expected. (Maximum number of credits is 12; 4 credits each for three courses with different topics.) Also offered for undergraduate-level credit as Hst 427. Recommended prerequisite: upper division standing.

Hst 529 - Topics in U.S. Cultural History (4)
A lecture course that explores selected topics in modern U.S. political culture and cultural expression. Maximum number of credits is 12; 4 credits each for three courses with different topics. Also offered for undergraduate-level credit as Hst 429. Expected preparation: upper-division standing.

Hst 530 - Roots of American Culture (4)
Relation of cultural attitudes and values to the American historical experience from 1600-1860. Topics include the European legacy; Puritanism; race, class, and ethnicity; American Enlightenment and Revolution; Cultural Nationalism; Industrial Ethic and Pastoralism; Jacksonian Democracy; Manifest Destiny and Native Americans; Slavery and African American Culture; Evangelicalism, Reform, Abolitionism, and Feminism. Also offered for undergraduate-level credit as Hst 430 and may be taken only once for credit.

Hst 531 - Rise of American Corporate Culture (4)
Relation of cultural attitudes and values to the American historical experience from 1860-1945. Topics include Civil War and Reconstruction; Incorporation, Labor Reform, and Utopian Thought; Populism; Progressive Reform; Two Cultures of the 1920s; Depression Realism and Radicalism; World War II and the Judeo-Christian Consensus. Also offered for undergraduate-level credit as Hst 431 and may be taken only once for credit.

Hst 532 - Recent U.S. Political Culture (4)
Relation of cultural attitudes and values to the American historical experience from 1945 to the present. Topics include Anti-Communist, Nationalist, and Anticorporate Insurgency in the 1950s; Antiwar, Racial, Counterculture, and Feminist Ferment in the Protest Era; New Age and Postmodernist Thought; Populist Conservatism and Traditional Values, 1980-present. Also offered for undergraduate-level credit as Hst 432 and may be taken only once for credit.

Hst 533 - American Social and Intellectual History, 1600-1865 (4)
Examines early history of American social and intellectual history, including issues of race, class, religion and philosophy, ideology and politics, community, region, and labor. Also offered for undergraduate-level credit as Hst 433 and may be taken only once for credit.

Hst 534 - U.S. Social and Intellectual History, 1865-present (4)
Examines social and intellectual history of the United States from 1865 to the present. Includes discussion of race, class, religion and philosophy, ideology and politics, community, region, and labor. Also offered for undergraduate-level credit as Hst 434 and may be taken only once for credit.

Hst 535 - American Economic History: the First Century (4)
The economic background of the War of Independence and the seeds of the Civil War. Industrialization, urbanization, and development of the frontier. Rise of big business and organized labor. Laissez faire, federalism, and the gradual emergence of the national government in economic policy. Changes in foreign trade and in the international position of the U.S. Also offered for undergraduate-level credit as Hst 435 and may be taken only once for credit.

Hst 536 - American Economic History: the 20th Century (4)

Hst 540 - American Environmental History (4)
A survey of North American history that explores the relationships between ideas of nature, transformations of the environment, and the effect of the environment on humans. Topics include colonialism; links between ecological change and race, class, and gender relations; the role of science/technology; agriculture, industrialization, and urbanization; and environmentalism. Also offered for undergraduate-level credit as Hst 440 and may be taken only once for credit.

Hst 542 - Race, Class and Gender in the American West (4)
Examines the trans-Mississippi West as a cultural meeting ground and explores the racial, class, and gender implications of new migrations to the region. Particular attention will be placed on the arid West and human responses to landscape. Also offered for undergraduate-level credit as Hst 442 and may be taken only once for credit.

Hst 543 - The American West: A Political and Economic History (4)
Focuses on the major political and economic changes in the trans-Mississippi West, from the 17th century to the late 20th century, with special attention to the increasing power and influence of the federal government and corporate institutions after 1870. Recommended prerequisite: upper division standing.

Hst 544 - History of the Pacific Northwest (4)
The social, cultural, economic, and political aspects of the development of civilization in Oregon and Washington. The history of the region is related to national and international contexts. Also offered for undergraduate-level credit as Hst 444 and may be taken only once for credit.

Recommended prerequisite: Hst 201, 202.
Hst 545 - History of Portland (4)
The historical growth of Portland and its metropolitan region, with major attention given to the 20th century. Emphasis is placed upon the process of urbanization and the consequences of the past decisions and actions as they relate to recent developments. Also offered for undergraduate-level credit as Hst 445 and may be taken only once for credit. Recommended prerequisite: upper division standing.

Hst 546 - Civil Rights and the Law: The History of Equal Protection (4)
An exploration of the history of the 14th Amendment Equal Protection Clause’s impact on the civil rights of Women, African Americans, Mexican Americans, and others.
Prerequisite: upper-division standing.

Hst 547 - U.S Constitutional History: Foundations (4)
Examines the intellectual origins, creation, and ratification of the American Constitution and the early efforts of the U.S. Supreme Court to construe that document. Also offered for undergraduate-level credit as Hst 447 and may be taken only once for credit.

Hst 548 - U.S. Constitution: Nineteenth Century (4)
Examines the U.S. Supreme Court’s role in the construction of modern America; includes discussion of the Court’s decisions on federalism, slavery, presidential war powers, Reconstruction and civil rights, and industrialization. Also offered for undergraduate-level credit as Hst 448 and may be taken only once for credit.

Hst 549 - U.S. Constitution: Twentieth Century (4)
Examines how the U. S. Supreme Court’s decisions in the twentieth century impacted the national economy, federalism, and the civil rights and civil liberties of American citizens. Also offered for undergraduate-level credit as Hst 449 and may be taken only once for credit.

Hst 550 - Medieval England (4)
Examines political, religious, social, and economic aspects of the history of England from approximately 800 to the end of the 14th century. Also offered for undergraduate-level credit as Hst 450 and may be taken only once for credit. Recommended prerequisite: upper division standing or permission of instructor.

Hst 551 - Early Modern England (4)
Examines political, religious, social, and economic aspects of the history of England from the 15th through the 17th centuries. Also offered for undergraduate-level credit as Hst 451 and may be taken only once for credit. Recommended prerequisite: upper division standing.

Hst 552 - Topics in the History of European Women (4)
Examines selected aspects of the history of European women, focusing on one or more specific regions, topics, and/or time frames. Possible topics include aspects of the history of women and religion, women and work, women accessing power, and gender and religious identity. Maximum number of credits is 12; 4 credits each for three courses with different topics. Also offered for undergraduate-level credit as Hst 452. Expected preparation: upper-division standing.

Hst 553 - The Medieval City: Communities of Conflict and Consensus (4)
Emphasizes the social and cultural history of the medieval city from ca. 300-1500. Proceeding chronologically and thematically, explores how contemporaries imagined cities and urban life; the formation of civic consciousness and identity in feudal Europe; the commercial revolution and its cultural consequences; family and domestic life; the experience of marginalized elements; the construction, regulation, and function of urban space; and the role of spectacle, ceremony, and ritual, all as means to assess how the urban community mediated conflict and sought elusive consensus. Also offered for undergraduate-level credit as Hst 453 and may be taken only once for credit. Recommended prerequisites: Hst 101, 354, or 355 or upper division standing.

Hst 554 - Topics in Medieval History (4)
Examines selected topics in the social, cultural, and/or religious history of the European Middle Ages, spanning the period from roughly 800-1450 C.E. Topics will vary, but may include the study of sanctity and society, religious dissent and reformation of the church, holy war and crusade, regional and national political histories, cross-cultural studies, and other subjects. (Maximum number of credits is 12; 4 credits each for three courses with different topics.) Also offered for undergraduate-level credit as Hst 454. Recommended prerequisites: Hst 101, 354, or 355 or upper division standing.

Hst 555 - Topics in Renaissance History (4)
Examines selected aspects of the history of the U.S Supreme Court, focusing on one or more specific regions, topics, and/or time frames. Possible topics include aspects of the history of the U.S Supreme Court and its impact on the civil rights of Women, African Americans, Mexican Americans, and others.
Prerequisite: upper-division standing.

Hst 556 - Religious Change in Sixteenth Century Europe (4)
Examines the causes, characteristics, and consequences of the revolutionary changes in European Christianity that occurred during the 16th century: changes that are generally labeled "The Reformation." Recommended prerequisite: upper division standing.

Hst 557 - Topics in Early Modern Europe (4)
Examines selected topics in the social, cultural, political and/or economic history of Europe in the early modern period (roughly 1515-1815). Topics will vary, but may include European financial history, the crisis of the seventeenth century, popular revolt, the royal state, and other topics. May be taken a second time for credit (maximum 8 credits) with a different topic. Also offered for undergraduate-level credit as Hst 457. Recommended: upper division standing.

Hst 558 - Modern Germany (4)
Examines aspects of the development of German political, social, and cultural life during the 19th and 20th centuries. Also offered for undergraduate-level credit as Hst 458 and may be taken only once for credit. Recommended prerequisites: Hst Hst 103, Hst 358. For Hst 558: graduate standing.
Hst 559 - Topics in Modern European History (4)
Examine a selected theme related to the history of modern Europe from (primarily) the 19th through the 20th centuries. Topics will vary, whether focusing internationally or on a single European nation, but will include the definition of Europe; dictatorship and sovereignty; nationalism and identity; society and the state; the experience of modern violence; trials and justice; world wars; comparative fascism; social and political transition, and war and society. Also offered for undergraduate-level credit as Hst 459. Recommended: Hst 103 or 358; upper division standing for 459; graduate standing for 559. May be taken a second time for credit (maximum 8 credits) with a different topic.

Hst 560 - Topics in European Intellectual History (4)
Examine a selected theme in the development of European thought in its social context; format includes lecture and the analysis and discussion of primary texts. May be taken a second time for credit (maximum 8 credits) with a different topic. Also offered for undergraduate-level credit as Hst 460 and may be taken only once for credit. Recommended prerequisites: upper division standing for 460, graduate standing for 560.

Hst 561 - Topics in Jewish History (4)
Examine select aspects of Jewish history, focusing on one or more specific regions, periods, events, or concerns. Possible topics include: medieval and early modern Jewish history, ancient Israelite or rabbinic history and culture, Sephardic Jewry, history of Russian Jewry, and gender and Jewish history. Maximum number of credits is 12; 4 credits each for three courses with different topics. Also offered for undergraduate-level credit as Hst 461. Expected preparation: upper division standing.

Hst 564 - Indians of the Pacific Northwest (4)
Explores the history of the peoples native to the Pacific Northwest with a special emphasis on natural resource allocation and the relationships between federal, state, and tribal governments in the 19th and 20th centuries. Also offered for undergraduate-level credit as Hst 464 and may be taken only once for credit. Recommended prerequisite: Hst 201, 202 or Hst 338U.

Hst 565 - Twentieth Century Latin America (4)
Recent political, social, and economic developments with emphasis on the period since World War II. Also offered for undergraduate-level credit as Hst 465 and may be taken only once for credit. Recommended prerequisite: Hst 365, 366, or Sophomore Inquiry (Latin America).

Hst 568 - History of Mexico (4)
Hst 468/568: A study of Mexico's beginnings from pre-Columbian times through the colonial period. The origins of Mexican culture, society, economy, and political institutions will be examined in the context of Hispanic and indigenous contributions. This is the first course in a sequence of three: Hst 568 Hst 569, and Hst 570. Also offered for undergraduate-level credit as Hst 468 and may be taken only once for credit. Recommended prerequisite: Hst 365 or 366.

Hst 569 - History of Mexico (4)
Hst 469/569: A study of Mexico's history from the revolutions for independence until 1876. Emphasis will be placed upon the development of constitutional government, the era of reform, foreign interventions, and the restoration of the republic. This is the second course in a sequence of three: Hst 568 Hst 569, and Hst 570. Also offered for undergraduate-level credit as Hst 469 and may be taken only once for credit. Recommended prerequisite: Hst 365 or 366.

Hst 570 - History of Mexico (4)
Hst 470/570: Mexico's emergence as a modern nation during the Porfian dictatorship. The 20th century revolutionary upheaval and consolidation. This is the third course in a sequence of three: Hst 568 Hst 569, and Hst 570. Also offered for undergraduate-level credit as Hst 470 and may be taken only once for credit. Recommended prerequisite: Hst 365 or 366.

Hst 575 - Topics in Early Russian History (4)
Analysis of primary sources and historiographical debates on selected topics from Kievan Rus’ to Muscovite Russia (800s-1600s). Also offered for undergraduate-level credit as Hst 475. Expected preparation: Hst 375, 376, or 377.

Hst 576 - Topics in Imperial Russian History (4)
Analysis of primary sources and historiographical debates regarding selected themes on social, political and cultural change in Russia’s long 19th century. Maximum number of credits is 12; 4 credits each for three courses with different topics. Also offered for undergraduate-level credit as Hst 476. Prerequisite: Hst 376. Expected preparation: Hst 377.

Hst 577 - Topics in Soviet History (4)
Studies selected themes on the political, social, and cultural aspects of the Soviet experiment in Russia. Investigates the politics of socialism and controversies over socialist construction through primary sources and historiographical debates. Maximum number of credits is 12; 4 credits each for three courses with different topics. Also offered for undergraduate-level credit as Hst 477. Prerequisite: Hst 377. Expected preparation: Hst 376.

Hst 578 - Russian Cultural and Intellectual History (4)
Analysis of primary sources. Hst 478/578: 19th century intelligentsia. This is the first course in a sequence of two: Hst 578 and Hst 579. Also offered for undergraduate-level credit as Hst 478 and may be taken only once for credit. Recommended prerequisite: upper division standing.

Hst 579 - Russian Cultural and Intellectual History (4)
Analysis of primary sources. Hst 479/579: 20th century mass culture-films, novels, sport, and music. This is the second course in a sequence of two: Hst 578 and Hst 579. Also offered for undergraduate-level credit as Hst 479 and may be taken only once for credit. Recommended prerequisite: upper division standing.

Hst 584 - Topics in Middle Eastern History (4)
Explores such transnational topics in the history of the Middle East as Islam and modernity, the Middle East and the world economy, the Middle East and orientalism. Maximum number of credits is 12; 4 credits each for three courses with different topics. Also offered for undergraduate-level credit...
as Hst 484. Expected preparation: upper-
division standing.

**Hst 585 - Ottoman World (4)**

An overview of Balkan and Middle Eastern history from late-medieval to early modern times (c. 14th-18th centuries). Major themes include the rise of the Ottoman Empire, the Ottomans and the early modern world (c. 1500-1800), evolution of the Ottoman state, law and religion, economy and society, and popular culture and lifestyle. Also offered for undergraduate-level credit as Hst 485 and may be taken only once for credit. Expected preparation: upper-division standing.

**Hst 586 - Modern Turkey (4)**

A study of the formation and evolution of the Turkish Republic. Coverage runs from the late-Ottoman legacy (19th century) to an overview of the republican period (since 1923). Discussion of authoritarianism and democratization, religion and secularism, nationalism and minorities, migration and urbanization, and relations with Europe and America. Also offered for undergraduate-level credit as Hst 486 and may be taken only once for credit. Expected preparation: upper-division standing.

**Hst 587 - Palestine and Israel (4)**

A critical review of the 19th and 20th century social, cultural, economic and political factors behind the formation of two modern Middle Eastern nations, Palestine and Israel. Also offered for undergraduate-level credit as Hst 487 and may be taken only once for credit. Recommended prerequisite: upper division standing.

**Hst 588 - Modern Arabia (4)**

A survey of the history of the Arabian Peninsula in the 19th and 20th centuries. Emphasis will be on socio-economic and governmental institutional change with discussion of changing cultural values. The role of the British and Ottoman empires, Islamic reformism, oil, and the emergence of nation states (Saudi Arabia, Yemen, Oman, and the Gulf States). Also offered for undergraduate-level credit as Hst 488 and may be taken only once for credit. Recommended prerequisite: upper division standing.

**Hst 591 - Reading Seminar (4)**

Provides students with an overview of the scholarship in a specific historical field. The course requires students to read, review, and discuss the significant books and articles in the field. This course is the prerequisite for Hst 592 Research Seminar. Also offered for undergraduate-level credit as Hst 491.

**Hst 592 - Research Seminar (4)**

Students will produce a research paper on a specific historical topic. Also offered for undergraduate-level credit as Hst 492.

**Hst 595 - Comparative World History (4)**

Comparative examination of important themes in world history. Both the themes and regional focus vary each term, and themes may be drawn from any time period. Maximum number of credits is 12: 4 credits each for three courses with different topics. Graduate credit requires a substantial research paper. Also offered for undergraduate-level credit as Hst 495. Recommended prerequisite: upper division standing.

**Hst 596 - Introduction to Public History (4)**

An introduction to the field of public history with special emphasis on the research methods, procedures, and work in the practice of public history, from archival management to historic preservation and museum studies. Taught in cooperation with the professional staff of the Oregon Historical Society. Also offered for undergraduate-level credit as Hst 496 and may be taken only once for credit. This course is a prerequisite for Hst 404/504, Public History Internships.

**Hst 597 - Film and History (4)**

The study of selected topics of modern history through the viewing and analysis of important documentaries and feature films. Emphasis is on the application of techniques of historical source criticism to the varied information preserved and transmitted in cinematographic form. The subject matter will vary from term to term. (Maximum number of credits is 12; 4 credits each for three courses with different topics.) Also offered for undergraduate-level credit as Hst 497. Recommended prerequisite: upper division standing.

**Hum 199 - Special Studies (1-4)**

(Credit to be arranged.)

**Hum 299 - Special Studies (1-4)**

(Credit to be arranged.)

**Hum 399 - Special Studies (1-6)**

(Credit to be arranged.)

**Hum 405 - Reading and Conference (1-6)**

(Credit to be arranged.)

**Hum 407 - Seminar (1-6)**

(Credit to be arranged.)

**Hum 410 - Selected Topics (1-6)**

(Credit to be arranged.)

**Intl 195 - Colloquium (1)**

Lectures by PSU and visiting scholars on major world issues.

**Intl 199 - Special Studies (1-9)**

(Credit to be arranged.)

**Intl 201 - Introduction to International Studies (4)**

A survey of the main concepts, analytical tools, fields of study, global problems, and cross-cultural perspectives that comprise international studies.

**Intl 205 - Introduction to Regional Studies (4)**

In-depth interdisciplinary or topical study of one of the regional foci in the International Studies degree program: Africa, East Asia, Europe, Latin America, the Middle East. The aim of the course is to introduce students to the study of diverse cultures and societies in Asia through a variety of disciplinary approaches including history, literature, anthropology, the arts, and geography. Students will focus first on the origins of Asia's major cultural traditions, and then on the way in which these traditions have transformed and been transformed by the powerful forces of imperialism, industrialization, and globalization. Through written assignments and oral presentations, students will develop their critical, analytical, and communication skills.
Intl 211A - Introduction to African Studies (4)
In-depth interdisciplinary or topical study of one of the regional foci in the International Studies degree program.
Corequisite: Intl 211B.

Intl 211B - Mentored Inquiry (0)
This course is a co-requisite for Intl 211. Assignments from the main inquiry sessions are developed and discussed in mentored inquiry sessions, which are facilitated by a Graduate Mentor who is a PSU graduate student.
Corequisite: Intl 211A.

Intl 211C - Introduction to African Studies (4)
In-depth interdisciplinary or topical study of one of the regional foci in the International Studies degree program.
Corequisite: Intl 211D.

Intl 211D - Mentored Inquiry (0)
Assignments from the main inquiry sessions are developed and discussed in mentored inquiry sessions, which are facilitated by a Graduate Mentor who is a PSU graduate student.
Corequisite: Intl 211C.

Intl 211E - Introduction to African Studies (4)
In-depth interdisciplinary or topical study of one of the regional foci in the International Studies degree program.
Corequisite: Intl 211F.

Intl 211F - Mentored Inquiry (0)
Assignments from the main inquiry sessions are developed and discussed in mentored inquiry sessions, which are facilitated by a Graduate Mentor who is a PSU graduate student.
Corequisite: Intl 211E.

Intl 211G - Introduction to African Studies (4)
In-depth interdisciplinary or topical study of one of the regional foci in the International Studies degree program.
Corequisite: Intl 211H.

Intl 211H - Mentored Inquiry
Assignments from the main inquiry sessions are developed and discussed in mentored inquiry sessions, which are facilitated by a Graduate Mentor who is a PSU graduate student.
Corequisite: Intl 211G.

Intl 216A - Introduction to Asian Studies (4)
In-depth interdisciplinary or topical study of one of the regional foci in the International Studies degree program.
Corequisite: Intl 216B.

Intl 216B - Mentored Inquiry (0)
Assignments from the main inquiry sessions are developed and discussed in mentored inquiry sessions, which are facilitated by a Graduate Mentor who is a PSU graduate student.
Corequisite: Intl 216A.

Intl 216C - Introduction to Asian Studies (4)
In-depth interdisciplinary or topical study of one of the regional foci in the International Studies degree program.
Corequisite: Intl 216D.

Intl 216D - Mentored Inquiry (0)
Assignments from the main inquiry sessions are developed and discussed in mentored inquiry sessions, which are facilitated by a Graduate Mentor who is a PSU graduate student.
Corequisite: Intl 216C.

Intl 216E - Introduction to Asian Studies (4)
In-depth interdisciplinary or topical study of one of the regional foci in the International Studies degree program.
Corequisite: Intl 216F.

Intl 216F - Mentored Inquiry (0)
Assignments from the main inquiry sessions are developed and discussed in mentored inquiry sessions, which are facilitated by a Graduate Mentor who is a PSU graduate student.
Corequisite: Intl 216E.

Intl 216G - Introduction to Asian Studies (4)
In-depth interdisciplinary or topical study of one of the regional foci in the International Studies degree program.
Corequisite: Intl 216H.

Intl 216H - Mentored Inquiry
Assignments from the main inquiry sessions are developed and discussed in mentored inquiry sessions, which are facilitated by a Graduate Mentor who is a PSU graduate student.
Corequisite: Intl 216G.

Intl 226A - Introduction to European Studies (4)
In-depth interdisciplinary or topical study of one of the regional foci in the International Studies degree program.
Corequisite: Intl 226B.

Intl 226B - Mentored Inquiry (0)
Assignments from the main inquiry sessions are developed and discussed in mentored inquiry sessions, which are facilitated by a Graduate Mentor who is a PSU graduate student.
Corequisite: Intl 226A.

Intl 226C - Introduction to European Studies (4)
In-depth interdisciplinary or topical study of one of the regional foci in the International Studies degree program.
Corequisite: Intl 226D.

Intl 226D - Mentored Inquiry (0)
Assignments from the main inquiry sessions are developed and discussed in mentored inquiry sessions, which are facilitated by a Graduate Mentor who is a PSU graduate student.
Corequisite: Intl 226C.

Intl 226E - Introduction to European Studies (4)
In-depth interdisciplinary or topical study of one of the regional foci in the International Studies degree program.
Corequisite: Intl 226F.

Intl 226F - Mentored Inquiry (0)
Assignments from the main inquiry sessions are developed and discussed in mentored inquiry sessions, which are facilitated by a Graduate Mentor who is a PSU graduate student.
Corequisite: Intl 226E.

Intl 240A - Introduction to Latin American Studies (4)
In-depth interdisciplinary or topical study of one of the regional foci in the International Studies degree program.
Corequisite: Intl 240B.

Intl 240B - Mentored Inquiry (0)
Assignments from the main inquiry sessions are developed and discussed in mentored inquiry sessions, which are facilitated by a Graduate Mentor who is a PSU graduate student.
Corequisite: Intl 240A.

Intl 240C - Introduction to Latin American Studies (4)
In-depth interdisciplinary or topical study of one of the regional foci in the International Studies degree program.
Corequisite: Intl 240D.

Intl 240D - Mentored Inquiry (0)
Assignments from the main inquiry sessions are developed and discussed in mentored inquiry sessions, which are facilitated by a Graduate Mentor who is a PSU graduate student.
Corequisite: Intl 240C.
Intl 240E - Latin American Studies (4)
Please contact the department for a description of this course.

Intl 240F - Mentored Inquiry Workshop (0)
Please contact the department for a description of this course.

Intl 247A - Introduction to Middle Eastern Studies (4)
In-depth interdisciplinary or topical study of one of the regional foci in the International Studies degree program.
Corequisite: Intl 247B.

Intl 247B - Mentored Inquiry (0)
Assignments from the main inquiry sessions are developed and discussed in mentored inquiry sessions, which are facilitated by a Graduate Mentor who is a PSU graduate student.
Corequisite: Intl 247A.

Intl 247C - Introduction to Middle Eastern Studies (4)
In-depth interdisciplinary or topical study of one of the regional foci in the International Studies degree program.
Corequisite: Intl 247D.

Intl 247D - Mentored Inquiry (0)
Assignments from the main inquiry sessions are developed and discussed in mentored inquiry sessions, which are facilitated by a Graduate Mentor who is a PSU graduate student.
Corequisite: Intl 247C.

Intl 299 - Special Studies (1-4)
(Credit to be arranged.)

Intl 317 - Topics in Asian Thought (4)
Study of the religious and ethical traditions of Asia including, but not limited to, Buddhism, Confucianism, Hinduism, and Islam, their social and cultural importance, and their ties to political thought and history.

Intl 317U - Topics in Asian Thought (4)
Study of the religious and ethical traditions of Asia including, but not limited to, Buddhism, Confucianism, Hinduism, and Islam, their social and cultural importance, and their ties to political thought and history.

Intl 321 - Globalization and Identity: Humanities (4)
Examines how U.S. and Asian societies define the meaning of globalization vis-a-vis themselves and each other using source materials from the humanities.

Intl 321U - Globalization and Identity: Humanities (4)
Examines how U.S. and Asian societies define the meaning of globalization vis-a-vis themselves and each other using source materials from the humanities.

Intl 322 - Globalization and Identity: Social Science (4)
Examines how U.S. and Asian societies define the meaning of globalization vis-a-vis themselves and each other using source materials from the social sciences.

Intl 322U - Globalization and Identity: Social Science (4)
Examines how U.S. and Asian societies define the meaning of globalization vis-a-vis themselves and each other using source materials from the social sciences.

Intl 323 - Tradition and Innovation: Humanities (4)
Examines how U.S. and Asian societies employ the meanings of "tradition" and "innovation" to define themselves and view each other. Looks at tradition and innovation in both societies through plays, film and Asian and American literature.

Intl 323U - Tradition and Innovation: Humanities (4)
Examines how U.S. and Asian societies employ the meanings of "tradition" and "innovation" to define themselves and view each other. Looks at tradition and innovation in both societies through plays, film and Asian and American literature.

Intl 324 - Tradition and Innovation: Social Science (4)
Examines how U.S. and Asian societies employ the meanings of "tradition" and "innovation" to define themselves and view each other. Looks at tradition and innovation in both societies through historical, economic, and political science perspectives.

Intl 324U - Tradition and Innovation: Social Science (4)
Examines how U.S. and Asian societies employ the meanings of "tradition" and "innovation" to define themselves and view each other. Looks at tradition and innovation in both societies through historical, economic, and political science perspectives.

Intl 331 - Women in the Middle East (4)
Aims to explore the role and status of women in the contemporary Middle East with respect to institutions such as the family, law, education, work, and politics -- areas which intersect and overlap with broader cultural questions about women and their place in tradition, modernity, nation-building, Islam, and the West. This course is the same as WS 331 and may only be taken once for credit.
Crosslisted as: WS 331.

Intl 331U - Women in the Middle East (4)
Aims to explore the role and status of women in the contemporary Middle East with respect to institutions such as the family, law, education, work, and politics -- areas which intersect and overlap with broader cultural questions about women and their place in tradition, modernity, nation-building, Islam, and the West. This course is the same as WS 331 and may only be taken once for credit.
Crosslisted as: WS 331U.

Intl 332 - Islamic Movements in the Contemporary Muslim World (4)
An overview of Islamic political movements in the contemporary Muslim world. Examines the roots and development of Islamic movements in Muslim-populated societies in the context of Social Movement Theory and globalization. Particular attention to the rise of Islamic political movements from their position as a local and regional force to a global political movement.

Intl 332U - Islamic Movements in the Contemporary Muslim World (4)
An overview of Islamic political movements in the contemporary Muslim world. Examines the roots and development of Islamic movements in Muslim-populated societies in the context of Social Movement Theory and globalization. Particular...
attention to the rise of Islamic political movements from their position as a local and regional force to a global political movement.

**Intl 341 - Environment and Development in Latin America (4)**

Examines the interrelationships between environment and development in Latin America from an interdisciplinary perspective. Explores issues of sustainable development including agriculture, deforestation, trade, urbanization, ecotourism and migration.

**Intl 341U - Environment and Development in Latin America (4)**

Examines the interrelationships between environment and development in Latin America from an interdisciplinary perspective. Explores issues of sustainable development including agriculture, deforestation, trade, urbanization, ecotourism and migration.

**Intl 342 - Globalization and Conflict in Latin America (4)**

Examines issues of globalization and its impacts on regional conflict in contemporary Latin America. Topics include political systems, trade, poverty, inequality and human rights.

**Intl 342U - Globalization and Conflict in Latin America (4)**

Examines issues of globalization and its impacts on regional conflict in contemporary Latin America. Topics include political systems, trade, poverty, inequality and human rights.

**Intl 343 - Commodity Chains in Latin America: From Silver to Cocaine (4)**

Explores the politics, economy, culture and environment of Latin America from the point of view of export commodities. Tracing commodity chains, from silver and cocaine to bananas and soy, the course shows how these chains connect places to the world economy, and the ramifications of economic dependence.

**Intl 343U - Commodity Chains in Latin America: From Silver to Cocaine (4)**

Explores the politics, economy, culture and environment of Latin America from the point of view of export commodities. Tracing commodity chains, from silver and cocaine to bananas and soy, the course shows how these chains connect places to the world economy, and the ramifications of economic dependence.

**Intl 350 - The City in Europe (4)**

Focus on modern urban life since the eighteenth century and various responses to industrialization, state power, modernity, and globalization. The city provides a lens into debates on imperialism, nationalism, and cosmopolitanism. Through case studies, literature, and film, the course explores cities' roles in shaping European identity and citizenship.

**Intl 350U - The City in Europe (4)**

Focus on modern urban life since the eighteenth century and various responses to industrialization, state power, modernity, and globalization. The city provides a lens into debates on imperialism, nationalism, and cosmopolitanism. Through case studies, literature, and film, the course explores cities' roles in shaping European identity and citizenship.

**Intl 360 - Bollywood: Communicating Contemporary South Asia through Cinema (4)**

Bollywood encompasses media industries in India and South Asia that produce entertainment for worldwide consumption. We examine transnational Indian Cinema emphasizing: Globalization and the politics of transnational film production, distribution, and reception. Local-regional-global dynamics. The construction and negotiation of gender, family, nation, religion/communalism, and emerging filmic genres. Filmic representation and diasporic identities.

**Intl 360U - Bollywood: Communicating Contemporary South Asia through Cinema (4)**

Bollywood encompasses media industries in India and South Asia that produce entertainment for worldwide consumption. We examine transnational Indian Cinema emphasizing: Globalization and the politics of transnational film production, distribution, and reception. Local-regional-global dynamics. The construction and negotiation of gender, family, nation, religion/communalism, and emerging filmic genres. Filmic representation and diasporic identities.

**Intl 362 - Amazon Rain Forest (4)**

Examines different ways in which the Amazon has been perceived through time. This course is the same as Hst 362; course may only be taken once for credit.

Crosslisted as: Hst 362.

**Intl 362U - Amazon Rain Forest (4)**

Examines different ways in which the Amazon has been perceived through time. This course is the same as Hst 362; course may only be taken once for credit.

Crosslisted as: Hst 362U.

**Intl 364 - Modern Brazil (4)**

Examines such topics as slavery, abolition, messianism, banditry, the Amazon, race, military rule, and democratization in the making of modern Brazil. This course is the same as Hst 364. May only be taken once for credit.

**Intl 364U - Modern Brazil (4)**

Examines such topics as slavery, abolition, messianism, banditry, the Amazon, race, military rule, and democratization in the making of modern Brazil. This course is the same as Hst 364. May only be taken once for credit.

**Intl 372 - Sociology of Africa: Post-colonial Studies of Africa (4)**

Study of the social, political, and economic dimensions of imperialism in twentieth century Africa from the perspective of post-colonial studies.

**Intl 372U - Sociology of Africa: Post-colonial Studies of Africa (4)**

Study of the social, political, and economic dimensions of imperialism in twentieth century Africa from the perspective of post-colonial studies.

**Intl 390 - Foundations of Global Studies (4)**

Exploration of key theories of global, social, and cultural processes including positivism, liberalism, and Marxism through multiple approaches including non-Western and comparative perspectives.

Prerequisite: Intl 201.

**Intl 395 - Colloquium (1)**

Lectures by PSU and visiting scholars on major world issues.
Intl 396 - The United States and the World (4)
Interdisciplinary study and analysis of the role of the United States in world affairs with emphasis on the twentieth and twenty-first century, relations between the U.S. and the Third World, the era of the Cold War, American globalism, diplomatic, economic, and geopolitical issues.

Intl 397 - US Policy and International Development (4)
Explores relation between U.S. domestic and foreign policy on the formulation of the concept of development, its theoretical evolution and application in developing nations. Utilizes a historical approach starting with colonialism and ending with topics of contemporary salience such as trade, financial liberalization and sustainability.

Intl 397W - Preparation for the International Experience (4)
Examination of communication-based dimensions of an international or intercultural experience, including teaching English to speakers of other languages. Development of strategies and activities required to meet the challenges of teaching, working, or doing research in an international/intercultural setting.

Prerequisite: upper-division or postbac academic standing. All linguistics students must register for Ling 471/571 which includes a zero-credit lab, however, this course is also offered as BSt 471. Course may only be taken once for credit.

Intl 399 - Special Studies (0-6)
(Credit to be arranged.)

Intl 401 - Research (1-12)
(Credit to be arranged.)

Intl 402 - Independent Study (1-8)
(Credit to be arranged.)

Intl 404 - Cooperative Education/Internship (1-12)
(Credit to be arranged.)

Intl 405 - Reading and Conference (1-12)
(Credit to be arranged.)

Intl 407 - Seminar (4)
Reading and discussion about an interdisciplinary topic in international affairs. Restricted to upper-division students with an International Studies major or minor.

Intl 407U - Seminar (4)
(Credit to be arranged.)

Intl 410 - Selected Topics (1-12)
(Credit to be arranged.)

Intl 445 - Cities and Third World Development (3)
Critical survey of historical, economic, cultural, political, and urban aspects of Third World development, starting with the colonial era. Includes historical patterns of integration of the Third World with the emerging world market system. Covers development theories and problems of the post-independence period, focusing on urban issues and policy alternatives. This is the same course as USP 445 and may be taken only once for credit.

Prerequisite: Upper-division standing. Crosslisted as: USP 445.

Intl 452 - The European Union (4)
Focuses on how the EU has evolved since its beginnings in the 1950s, on its present-day organization and functions, and on how the member countries interact in making EU policies for jointly regulating their internal economies and societies as well as how the EU members also try to manage their relations with the rest of the world. This course is the same as PS 452; course may only be taken once for credit.

Crosslisted as: PS 452.

Intl 460 - Political Development in Modern Turkey (4)
Designed to provide students with an in-depth study of political development literature with a focus on modern Turkey. Examines how a modern Turkish republic emerged from the ashes of the Ottoman Empire and evaluates stages of political development during the first, second, and third republic. Finally, assesses the implications of Turkey’s new geopolitics (post Cold War) on Turkish political and economic development from a global perspective. This course is the same as PS 460 and may only be taken once for credit.

Crosslisted as: PS 460.

Intl 461 - Politics of Economic Reform in Modern Turkey (4)
This course is designed to provide students with an in depth study of political development literature with a focus on modern Turkey. We will examine how modern Turkish republic emerged from the ashes of the Ottoman Empire and evaluate stages of economic development during the first, second, and third republic. Finally, we will assess the implications of Turkey’s new geopolitics (since the end of the Cold War) on Turkish economic development in a global perspective. Also offered for graduate-level credit as Intl 561; this course is cross-listed as PS 461/561; may only be taken once for credit.

Intl 470 - Intercultural Leadership and Change (4)
Prepares students for citizenship, leadership, scholarship, and research in a changing and globalized world. Culls perspectives from extant intercultural scholarship. Develops analytical tools to reflect upon politically created difference in race, religion, class and gender in cosmopolitan societies.

Prerequisite: Upper-division standing.

Intl 471 - Understanding the International Experience (4)
Examination of communication-based dimensions of an international or intercultural experience, including teaching English to speakers of other languages. Development of strategies and activities required to meet the challenges of teaching, working, or doing research in an international/intercultural setting.

Prerequisite: upper-division or postbac academic standing. All linguistics students must register for Ling 471/571 which includes a zero-credit lab, however, this course is also offered as BSt 471. Course may only be taken once for credit.

Intl 472 - Media and International Relations (4)
Examines the role of media (traditional and new media), historical and contemporary, in the conduct of international relations and in the reporting and representations of national and international politics and cultures.
Intl 472H -

Intl 490 - Global Sustainable Development (4)

An examination of key concepts of sustainable development, policies associated with sustainable development in developing nations, and the power relations inherent to these policies. The subject matter is approached from an interdisciplinary perspective. Recommended prerequisites: Intl 397.

Intl 499 - Senior International Experience (1-6)

A service learning and/or community-based learning experience in an international or intercultural setting, in a group-supervised, team centered format, within either a study-abroad program or a local project (or both) with an appropriate international agency, business, community, or non-profit organization.

Intl 501 - Research (1-9)

(Credit to be arranged.)

Intl 504 - Cooperative Education/Internship (1-9)

(Credit to be arranged.)

Intl 505 - Reading and Conference (1-9)

(Credit to be arranged.)

Intl 507 - Seminar (1-6)

(Credit to be arranged.)

Intl 510 - Selected Topics (1-6)

(Credit to be arranged.)

Intl 560 - Political Development in Modern Turkey (4)

Designed to provide students with an in-depth study of political development literature with a focus on modern Turkey. Examines how a modern Turkish republic emerged from the ashes of the Ottoman Empire and evaluates stages of political development during the first, second, and third republic. Finally, assesses the implications of Turkey's new geopolitics (post Cold War) on Turkish economic development in a global perspective. Also offered for undergraduate-level credit as Intl 461; this course is cross-listed as PS 461/561; may only be taken once for credit.

ISQA - Infor Systems & Quant Analysis

ISQA 111 - Fundamental Computer Concepts (2)

The fundamental concepts of Electronic Data Processing; the impact of EDP on the firm, and the fundamental concepts of computer use including programming and applications. Provides a general vocabulary and understanding of the capabilities of the computer in business. (One hour of lecture and two hours of recitation.)

ISQA 360 - Computer Programming for Business Applications (4)

Introduction to the fundamental programming theories and concepts necessary to create software applications that address the information needs of an organization. Introduces business students to the object-oriented design, implementation, and testing of event-driven programs. Topics include class definition, methods, data types, control structures, and file-based interactive input/output. Provides an overview of the industry proven software-development principles, and outlines the contribution that business professionals make to the program-development process.

Prerequisite: BA 325, CS 106.

ISQA 380 - Data Communications (4)

Topics include communication between people and machines, transmission systems, protocols for communication technologies, and digital communication and networks. Application areas reviewed include data communications, voice and electronic mail, Internet, and mobile systems. Management issues covered include cost/benefit analysis, organizational impact, international systems, and emerging technologies.

Prerequisite: BA 325, CS 106.

ISQA 399 - Special Studies (1-6)

(Credit to be arranged.)

ISQA 401 - Research (1-6)

(Credit to be arranged.)

ISQA 404 - Internship (1-6)

(Credit to be arranged.)

ISQA 405 - Reading and Conference (1-6)

(Credit to be arranged.)

Prerequisite: consent of instructor.

ISQA 407 - Seminar (1-6)

(Credit to be arranged.) Student-selected problems in information systems, quantitative analysis, or operations and materials management to be studied by the individual and discussed in group meeting under direction of academic staff.

ISQA 409 - Practicum (1-12)

(Credit to be arranged.) Field work involving the practice of professional activities away from campus.

Prerequisite: consent of instructor.

ISQA 410 - Selected Topics (1-6)

(Credit to be arranged.)

ISQA 415 - Database Management (4)

Study of data environments, the evolution of database technology, database concepts and uses, data models, database design, and query processing. Emphasis will be placed on the relational model and database management systems that support the model. Students will participate in database design projects. Other topics address emerging database trends and opportunities.

Prerequisite: BA 325, CS 106.

ISQA 418 - Client-Server Application Development (4)

Provides an introduction to client server application development with emphasis on the client. Topics include graphical user interface development, event-driven programming, and rapid application
development tools. Students will participate in the development of projects using programming languages such as Visual Basic.

Prerequisite: ISQA 360.

**ISQA 419 - Web Application Development (4)**

Introduces the development of applications in Internet environments, focusing on the design and creation of interactive Web sites that provide access to databases. Other topics will include current issues in the evolution of Web technologies, and considerations affecting requirements determination and application design in the Web context.

Prerequisite: ISQA 360.

**ISQA 420 - Systems Analysis and Design (4)**

Examines the scope and organization of the systems development process, with particular emphasis on the roles that business professionals perform in systems projects. Topics include system requirements, system specification, systems design, implementation, and project management. Standard system analysis methods and techniques will be presented and applied.

Prerequisite: ISQA 360, ISQA 380, and ISQA 415.

**ISQA 424 - LAN Management (4)**

Hands-on introduction to the administration of client/server-based local area networks addressing both conceptual and operational aspects of network operating system management and client operating system configuration. Topics include: design and implementation of network directory services and file systems; network security, backup, and recovery; the implementation and control of distributed print services; user access management and environment automation; and remote workstation management.

Prerequisite: ISQA 380.

**ISQA 426 - Introduction to Decision Technologies (4)**

Provides an introduction to the technologies used in aiding decision making in organizations. In addition to the theoretical aspects of decision support, the course exposes students to current technologies. Topics include: human decision making; database technologies for decision support; statistical, analytical, and artificial-intelligence models for decision support; data mining; and on-line analytical processing.

Prerequisite: ISQA 415.

**ISQA 428 - Principles and Practices of Information Security (4)**

An introduction to the theories, concepts, and practices relating to the deployment and management of information security systems. Topics include: threat analysis and risk management; encryption and security technology; system design, implementation, and maintenance; and the legal, ethical, and social implications of information security.

Prerequisite: ISQA 380.

**ISQA 429 - Transportation and Logistics Management (4)**

Overview of logistics including transportation, warehouse location and layout, inventory policies, distribution operations, and information systems. Also offered for graduate-level credit as ISQA 529 and may be taken only once for credit.

Prerequisite: BA 339.

**ISQA 430 - Industrial Transportation and Freight (4)**

Develops an understanding of various modes of transportation, primarily focused on business applications and the movement of freight. Operational characteristics of the modes are evaluated, freight rate derivation and analyses are understood, and organizational evaluations of transportation strategies are studied. Transportation contract forms are analyzed and transportation risks are evaluated.

Prerequisite: BA 339.

**ISQA 431 - Transportation Regulation (4)**

Differences between public and private purchasing processes. Federal purchasing procedures in managing the supply chain. Deals with developing sound policies and procedures in managing the supply chain. Topics include supplier selection and evaluation, competitive bidding, contract development and administration, value analysis, and standardization. Also offered for graduate-level credit as ISQA 539 and may be taken only once for credit.

Prerequisite: BA 339.

**ISQA 436 - Advanced Database Administration (4)**

Advanced study of data environments, data modeling techniques, database design, query processing, and optimization. Emphasis will be placed on client-server architecture and data environments such as Oracle and SQL Server. Students will participate in database design projects. Other topics will include industry trends and opportunities, and database administration.

Prerequisite: ISQA 415.

**ISQA 439 - Purchasing and Supply Chain Management (4)**

Introduction to theories and practices of governmental procurement. Major aspects of purchasing within public agencies in the United States with special emphasis on the Oregon statutes and administrative rules. Differences between public and private purchasing processes. Federal purchasing processes.

Prerequisite: BA 339.

**ISQA 440 - Governmental Procurement (4)**

Study of the principles of quality management including statistical quality control, total quality management, and the quality tools especially as they apply to supply and logistics processes.

Prerequisite: BA 339.

**ISQA 449 - Process Control and Improvement (4)**

Study of the phases and activities of projects, as well as the management tools used to create project plans, management, including the impacts of organizational strategy, structure and culture on the development and execution of projects.

Prerequisite: Upper division standing in the SBA.
ISQA 451 - Business Forecasting (4)
Focuses on the use of various forecasting tools to aid in making managerial decisions. Students will analyze data using many of the tools and assess and evaluate the validity of each. Prerequisite: BA 339.

ISQA 454 - Supply and Logistics Management (4)
Overview of logistics including transportation, warehouse location and layout, inventory policies, distribution operations, and information systems. Also offered for undergraduate-level credit as ISQA 429 and may be taken only once for credit. Prerequisite: ISQA 429, 439, and 3-4 additional credits in supply and logistics management option courses.

ISQA 501 - Research (1-8)
(Credit to be arranged.)

ISQA 504 - Cooperative Education/Internship (1-6)
(Credit to be arranged.)

ISQA 507 - Seminar (1-6)
(Credit to be arranged.)

ISQA 510 - Selected Topics (1-12)
(Credit to be arranged.)

ISQA 510S - Selected Topics (4)
(Credit to be arranged.)

ISQA 515 - Series and Forecasting Techniques (1)
Prerequisite: ISQA 513.

ISQA 516 - Introduction to Business Intelligence and Analytics (4)
An introduction to the concepts and analytic methods that are useful in understanding the management of a firm's operations and supply chain. The aim of the course is to (1) familiarize students with the basic language, concepts, insights and tools of operations and supply chain management, (2) demonstrate principles and methods for integrating sustainability into an organization using concepts such as the Toyota Production System, cradle-to-cradle principles, green procurement, and life cycle analysis, and (3) explore the relationship between sustainable supply chains and local and global economies in terms of environmental impact and social contribution.

ISQA 517 - Business Decision Tools for Managers (2)
This course builds directly from the on-line Essentials of Business Decision Tools completed prior to admission to the MBA+ program. Students will gain an in-depth understanding of the fundamental theories, concepts, and principles of quantitative analysis. Topics covered include estimation, hypothesis testing, ANOVA and regression analysis.
Prerequisite: Pre-stats online module.

ISQA 518 - Electronic Commerce (3)
Survey of technologies and technological applications to conduct business electronically today and in the future. Students will learn about electronic data interchange, the role of technology in electronic markets, the Internet, and the organizational impact of these technologies. Internet based technologies will be presented and used.

ISQA 519 - Business Forecasting (3)
Focus on business applications that incorporate Time Series and Forecasting Techniques, including multiple regression procedures. This section will build directly from coursework in Fin 513 and ISQA 513. Prerequisites: ISQA 513

ISQA 520 - Introduction to Business Intelligence and Analytics (4)
An overview on leveraging data resources to develop and deploy business strategies to enhance their decision-making capabilities so organizations can gain and sustain a competitive advantage. Specifically, the course shows how to discover subtle patterns and associations from business data and develop and deploy predictive, clustering, and market basket models to optimize decision-making throughout organization.

ISQA 521 - Analytics Communication and Management (2)
Prepares students to access, analyze, manage, and present data to an organization's decision makers. An essential skill within Business Intelligence / Analytics is the ability to effectively communicate analysis, which includes providing a recommendation to decision makers through data visualization.

ISQA 529 - Transportation and Logistics Management (4)
Overview of logistics including transportation, warehouse location and layout, inventory policies, distribution operations, and information systems. Also offered for undergraduate-level credit as ISQA 429 and may be taken only once for credit.
Prerequisite: BA 339.

ISQA 529S - Transportation and Logistics Management (4)
Overview of logistics including transportation, warehouse location and layout, inventory policies, distribution operations, and information systems.
Prerequisite: BA 339 or BA 311.

ISQA 539 - Purchasing and Supply Chain Management (4)
Deals with developing sound policies and procedures in managing the supply chain. Topics include supplier selection and evaluation, competitive bidding, contract development and administration, value analysis, and standardization. Also offered for undergraduate-level credit as ISQA 439 and may be taken only once for credit.
Prerequisite: BA 339.

ISQA 539S - Purchasing and Supply Chain Management (4)
Deals with developing sound policies and procedures in managing the supply chain. Topics include supplier selection and evaluation, competitive bidding, contract development and administration, value analysis, and standardization. Also offered for undergraduate-level credit as ISQA 439 and may be taken only once for credit.
Prerequisite: BA 339.

ISQA 559 - Production Planning and Control (4)
Intermediate and short range production planning and scheduling. Topics will include aggregate planning, materials requirement planning, scheduling and just-in-time. Also offered for undergraduate-level credit as ISQA 459 and may be taken only once for credit.
Prerequisite: BA 339.

ISQA 559S - Production Planning and Control (4)
Intermediate and short range production planning and scheduling. Topics will include aggregate planning, materials requirement planning, scheduling and just-in-time.
Prerequisite: BA 339.

IST 101 - First-year Italian (4)
An introduction to elementary Italian. Emphasis on listening comprehension and oral practice, the elements of grammar, vocabulary building, and elementary readings. This is the first course in a sequence of three: It 101, It 102, and It 103.
It 102 - First-year Italian (4)
An introduction to elementary Italian. Emphasis on listening comprehension and oral practice, the elements of grammar, vocabulary building, and elementary readings. This is the second course in a sequence of three: It 101, It 102, and It 103.
It 103 - First-year Italian (4)
An introduction to elementary Italian. Emphasis on listening comprehension and oral practice, the elements of grammar, vocabulary building, and elementary readings. This is the third course in a sequence of three: It 101, It 102, and It 103.

IST 201 - Second-year Italian (4)
Intensive review of basic materials introduced in first-year program and further development of communication skills. This is the first course in a sequence of three: It 201, It 202, and It 203. Recommended prerequisite: It 103.

IST 202 - Second-year Italian (4)
Intensive review of basic materials introduced in first-year program and further
development of communication skills. This is the second course in a sequence of three: It 201, It 202, and It 203. Recommended prerequisite: It 103.

**It 203 - Second-year Italian (4)**

Intensive review of basic materials introduced in first-year program and further development of communication skills. This is the third course in a sequence of three: It 201, It 202, and It 203. Recommended prerequisite: It 103.

**It 299 - Special Studies (1-12)**

(Credit to be arranged.)

**It 301 - Third-year Italian (4)**

Composition and conversation at the intermediate level. This is the first course in a sequence of three: It 301, It 302, and It 303. Recommended prerequisite: It 203.

**It 302 - Third-year Italian (4)**

Composition and conversation at the intermediate level. This is the second course in a sequence of three: It 301, It 302, and It 303. Recommended prerequisite: It 203.

**It 303 - Third-Year Italian (4)**

Composition and conversation at the intermediate level. This is the third course in a sequence of three: It 301, It 302, and It 303. Recommended prerequisites: It 301, 302.

**It 330 - Italian Culture and Civilization (4)**

Surveys major trends and development in Italian culture and civilization from its origins to the present. Includes historical, political, social, artistic and intellectual perspectives. Taught in English.

**It 341 - Introduction to Italian Literature (4)**

Overview of Italian literature from late 1600s to present. It 341 focuses on 1600s to 1800s. It 342 focuses on late 1800s to present. Introduction to representative authors and their influence on Italian and Western civilization. Study of major literary and cultural movements. This is the first course in a sequence of two: It 341 and It 342. Recommended prerequisite: It 203.

**It 342 - Introduction to Italian Literature (4)**

Overview of Italian literature from late 1600s to present. It 341 focuses on 1600s to 1800s. It 342 focuses on late 1800s to present. Introduction to representative authors and their influence on Italian and Western civilization. Study of major literary and cultural movements. This is the second course in a sequence of two: It 341 and It 342. Recommended prerequisite: It 203.

**It 390 - History of Italian Language (4)**

Introduction to the history of the Italian language, from late 800 AD to 1900. Introduction to the most representative documents that shaped the Italian Language and to the differences between the various Italian dialects. Focus on the importance of the work by Dante Alighieri, Francesco Petrarca and Giovanni Boccaccio, Renaissance authors and major linguistics theories of 1800. Taught in Italian. Expected preparation: It 203.

**It 399 - Special Studies (1-6)**

(Credit to be arranged.)

**ITP - Initial Teacher Preparation**

**ITP 411 - Technology as a Tool for Learning (3)**

Use of digital tools to enhance teacher productivity and professional development and for planning, instruction, and assessment of student learning. Employ technology to foster information literacy and digital citizenship. Engage diverse learners in inquiry, communication and collaboration, creation, visual design, and production of media. Also offered for graduate-level credit as ITP 513 and may be taken only once for credit.

Prerequisite: Admission into the Graduate Teacher Education Program (GTEP), Secondary Dual Endorsement Program (SDP), or the Bilingual Teacher Education Program (BTP) Program and others with instructor approval.

**ITP 412 - Learning and the Learner (1-3)**

Candidates identify themselves as learners, recognize the learning needs of their students, understand the learning theories relevant to educational practice, and identify the most useful elements of learning theories to inform their developing educational philosophy. Identify effective strategies and learning environments to maximize content and process outcomes for diverse students. Also offered for graduate-level credit as ITP 512 and may be taken only once for credit.

Prerequisite: Admission to a teacher education program.

**ITP 413 - Technology as a Tool for Learning (3)**

Use of digital tools to enhance teacher productivity and professional development and for planning, instruction, and assessment of student learning. Employ technology to foster information literacy and digital citizenship. Engage diverse learners in inquiry, communication and collaboration, creation, visual design, and production of media. Also offered for graduate-level credit as ITP 513 and may be taken only once for credit.

Prerequisite: Admission into the Secondary Graduate Teacher Education Program (GTEP), Secondary Dual Endorsement Program (SDP), or the Bilingual Teacher Education Program (BTP) Program and others with instructor approval.

**ITP 414 - Educating for Equity and Social Justice (3)**

Explore issues of identity, linguistics, race, ethnicity, sexual orientation, gender, social class, ability, and other forms of diversity. Teacher candidates gain an understanding of how culture influences educational processes, as well as their role and responsibility in creating socially just and equitable classrooms/schools, where all students and families are valued. Also offered for graduate-level credit as ITP 514 and may be taken only once for credit.
Prerequisite: Admission into the Graduate Teacher Education Program (GTEP), Secondary Dual Endorsement Program (SDEP), or the Bilingual Teacher Pathway (BTP) Program and others with instructor approval.

**ITP 421 - Secondary Art Methods (2-4)**
Issues and methods in selecting and organizing materials for instruction in middle level/high art education. Examines a variety of professional resources available to support learning. Introduces research-based instructional practices and lesson/unit planning. Situates teaching, learning, and assessment within the context of state and national standards. Also offered for graduate-level credit as ITP 521 and may be taken fall, winter, and spring terms for credit.

Prerequisite: Admission into the Secondary Graduate Teacher Education Program (GTEP), Secondary Dual Endorsement Program (SDEP), or the Bilingual Teacher Pathway (BTP) Program.

**ITP 422 - Secondary English Language Arts Methods (2-4)**
Issues and methods in selecting and organizing materials for instruction in middle level/high school language arts education. Examines a variety of professional resources available to support learning. Introduces research-based instructional practices and lesson/unit planning. Situates teaching, learning, and assessment within the context of state and national standards. Also offered for graduate-level credit as ITP 522 and may be taken fall, winter, and spring terms for credit.

Prerequisite: Admission into the Secondary Graduate Teacher Education Program (GTEP), Secondary Dual Endorsement Program (SDEP), or the Bilingual Teacher Pathway (BTP) Program.

**ITP 423 - Secondary Health and Physical Education Methods (2-4)**
Issues and methods in selecting and organizing materials for instruction in middle and high school health and K-12 physical education. Examines a variety of professional resources available to support learning. Introduces research-based instructional practices and lesson/unit planning. Situates teaching, learning, and assessment within the context of state and national standards. Also offered for graduate-level credit as ITP 523 and may be taken fall, winter, and spring terms for credit.

Prerequisite: Admission into the Master of Education degree program and admission into Teacher Education Program.

**ITP 424 - Secondary Mathematics Methods (2-4)**
Issues and methods in selecting and organizing materials for instruction in middle level and high mathematics education. Examines a variety of professional resources available to support learning. Introduces research-based instructional practices and lesson/unit planning. Situates teaching, learning, and assessment within the context of state and national standards. Also offered for graduate-level credit as ITP 524 and may be taken fall, winter, and spring terms for credit.

**ITP 425 - Secondary Music Methods (2-4)**
Issues and methods in selecting and organizing materials for instruction in middle level/high music education. Examines a variety of professional resources available to support learning. Introduces research-based instructional practices and lesson/unit planning. Situates teaching, learning, and assessment within the context of state and national standards. Also offered for graduate-level credit as ITP 525 and may be taken fall, winter, and spring terms for credit.

Prerequisite: Admission into the Secondary Graduate Teacher Education Program (GTEP), Secondary Dual Endorsement Program (SDEP), or the Bilingual Teacher Pathway (BTP) Program.

**ITP 426 - Secondary World Languages Methods (2-4)**
Issues and methods in selecting and organizing materials for instruction in middle level and high school world languages. Examines a variety of professional resources available to support learning. Introduces research-based instructional practices and lesson/unit planning. Situates teaching, learning, and assessment within the context of state and national standards. Also offered for graduate-level credit as ITP 526 and may be taken fall, winter, and spring terms for credit.

Prerequisite: Admission to the Bilingual Teacher Pathway Program.

**ITP 438 - Integrated Methods and Curriculum Design (2-6)**
Emphasize inquiry processes, and place-based, project-based approaches to teaching and learning in grades PK-8. Design integrated units of study that focus on social studies, health, art, music, and movement. Teacher Candidates spend approximately 30 hours working with children through an integrated, project-based community learning experience. Also offered for graduate-level credit as ITP 538 and may be taken only once for credit.

Prerequisite: admission to a teacher education program.
ITP 439 - Elementary Mathematics Methods (3)

Emphasizes meaningful understanding of elementary-level mathematical concepts as well as strategies for developing competence with procedures and problem solving. Situates teaching, learning, and assessment within the multiple contexts of elementary classrooms, state and national standards, and research-based practices. Also offered for graduate-level credit as ITP 539 and may be taken only once for credit.

Prerequisite: admission to the Graduate Teacher Education Program.

ITP 442 - Integrated Elementary Science Methods (2)

Emphasis on effective methods and practices for developing integrated, interdisciplinary units of instruction. Explore approaches to teaching science at the elementary grades and integrating science content and processes with content and processes from other content areas (e.g., literacy, mathematics, the arts). Also offered for graduate-level credit as ITP 542 and may be taken only once for credit.

Prerequisite: Admission to Elementary Graduate Teacher Education Program or Bilingual Teacher Pathway Program.

ITP 452 - Reflective Practitioner (1-3)

Perspectives and techniques for formal and informal analysis, information gathering, decision making, value judgments about educational practice. Also offered for graduate-level credit as ITP 552 and may be taken for credit in winter and spring terms.

Prerequisite: admission to the teacher education program.

ITP 453 - Planning, Assessment, and Curriculum (3)

This course explores the theoretical frameworks and practical strategies that assist new teachers in planning effective classroom curriculum, assessments and instruction across academic subject areas, while focusing on the developmental and learning needs of students. Students will learn and practice a variety of techniques for unit and lesson planning, thoughtful instructional strategies and best practices in specific content areas, and how to develop formative classroom assessments that are standards-based and are aligned with instruction and curriculum design. Also offered for graduate-level credit as ITP 553 and may be taken only once for credit.

Prerequisite: admission to the Bilingual Teacher Pathway Program.

ITP 454 - Professional Development and Reflection (2)

Course designed to assist students in the beginning development of their profession as teachers, become familiar with national, state, and district teaching standards for teachers and K-12 students and become knowledgeable on educational law. Students will develop an initial teaching philosophy paper that will reflect their personal expression of values and goals as they relate to their practice. This paper will be refined throughout the program. Additionally, students will begin observation and data gathering in their district’s learning community. Also offered for graduate-level credit as ITP 554 and may be taken only once for credit.

Prerequisite: admission to the Bilingual Teacher Pathway Program.

ITP 455 - Language and Literacy Development of Diverse Learners (3)

Course designed for preservice teachers to help them guide elementary, mid-level, and secondary students in acquiring skills needed for reading, thinking, writing, and study in the content areas. Emphasis on the functional teaching of reading and writing—design and preparation of materials to use with textbooks in all school subjects. Also offered for graduate-level credit as ITP 555 and may be taken only once for credit.

Prerequisite: admission to the Bilingual Teacher Pathway Program.

ITP 456 - Formative Classroom Assessment (3)

Course designed to assist students in developing effective classroom assessment strategies and learning environments to maximize content and process outcomes for diverse students. Also offered for graduate-level credit as ITP 456 and may be taken only once for credit.

Prerequisite: admission to the Bilingual Teacher Pathway Program.

ITP 457 - Assessment and Decision Making (3)

Course designed to assist students in planning effective classroom assessment, instruction, and decision making and responding to disruptions. Course emphasizes creating positive learning environments for students from diverse backgrounds in multicultural classrooms. Also offered for undergraduate-level credit as ITP 411 and may be taken only once for credit.

Prerequisite: admission to the Bilingual Teacher Pathway Program, Graduate Teacher Education Program, or Secondary Dual Educator Program.

ITP 512 - Learning and the Learner (1-3)

Candidates identify themselves as learners, recognize the learning needs of their students, understand the learning theories relevant to educational practice, and identify the most useful elements of learning theories to inform their developing educational philosophy. Identify effective strategies and learning environments to maximize content and process outcomes for diverse students. Also offered for undergraduate-level credit as ITP 412 and may be taken only once for credit.

Prerequisite: admission to a teacher education program.

ITP 513 - Technology as a Tool for Learning (3)

Use of digital tools to enhance teacher productivity and professional development and for planning, instruction, and assessment of student learning. Employ technology to foster information literacy and digital citizenship. Engage diverse learners in inquiry, communication and collaboration, creation, visual design, and production of media. Also offered for undergraduate-level credit as ITP 413 and may be taken only once for credit.

Prerequisite: Admission into the Secondary Graduate Teacher Education Program (GTEP), Secondary Dual Endorsement Program (SDEP), or the Bilingual Teacher Pathway (BTP) Program and others with instructor approval.

ITP 514 - Educating for Equity and Social Justice (3)

Explore issues of identity, linguistics, race, ethnicity, sexual orientation, gender, social class, ability, and other forms of diversity. Teacher candidates gain an understanding of how culture influences educational processes, as well as their role and
responsibility in creating socially just and equitable classrooms/schools, where all students and families are valued. Also offered for undergraduate-level credit as ITP 414 and may be taken only once for credit.

Prerequisite: Admission into the Graduate Teacher Education Program (GTEP), Secondary Dual Endorsement Program (SDEP), or the Bilingual Teacher Pathway (BTP) Program and others with instructor approval.

ITP 515 - Foundations of Culturally and Linguistically Responsive Practice at the Secondary Level (3)

This course will equip secondary teacher candidates with knowledge and skills to facilitate instruction for English Language Learners (ELLs). Candidates learn the developmental progress of acquiring English for ELLs, and the role/responsibility of the teacher to create a positive climate and utilize instructional strategies that are culturally and linguistically responsive.

Prerequisite: Admission into the Secondary Graduate Teacher Education Program, Secondary Dual Endorsement Program (SDEP), or the Bilingual Teacher Pathway (BTP) program, and others with instructor approval.

ITP 516 - Engaging Young Adolescent Learners (3)

Approaches for effectively educating young adolescents (10 to 15 year olds) in middle grades schools. Emphasizes identity formation, developmental responsiveness, motivation and engagement, culturally relevant practice, instructional strategies, and authentic learning opportunities.

Examines educational policy and current trends in secondary school reform. Also addresses transitions occurring between school levels.

Prerequisite: Admission to the Graduate Teacher Education Program, Master’s in Curriculum and Instruction, and others with instructor approval.

ITP 517 - Engaging Adolescent Learners (3)

Approaches for effectively educating adolescent learners. Includes student motivation and engagement, instructional strategies, developmentally responsive approaches, culturally responsive practice, and authentic learning opportunities.

Examines educational policy in middle grades schools (K-8, 6-8) and high schools (9-12) and current trends of high school/middle school reform.

Prerequisite: Admission to the Secondary Graduate Teacher Education Program, Masters in Curriculum and Instruction, and others with instructor approval.

ITP 518 - Assessment for Learning (2)

Concentrated study of key terminology around assessment and the application of multiple assessment methods to engage learners in their own growth, to monitor learner progress, and to guide instructional decision-making. Course includes strategies and procedures to collect, interpret and act on assessment data. Expected preparation: Admission into the Secondary Graduate Teacher Education Program.

ITP 520 - Literacies in the Disciplines (3)

Course designed to help educators guide their students in acquiring skills needed for adequate reading, thinking, writing, and study in content areas. Emphasis on the functional teaching of reading and writing, the design and preparation of materials to use with textbooks in all subject areas.

Prerequisite: admission to a teacher education program.

ITP 521 - Secondary Art Methods (2-4)

Issues and methods in selecting and organizing materials for instruction in middle level/high art education. Examines a variety of professional resources available to support learning. Introduces research-based instructional practices and lesson/unit planning. Situates teaching, learning, and assessment within the context of state and national standards. Also offered for undergraduate-level credit as ITP 421 and may be taken fall, winter, and spring terms for credit.

Prerequisite: Admission into the Master of Education degree program and admission into Teacher Education Program.

ITP 522 - Secondary English Language Arts Methods (2-4)

Issues and methods in selecting and organizing materials for instruction in middle level/high school language arts education.

Examines a variety of professional resources available to support learning. Introduces research-based instructional practices and lesson/unit planning. Situates teaching, learning, and assessment within the context of state and national standards. Also offered for undergraduate-level credit as ITP 422 and may be taken fall, winter, and spring terms for credit.

Prerequisite: Admission into the Secondary Graduate Teacher Education Program (GTEP), Secondary Dual Endorsement Program (SDEP), or the Bilingual Teacher Pathway (BTP) Program.

ITP 523 - Secondary Health and Physical Education Methods (2-4)

Issues and methods in selecting and organizing materials for instruction in middle and high school health and K-12 physical education. Examines a variety of professional resources available to support learning. Introduces research-based instructional practices and lesson/unit planning. Situates teaching, learning, and assessment within the context of state and national standards. Also offered for undergraduate-level credit as ITP 423 and may be taken fall, winter, and spring terms for credit.

Prerequisite: Admission into the Master of Education degree program and admission into Teacher Education Program.

ITP 524 - Secondary Mathematics Methods (2-4)

Issues and methods in selecting and organizing materials for instruction in middle level and high mathematics education. Examines a variety of professional resources available to support learning. Introduces research-based instructional practices and lesson/unit planning. Situates teaching, learning, and assessment within the context of state and national standards. Also offered for undergraduate-level credit as ITP 424 and may be taken fall, winter, and spring terms for credit.

ITP 525 - Secondary Music Methods (2-4)

Issues and methods in selecting and organizing materials for instruction in middle level/high music education. Examines a variety of professional resources available to support learning. Introduces research-based instructional practices and lesson/unit planning. Situates teaching, learning, and
assessments within the context of state and national standards. Also offered for undergraduate-level credit as ITP 425 and may be taken fall, winter, and spring terms for credit.

Prerequisite: Admission into the Secondary Graduate Teacher Education Program (GTEP), Secondary Dual Endorsement Program (SDEP), or the Bilingual Teacher Pathway (BTP) Program.

**ITP 526 - Secondary Science Methods (2-4)**

Issues and methods in selecting and organizing materials for instruction in middle level/high school science education. Examines a variety of professional resources available to support learning. Introduces research-based instructional practices and lesson/unit planning. Situates teaching, learning, and assessment within the context of state and national standards. Also offered for undergraduate-level credit as ITP 426 and may be taken fall, winter, and spring terms for credit.

Prerequisite: Admission into a graduate teacher preparation program.

**ITP 527 - Secondary Social Studies Methods (2-4)**

Issues and methods in selecting and organizing materials including digital resources for instruction in middle level and high school social studies education. Examines a variety of professional resources available to support learning. Introduces research-based instructional practices and lesson/unit planning. Situates teaching, learning, and assessment within the context of state and national standards. Also offered for undergraduate-level credit as ITP 427 and may be taken fall, winter, and spring terms for credit.

Prerequisite: Admission into the Secondary Graduate Teacher Education Program (GTEP), Secondary Dual Endorsement Program (SDEP), or the Bilingual Teacher Pathway (BTP) Program.

**ITP 528 - Secondary World Languages Methods (2-4)**

Issues and methods in selecting and organizing materials for instruction in middle level and high school world languages. Examines a variety of professional resources available to support learning. Introduces research-based instructional practices and lesson/unit planning. Situates teaching, learning, and assessment within the context of state and national standards. Also offered for undergraduate-level credit as ITP 428 and may be taken fall, winter, and spring terms for credit.

Prerequisite: Admission to the Secondary Graduate Teacher Education Program and concurrent enrollment in CI 554/556 Student Teaching I course.

**ITP 530 - Student Teaching I, Middle Level (4-18)**

Observation, collaborative and independent planning, teaching, assessment, and reflection under the guidance of the Cooperating Teacher and University Supervisor; related professional activities. Ongoing inquiry and connection of theory and practice, including methods coursework. Completion of the first unit of study.

Prerequisite: Admission to the teacher education program.

**ITP 531 - Student Teaching II, Middle Level (9-13)**

Observation, collaborative and independent planning, teaching, assessment, and reflection under the guidance of the Cooperating Teacher and University Supervisor; related professional activities. Ongoing inquiry and connection of theory and practice, including methods coursework. Completion of the second unit of study.

Prerequisite: Admission to the Secondary Graduate Teacher Education Program and successful completion of Student Teaching I.

**ITP 532 - Student Teaching II, High School (9-13)**

Observation, collaborative and independent planning, teaching, assessment, and reflection under the guidance of the Cooperating Teacher and University Supervisor; related professional activities. Ongoing inquiry and connection of theory and practice, including methods coursework. Completion of the second unit of study.

Prerequisite: Admission to a secondary teacher education program.

**ITP 533 - Foundations of Culturally and Linguistically Responsive Practice at the Elementary Level (2)**

This course will equip elementary teacher candidates with knowledge and skills to organize instruction for English Language Learners (ELL). Candidates learn the developmental progress of acquiring English for ELL students, and the role/responsibility of teacher to create a positive climate and utilize instructional strategies that are culturally and linguistically responsive.

Prerequisite: Admission into the Elementary Graduate Teacher Education Program.

**ITP 534 - Cultivating Responsive Elementary Classrooms (1)**

This three-part course explores approaches to designing the social, physical, and instructional environment of a classroom in a way that is responsive to students and supports learning. Summer and fall terms involve face-to-face sessions addressing classroom climate and culturally responsive practices. Winter term involves online discussion of differentiation and planning.

Prerequisite: Admission to Elementary Graduate Teacher Education Program.
ITP 536 - Learning and Development (3)
Prospective elementary educators will understand and apply principles of human learning and development. The psychology of learning in a school setting includes both individual and group generalizations. This course will explore the roles of teacher as facilitator of learning and decision maker to best meet learners’ needs.
Prerequisite: admission to Elementary Graduate Teacher Education Program.

ITP 538 - Integrated Methods and Curriculum Design (1-6)
Emphasize inquiry processes, and place-based, project-based approaches to teaching and learning in grades PK-8. Design integrated units of study that focus on social studies, health, art, music, and movement. Teacher Candidates spend approximately 30 hours working with children through an integrated, project-based community learning experience. Also offered for undergraduate-level credit as ITP 438 and may be taken only once for credit.
Prerequisite: admission to a teacher education program.

ITP 539 - Elementary Mathematics Methods (3)
Emphasizes meaningful understanding of elementary-level mathematical concepts as well as strategies for developing competence with procedures and problem solving. Situates teaching, learning, and assessment within the multiple contexts of elementary classrooms, state and national standards, and research-based practices. Also offered for undergraduate-level credit as ITP 439 and may be taken only once for credit.
Prerequisite: admission to the Graduate Teacher Education Program.

ITP 540 - Foundations of Literacy (3)
An introduction to literacy processes. Address teaching practices specifically for elementary learners in grades PK-3. Examine emergent and early reading processes, how to assess them, and how to support their development in classrooms. Literacy development characteristics and teaching approaches for students who are culturally and linguistically diverse are addressed explicitly in the course.
Prerequisite: admission to the teacher education program.

ITP 541 - Literacies in the Elementary Classroom (4)
Emphasis on the methods and theories surrounding teaching and learning literacy in grades 3-8. Literacy development characteristics and teaching approaches for diverse learners are addressed, as well as the integration of literacy across content areas.
Prerequisite: admission to Elementary Graduate Teacher Education Program.

ITP 542 - Integrated Elementary Science Methods (2)
Emphasis on effective methods and practices for developing integrated, interdisciplinary units of instruction. Explore approaches to teaching science at the elementary grades and integrating science content and processes with content and processes from other content areas (e.g., literacy, mathematics, the arts). Also offered for undergraduate-level credit as ITP 442 and may be taken only once for credit.
Prerequisite: Admission to Elementary Graduate Teacher Education Program or Bilingual Teacher Pathway Program.

ITP 544 - Clinical Support for Elementary Teachers (3)
Synthesize learning from coursework and clinical experiences in a culminating cycle of inquiry that uses results of action research to inform a candidate’s professional practice during full-time student teaching and implementing a unit of study. Provide opportunities to consult with colleagues and program faculty to support classroom research.
Prerequisite: admission to the Elementary Graduate Teacher Education Program and concurrent enrollment in Student Teaching III.

ITP 545 - Student Teaching I, Early Childhood (1-4)
Observation, collaborative and independent planning, teaching, assessment, and reflection under the guidance of the Cooperating Teacher and University Supervisor; related professional activities. Ongoing inquiry and connection of theory and practice, including methods coursework.
Prerequisite: Admission to the teacher education program.

ITP 546 - Student Teaching II, Early Childhood (6-9)
Observation and teaching under direction of classroom teacher and University supervisor. Direct responsibility for learning activities, developing skills in techniques of teaching and classroom management; related professional activities. Weekly seminar.
Prerequisite: admission to the teacher education program.

ITP 547 - Student Teaching III, Early Childhood (12)
Observation, collaborative and independent planning, teaching, assessment, and reflection under the guidance of the Cooperating Teacher and University Supervisor; related professional activities. Ongoing inquiry and connection of theory and practice, including methods coursework. Completion of the second unit of study. Seminar meetings and program events.
Prerequisite: admissions to the Elementary Graduate Teacher Education Program.

ITP 548 - Student Teaching I, Elementary (1-4)
Observation, collaborative and independent planning, teaching, assessment, and reflection under the guidance of the Cooperating Teacher and University Supervisor; related professional activities. Ongoing inquiry and connection of theory and practice, including methods coursework.
Prerequisite: Admission to the teacher education program.

ITP 549 - Student Teaching II, Elementary (6-9)
Observation, collaborative and independent planning, teaching, assessment, and reflection under the guidance of the Cooperating Teacher and University Supervisor; related professional activities. Ongoing inquiry and connection of theory and practice, including methods coursework. Completion of the first unit of study.
Prerequisite: Admission to the teacher education program.
ITP 550 - Student Teaching III, Elementary (12)
Observation, collaborative and independent planning, teaching, assessment, and reflection under the guidance of the Cooperating Teacher and University Supervisor; related professional activities. Ongoing inquiry and connection of theory and practice, including methods coursework. Completion of the second unit of study. Seminar meetings and program events.
Prerequisite: admission to Elementary Graduate Teacher Education Program.

ITP 552 - Reflective Practitioner (1-3)
Perspectives and techniques for formal and informal analysis, information gathering, decision making, value judgments about educational practice. Also offered for undergraduate-level credit as ITP 452 and may be taken for credit in winter and spring terms.
Prerequisite: admission to the teacher education program.

ITP 553 - Planning, Assessment, and Curriculum (3)
This course explores the theoretical frameworks and practical strategies that assist new teachers in planning effective classroom curriculum, assessments and instruction across academic subject areas, while focusing on the developmental and learning needs of students. Students will learn and practice a variety of techniques for unit and lesson planning, thoughtful instructional strategies and best practices in specific content areas, and how to develop formative classroom assessments that are standards-based and are aligned with instruction and curriculum design. Also offered for undergraduate-level credit as ITP 453 and may be taken only once for credit.
Prerequisite: admission to the Bilingual Teacher Pathway Program.

ITP 554 - Professional Development and Reflection (2)
Course designed to assist students in the beginning development of their profession as teachers, become familiar with national, state, and district teaching standards for teachers and K-12 students and become knowledgeable on educational law. Students will develop an initial teaching philosophy paper that will reflect their personal expression of values and goals as they relate to their practice. This paper will be refined throughout the program. Additionally, students will begin observation and data gathering in their district’s learning community. Also offered for undergraduate-level credit as ITP 454 and may be taken only once for credit.
Prerequisite: admission to the Bilingual Teacher Pathway Program.

ITP 555 - Language and Literacy Development of Diverse Learners (3)
Course designed for preservice teachers to help them guide elementary, mid-level, and secondary students in acquiring skills needed for reading, thinking, writing, and study in the content areas. Emphasis on the functional teaching of reading and writing - the design and preparation of materials to use with textbooks in all school subjects. Also offered for undergraduate-level credit as ITP 455 and may be taken only once for credit.
Prerequisite: admission to the Bilingual Teacher Pathway Program.

ITP 556 - Language and Literacy Development of Diverse Learners (3)
Course designed for preservice teachers to help them guide elementary, mid-level, and secondary students in acquiring skills needed for reading, thinking, writing, and study in the content areas. Emphasis on the functional teaching of reading and writing - the design and preparation of materials to use with textbooks in all school subjects. Also offered for undergraduate-level credit as ITP 455 and may be taken only once for credit.
Prerequisite: admission to the Bilingual Teacher Pathway Program.

ITP 558 - Student Teaching I in Inclusive ML/HS (6)
Observation, collaborative and independent planning, teaching, assessment, and reflection under the guidance of the Cooperating Teacher and University Supervisor; related professional activities. Ongoing inquiry and connection of theory and practice, including methods coursework. Completion of the first unit of study. Seminar meetings and program events.
Prerequisite: Admission to the Secondary Dual Educator Preparation Program.

ITP 581 - Student Teaching II in Inclusive ML/HS (12)
Observation, collaborative and independent planning, teaching, assessment, and reflection under the guidance of the Cooperating Teacher and University Supervisor; related professional activities. Ongoing inquiry and connection of theory and practice, including methods coursework. Completion of the second unit of study. Seminar meetings and program events.
Prerequisite: Admission to the Secondary Dual Educator Preparation Program.

Jpn - Japanese

Jpn 101 - First-year Japanese (5)
An introduction to the Japanese language with emphasis on listening comprehension, speaking, grammatical patterns, the syllabaries, and characters in elementary reading and writing. This is the first course in a sequence of three: Jpn 101, Jpn 102, and Jpn 103.

Jpn 101L - Lab for Japanese 101 (0)
Lab for Japanese 101.
Corequisite: Jpn 101.

Jpn 102 - First-year Japanese (5)
An introduction to the Japanese language with emphasis on listening comprehension, speaking, grammatical patterns, the syllabaries, and characters in elementary reading and writing. This is the second course in a sequence of three: Jpn 101, Jpn 102, and Jpn 103.

Jpn 102L - Lab for Japanese 102 (0)
Lab for Japanese 102.
Corequisite: Jpn 102.

Jpn 103 - First-year Japanese (5)
An introduction to the Japanese language with emphasis on listening comprehension, speaking, grammatical patterns, the syllabaries, and characters in elementary reading and writing. This is the third course in a sequence of three: Jpn 101, Jpn 102, and Jpn 103.

Jpn 103L - Lab for Japanese 103 (0)
Lab for Japanese 103.
Corequisite: Jpn 103.

Jpn 150 - First-year Japanese (Intensive) (7)
A two-term course covering the content of Jpn 101,102,103.

Jpn 151 - First-year Japanese (Intensive) (8)
A two-term course covering the content of Jpn 101,102,103.

Jpn 199 - Special Studies (1-8)
(Credit to be arranged.)

Jpn 201 - Second-year Japanese (5)
Continued work in the Japanese language with emphasis on listening comprehension, speaking, grammatical patterns, the
syllabaries, and characters in elementary reading and writing. This is the first course in a sequence of three: Jpn 201, Jpn 202, and Jpn 203. Recommended prerequisite: Jpn 103.

Jpn 201L - Lab for Japanese 201 (0)
Lab for Japanese 201.

Jpn 202 - Second-year Japanese (5)
Continued work in the Japanese language with emphasis on listening comprehension, speaking, grammatical patterns, the syllabaries, and characters in elementary reading and writing. This is the second course in a sequence of three: Jpn 201, Jpn 202, and Jpn 203. Recommended prerequisite: Jpn 103.

Jpn 202L - Lab for Japanese 202 (0)
Corequisite: Jpn 202.

Jpn 203 - Second-year Japanese (5)
Continued work in the Japanese language with emphasis on listening comprehension, speaking, grammatical patterns, the syllabaries, and characters in elementary reading and writing. This is the third course in a sequence of three: Jpn 201, Jpn 202, and Jpn 203. Recommended prerequisite: Jpn 103.

Jpn 203L - Lab for Japanese 203 (0)
Lab for Japanese 203.
Corequisite: Jpn 203.

Jpn 299 - Special Studies (1-12)
(Credit to be arranged.)

Jpn 301 - Third-year Japanese: Speaking and Listening (4)
Continued work in the Japanese language with emphasis on listening and speaking skills in a variety of contexts. Students enrolled in this course are encouraged to sign up for Jpn 304, 305 concurrently. Either sequence (Jpn 301, 302 or Jpn 304, 305) satisfies the International Studies requirement for third-year Japanese. This is the first course in a sequence of two: Jpn 301 and Jpn 302. Recommended prerequisite: Jpn 203.

Jpn 302 - Third-year Japanese: Speaking and Listening (4)
Continued work in the Japanese language with emphasis on listening and speaking skills in a variety of contexts. Students enrolled in this course are encouraged to sign up for Jpn 304, 305 concurrently. Either sequence (Jpn 301, 302 or Jpn 304, 305) satisfies the International Studies requirement for third-year Japanese. This is the second course in a sequence of two: Jpn 301 and Jpn 302. Recommended prerequisite: Jpn 203.

Jpn 304 - Third-year Japanese: Reading and Writing (4)
Continued work in the Japanese language with emphasis on reading and writing skills in different kinds of texts. Students enrolled in this course are encouraged to sign up for Jpn 301, 302 concurrently. Either sequence (Jpn 301, 302 or Jpn 304, 305) satisfies the International Studies requirement for third-year Japanese. This is the first course in a sequence of two: Jpn 304 and Jpn 305. Recommended prerequisite: Jpn 203.

Jpn 305 - Third-year Japanese: Reading and Writing (4)
Continued work in the Japanese language with emphasis on reading and writing skills in different kinds of texts. Students enrolled in this course are encouraged to sign up for Jpn 301, 302 concurrently. Either sequence (Jpn 301, 302 or Jpn 304, 305) satisfies the International Studies requirement for third-year Japanese. This is the second course in a sequence of two: Jpn 304 and Jpn 305. Recommended prerequisite: Jpn 203.

Jpn 314 - Beginning Japanese Grammar (2)
A systematic approach to the study of Japanese grammar for transfer students, majors, and teachers. This is the first course in a sequence of two: Jpn 314 and Jpn 315.

Jpn 315 - Intermediate Japanese Grammar (2)
A systematic approach to the study of Japanese grammar for transfer students, majors, and teachers. This is the second course in a sequence of two: Jpn 314 and Jpn 315.

Jpn 325 - Japanese Phonetics and Phonology (4)
Introduction to the sounds of Japanese: their place and manner of articulation (phonetics) as well as how they pattern with respect to each other and as influenced by morphological and syntactic factors (phonology). Recommended prerequisite: Jpn 203.

Jpn 341 - Topics in Japanese Literature (In Translation) (4)
Introductory survey of Japanese literature from its beginnings to the present, including such works as The Man'yoshu, The Tale of Genji, plays by Zeami and Chikamatsu, Basho's haiku, and masterpieces of modern fiction. Jpn 341 focuses on classical and medieval literature; Jpn 342 focuses on Tokugawa and modern literature. Conducted in English. This is the first course in a sequence of three: Jpn 341, Jpn 342, and Jpn 343.

Jpn 341U - Topics in Japanese Literature (In Translation) (4)
Introductory survey of Japanese literature from its beginnings to the present, including such works as The Man'yoshu, The Tale of Genji, plays by Zeami and Chikamatsu, Basho's haiku, and masterpieces of modern fiction. Jpn 341 focuses on classical and medieval literature; Jpn 342 focuses on Tokugawa and modern literature. Conducted in English. This is the second course in a sequence of three: Jpn 341, Jpn 342, and Jpn 343. Recommended prerequisite: 8 credits of literature.

Jpn 342 - Topics in Japanese Literature (In Translation) (4)
Introductory survey of Japanese literature from its beginnings to the present, including such works as The Man'yoshu, The Tale of Genji, plays by Zeami and Chikamatsu, Basho's haiku, and masterpieces of modern fiction. Jpn 341 focuses on classical and medieval literature; Jpn 342 focuses on Tokugawa and modern literature. Conducted in English. This is the second course in a sequence of three: Jpn 341, Jpn 342, and Jpn 343.
Tokugawa and modern literature. Conducted in English. This is the second course in a sequence of three: Jpn 341, Jpn 342, and Jpn 343. Recommended prerequisite: 8 credits of literature.

Jpn 343 - Topics in Japanese Literature (In Translation) (4)
Introductory survey of Japanese literature from its beginnings to the present, including such works as The Man'yoshu, The Tale of Genji, plays by Zeami and Chikamatsu, Basho’s haiku, and masterpieces of modern fiction. Jpn 341 focuses on classical and medieval literature; Jpn 342 focuses on Tokugawa and modern literature. Conducted in English. This is the third course in a sequence of three: Jpn 341, Jpn 342, and Jpn 343. Recommended prerequisite: 8 credits of literature.

Jpn 344 - Japanese Literature in Translation: Manga, Japanese Graphic Novels (4)
Readings of masterpieces of Japanese comic books, analysis of writing about the graphic-novel form. Readings of the manga are followed by discussion of the artistic style, questions about Japanese society, and each novel’s place in the history of the genre. Readings/discussions are in English. Expected preparation: 8 credits of literature.

Jpn 344U - Japanese Literature in Translation: Manga, Japanese Graphic Novels (4)
Readings of masterpieces of Japanese comic books, analysis of writing about the graphic-novel form. Readings of the manga are followed by discussion of the artistic style, questions about Japanese society, and each novel’s place in the history of the genre. Readings/discussions are in English. Expected preparation: 8 credits of literature.

Jpn 361 - Japanese Literature Through Film (4)
Readings of masterpieces of Japanese literature and viewing of feature films based on them. Viewings are followed by discussion of the social, historical, and artistic significance of the works. Readings and discussions are in English, and films have English subtitles.

Jpn 361U - Japanese Literature Through Film (4)
Readings of masterpieces of Japanese literature and viewing of feature films based on them. Viewings are followed by discussion of the social, historical, and artistic significance of the works. Readings and discussions are in English, and films have English subtitles.

Jpn 399 - Special Studies (1-6)
(Credit to be arranged.)

Jpn 404 - Cooperative Education/Internship (1-12)
(Credit to be arranged.)

Jpn 405 - Reading and Conference (1-8)
(Credit to be arranged.)

Jpn 407 - Seminar (1-6)
(Credit to be arranged.)

Jpn 408 - Workshop (1-8)
(Credit to be arranged.)

Jpn 409 - Practicum (1-12)
(Credit to be arranged.)

Jpn 410 - Selected Topics (1-6)
(Credit to be arranged.)

Jpn 411 - Advanced Japanese (4)
Development of oral communication, reading, and writing skills with complex patterns in informal and formal situations. This is the first course in a sequence of two: Jpn 411 and Jpn 412. Also offered for graduate-level credit as Jpn 511 and may be taken only once for credit. Expected preparation: Jpn 302, Jpn 305.

Jpn 412 - Advanced Japanese (4)
Development of oral communication, reading, and writing skills with complex patterns in informal and formal situations. This is the second course in a sequence of two: Jpn 411 and Jpn 412. Also offered for graduate-level credit as Jpn 512 and may be taken only once for credit. Expected preparation: Jpn 302, Jpn 305.

Jpn 414 - Advanced Japanese Grammar (4)
A systematic approach to the study of Japanese grammar for advanced students and majors, and for teachers. Also offered for graduate-level credit as Jpn 514 and may be taken only once for credit. Recommended prerequisite: Jpn 302 or 315.

Jpn 416 - Advanced Japanese: Reading and Writing (2)
Development of facility with complex patterns in reading and writing using semi-authentic and authentic materials. Recommended corequisites: Jpn 411/511, Jpn 412/512. This is the first course in a sequence of two: Jpn 416 and Jpn 417. Also offered for graduate-level credit as Jpn 516 and may be taken only once for credit. Recommended prerequisites: Jpn 302 and 305.

Jpn 417 - Advanced Japanese: Reading and Writing (2)
Development of facility with complex patterns in reading and writing using semi-authentic and authentic materials. Recommended corequisites: Jpn 411/511, Jpn 412/512. This is the second course in a sequence of two: Jpn 416 and Jpn 417. Also offered for graduate-level credit as Jpn 517 and may be taken only once for credit. Recommended prerequisites: Jpn 302 and 305.

Jpn 420 - Readings in Japanese Literature (4)
Reading, analysis, translation, and discussion of representative literary texts. Jpn 420/520 will focus on pre-modern literature, Jpn 421/521 on literature from the Meiji Period to the present. Conducted primarily in Japanese. This is the first course in a sequence of two: Jpn 420 and Jpn 421. Also offered for graduate-level credit as Jpn 520 and may be taken only once for credit. Recommended prerequisites: Jpn 302, Jpn 305.

Jpn 421 - Readings in Japanese Literature (4)
Reading, analysis, translation, and discussion of representative literary texts. Jpn 420/520 will focus on pre-modern literature, Jpn 421/521 on literature from the Meiji Period to the present. Conducted primarily in Japanese. This is the second course in a sequence of two: Jpn 420 and Jpn 421. Also offered for graduate-level credit as Jpn 521 and may be taken only once for credit. Recommended prerequisites: Jpn 302, Jpn 305.

Jpn 422 - Traditional Japanese Drama (4)
An introduction to the classical forms of no kyogen, bunraku and kabuki. Students read plays and view videos of plays in
performance, analyzing them in their historical, social, and performance contexts. Students have the option of performing short dances of plays in a class recital. Conducted in English. Also offered for graduate-level credit as Jpn 522 and may be taken only once for credit.

**Jpn 423 - Modern Japanese Poetry (4)**

An introduction to modern Japanese poetry including new forms (shi) and modern variations on traditional forms (tanka, haiku). Students read poems in Japanese, analyze syntax, learn genre requirements, and understand the history of modern Japanese poetry. Also offered for graduate-level credit as Jpn 523 and may be taken only once for credit.

Prerequisite: Jpn 416 and Jpn 417.

**Jpn 424 - Contemporary Japanese Poetry and Pop Culture (4)**

An introduction to contemporary Japanese pop culture including free verse, traditional tanka, song lyrics, and comic books (manga). Students read verse in Japanese, analyze syntax, learn genre requirements, and understand the history of modern Japanese poetry and songs; students analyze sequential-art narratives to understand multiple aspects of Japanese pop culture. Also offered for graduate-level credit as Jpn 524 and may be taken only once for credit.

Prerequisite: Jpn 416 and Jpn 417.

**Jpn 477 - Teaching Japanese As a Foreign Language (4)**

Principles of instructional methods in teaching Japanese to speakers of languages whose orthography is not Kanji-based. Readings in language pedagogy, particularly the pedagogy of non-Indo-European languages. Students are required to teach and observe classes in an approved Japanese program. This is the second course in a sequence of two: Jpn 477 and Jpn 478. Also offered for graduate-level credit as Jpn 577 and may be taken only once for credit. Recommended prerequisite: Ling 390, Jpn 303.

**Jpn 494 - Japanese Sociolinguistics (4)**

Study of the key concepts that characterize Japanese language and culture, along with empirical analysis of Japanese communication style. Also offered for graduate-level credit as Jpn 594 and may be taken only once for credit. Recommended prerequisite: Jpn 302.

**Jpn 501 - Research (1-8)**

(Credit to be arranged.)

**Jpn 503 - Thesis (1-12)**

(Credit to be arranged.)

**Jpn 504 - Cooperative Education/Internship (1-12)**

(Credit to be arranged.)

**Jpn 505 - Reading and Conference (1-8)**

(Credit to be arranged.)

**Jpn 507 - Seminar (1-12)**

(Credit to be arranged.)

**Jpn 508 - Workshop (1-8)**

(Credit to be arranged.)

**Jpn 509 - Practicum (1-12)**

(Credit to be arranged.)

**Jpn 510 - Selected Topics (1-12)**

(Credit to be arranged.)

**Jpn 511 - Advanced Japanese (4)**

Development of oral communication, reading, and writing skills with complex patterns in formal and informal situations. This is the first course in a sequence of two: Jpn 511 and Jpn 512. Also offered for undergraduate-level credit as Jpn 411 and may be taken only once for credit.

**Jpn 512 - Advanced Japanese (4)**

Development of oral communication, reading, and writing skills with complex patterns in informal and formal situations. This is the second course in a sequence of two: Jpn 511 and Jpn 512. Also offered for undergraduate-level credit as Jpn 412 and may be taken only once for credit.

**Jpn 514 - Advanced Japanese Grammar (4)**

A systematic approach to the study of Japanese grammar for advanced students and majors, and for teachers. Also offered for undergraduate-level credit as Jpn 414 and may be taken only once for credit. Recommended prerequisite: Jpn 302 or 315.

**Jpn 516 - Advanced Japanese: Reading and Writing (2)**

Development of facility with complex patterns in reading and writing using semi-authentic and authentic materials. Recommended corequisites: Jpn 411/511, Jpn 412/512. This is the first course in a sequence of two: Jpn 516 and Jpn 517. Also offered for undergraduate-level credit as Jpn 416 and may be taken only once for credit. Recommended prerequisites: Jpn 302 and 305.

**Jpn 517 - Advanced Japanese: Reading and Writing (2)**

Development of facility with complex patterns in reading and writing using semi-authentic and authentic materials. Recommended corequisites: Jpn 411/511, Jpn 412/512. This is the first course in a sequence of two: Jpn 516 and Jpn 517. Also offered for undergraduate-level credit as Jpn 417 and may be taken only once for credit. Recommended prerequisites: Jpn 302 and 305.

**Jpn 520 - Readings in Japanese Literature (4)**

Reading, analysis, translation, and discussion of representative literary texts. Jpn 420/520 will focus on pre-modern literature, Jpn 421/521 on literature from the Meiji Period to the present. Conducted primarily in Japanese. This is the first course in a sequence of two: Jpn 520 and Jpn 521. Also offered for undergraduate-level credit as Jpn 420 and may be taken only once for credit. Recommended prerequisites: Jpn 302, Jpn 305.

**Jpn 521 - Readings in Japanese Literature (4)**

Reading, analysis, translation, and discussion of representative literary texts. Jpn 420/520 will focus on pre-modern literature, Jpn 421/521 on literature from the Meiji Period...
to the present. Conducted primarily in Japanese. This is the second course in a sequence of two: Jpn 520 and Jpn 521. Also offered for undergraduate-level credit as Jpn 421 and may be taken only once for credit. Recommended prerequisites: Jpn 302, Jpn 305.

**Jpn 522 - Traditional Japanese Drama (4)**

An introduction to the classical forms of no kyogen, bunraku and kabuki. Students read plays and view videos of plays in performance, analyzing them in their historical, social, and performance contexts. Students have the option of performing short dances of plays in a class recital. Conducted in English. Also offered for undergraduate-level credit as Jpn 422 and may be taken only once for credit.

**Jpn 523 - Modern Japanese Poetry (4)**

An introduction to modern Japanese poetry including new forms (shi) and modern variations on traditional forms (tanka, haiku). Students read poems in Japanese, analyze syntax, learn genre requirements, and understand the history of modern Japanese poetry. Also offered for undergraduate-level credit as Jpn 423 and may be taken only once for credit.

Prerequisite: Jpn 416 and Jpn 417.

**Jpn 524 - Contemporary Japanese Poetry and Pop Culture (4)**

An introduction to contemporary Japanese pop culture including free verse, traditional tanka, song lyrics, and comic books (manga). Students read verse in Japanese, analyze syntax, learn genre requirements, and understand the history of modern Japanese poetry and songs; students analyze sequential-art narratives to understand multiple aspects of Japanese pop culture. Also offered for undergraduate-level credit as Jpn 424 and may be taken only once for credit.

Prerequisite: Jpn 416 and Jpn 417.

**Jpn 551 - Japanese Language and Literature (4)**

An introduction to modern Japanese language and culture. This is the second course in a sequence of two: Jpn 520 and Jpn 521. Also offered for undergraduate-level credit as Jpn 421 and may be taken only once for credit. Recommended prerequisites: Jpn 302, Jpn 305.

**Jpn 552 - Japanese Language and Linguistics (4)**

Comparative study of intellectual approaches to Japanese language and its analysis, including native (kokugo) theories, American structuralism, modern linguistics, and critical theory. Emphasis will vary from year to year.

**Jpn 553 - Critical Approaches to Japanese Language and Literature (4)**

Comparative study of intellectual approaches and research of Japanese language or literature, with an emphasis on secondary texts (research). Topics will vary from year to year.

Prerequisite: WLL 560 and 4th-year Japanese reading ability and one additional linguistics or literature course.

**Jpn 577 - Teaching Japanese As a Foreign Language (4)**

Principles of instructional methods in teaching Japanese to speakers of languages whose orthography is not Kanji-based. Readings in language pedagogy, particularly the pedagogy of non-Indo-European languages. Students are required to teach and observe classes in an approved Japanese program. This is the first course in a sequence of two: Jpn 577 and Jpn 578. Also offered for undergraduate-level credit as Jpn 477 and may be taken only once for credit.

Recommended prerequisites: Ling 390, Jpn 303.

**Jpn 578 - Teaching Japanese As a Foreign Language (4)**

Principles of instructional methods in teaching Japanese to speakers of languages whose orthography is not Kanji-based. Readings in language pedagogy, particularly the pedagogy of non-Indo-European languages. Students are required to teach and observe classes in an approved Japanese program. This is the second course in a sequence of two: Jpn 577 and Jpn 578. Also offered for undergraduate-level credit as Jpn 478 and may be taken only once for credit.

Recommended prerequisites: Ling 390, Jpn 303.

**Jpn 594 - Japanese Sociolinguistics (4)**

The study of the key concepts that characterize Japanese language and culture, along with empirical analysis of Japanese communication style. Also offered for undergraduate-level credit as Jpn 494 and may be taken only once for credit.

Recommended prerequisite: Jpn 302.

**Jst - Judaic Studies**

**Jst 201 - Introduction to Judaism (4)**

Traces the development of Judaism as a religious system and civilization from the biblical period through the middle ages and into the modern era. Describes the practices and beliefs of Judaism as a lived religion primarily through the investigation of primary sources.

**Jst 299 - Special Studies (1-4)**

(Credit to be arranged.)

**Jst 317 - Jewish History from Antiquity to the Medieval Period (4)**

Introduces students to the Jewish historical experience from its Biblical origins through the end of the first millennium CE primarily by means of close readings of primary sources. Describes the diverse forms of Jewish life under Persian, Greco-Roman, Early Christian and Muslim rule and examines the boundaries of pre-modern Jewish cultural and religious identity. This is the same course as Hst 317 and may be taken only once for credit.

Crosslisted as: Hst 317.

**Jst 317U - Jewish History from Antiquity to the Medieval Period (4)**

Introduces students to the Jewish historical experience from its Biblical origins through the end of the first millennium CE primarily by means of close readings of primary sources. Describes the diverse forms of Jewish life under Persian, Greco-Roman, Early Christian and Muslim rule and examines the boundaries of pre-modern Jewish cultural and religious identity. This is the same course as Hst 317 and may be taken only once for credit.

Crosslisted as: Hst 317U.

**Jst 318 - Jewish History from the Medieval Period to the Present (4)**

Survey of Jewish history from the year 1000 to the present, covering major developments in Jewish society and culture in the medieval Islamic and Christian realms, early modern Europe and the Middle East, and the modern world. Topics include religious thought, communal and political
structures, and Jewish/non-Jewish relations. This is the same course as Hst 318 and may be taken only once for credit.

Crosslisted as: Hst 318.

JSt 318U - Jewish History from the Medieval Period to the Present (4)
Survey of Jewish history from the year 1000 to the present, covering major developments in Jewish society and culture in the medieval Islamic and Christian realms, early modern Europe and the Middle East, and the modern world. Topics include religious thought, communal and political structures, and Jewish/non-Jewish relations. This is the same course as Hst 318 and may be taken only once for credit.

Crosslisted as: Hst 318U.

JSt 319 - Rabbinic Culture in the Roman World (4)
Introduction to history and literature of the rabbinic movement in Roman Palestine, 70 CE-500 CE. Origins of the rabbis, their role in society, genres of rabbinic literature (Mishnah, Talmud, Midrash), rabbinic law and theology and rabbinic attitudes towards the urban culture of the Roman Near East. This is the same course as Hst 319 and may be taken only once for credit.

Crosslisted as: Hst 319.

JSt 319U - Rabbinic Culture in the Roman World (4)
Introduction to history and literature of the rabbinic movement in Roman Palestine, 70 CE-500 CE. Origins of the rabbis, their role in society, genres of rabbinic literature (Mishnah, Talmud, Midrash), rabbinic law and theology and rabbinic attitudes towards the urban culture of the Roman Near East. This is the same course as Hst 319 and may be taken only once for credit.

Crosslisted as: Hst 319U.

JSt 324U - Historical Introduction to the Hebrew Bible/Old Testament (4)

JSt 325 - Retelling the Bible (4)
Discusses how the Bible was read in antiquity. Surveys the genres of early Jewish Biblical interpretation, including inter-Biblical interpretation, rewritten Bible, translation, allegory, allusion. Sources include the Apocrypha and Pseudepigrapha, the Dead Sea Scrolls, Greco-Jewish literature and Rabbinic Midrash

JSt 325U - Retelling the Bible (4)
Discusses how the Bible was read in antiquity. Surveys the genres of early Jewish Biblical interpretation, including inter-Biblical interpretation, rewritten Bible, translation, allegory, allusion. Sources include the Apocrypha and Pseudepigrapha, the Dead Sea Scrolls, Greco-Jewish literature and Rabbinic Midrash

JSt 333 - Israeli Culture and Society (4)
Investigates the foundation and development of an Israeli national culture and its role in shaping contemporary Israeli society. Explores how history, politics, gender, religion, and ethnicity operate in the public arena. Key topics include myth and memory, public and state events, music and dance, theater and architecture. No prerequisites required.

JSt 333U -Israeli Culture and Society (4)
Investigates the foundation and development of an Israeli national culture and its role in shaping contemporary Israeli society. Explores how history, politics, gender, religion, and ethnicity operate in the public arena. Key topics include myth and memory, public and state events, music and dance, theater and architecture. No prerequisites required.

JSt 335 - Sex, Love, and Gender in Israel (4)
Examines intersections of gender and nationalism; the role of masculinity; conceptions of femininity, sex, love, and motherhood; and the impact of gender on the Arab-Israeli conflict. Investigates the history and experiences of a diverse array of women in Israel, including Jewish women, Israeli Arab and Palestinian women, and foreign workers.

JSt 378 - Pagans, Christians and Jews (4)
Discusses the development and interaction of Roman paganism, Christianity and Judaism during the period of Late Antiquity. Topics will include education, philosophy, asceticism, ritual, religious law, the image of the holy man and the phenomenon of religious polemic in the Later Roman Empire (c. 250-600 CE). This is the same course as Hst 378 and may be taken only once for credit.

Crosslisted as: Hst 378.

JSt 378U - Pagans, Christians and Jews (4)
Discusses the development and interaction of Roman paganism, Christianity and Judaism during the period of Late Antiquity. Topics will include education, philosophy, asceticism, ritual, religious law, the image of the holy man and the phenomenon of religious polemic in the Later Roman Empire (c. 250-600 CE). This is the same course as Hst 378 and may be taken only once for credit.

Crosslisted as: Hst 378U.

JSt 379 - History of Zionism (4)
Zionism as ideology and practice in context of Jewish and European history. Includes society and culture Zionism created under the British mandate of Palestine, roots of the Arab-Jewish conflict in this context, and impact on Jewish life and politics in Eastern and Central Europe and the United States. This is the same course as Hst 379 and may be taken only once for credit.

Crosslisted as: Hst 379.

JSt 379U - History of Zionism (4)
Zionism as ideology and practice in context of Jewish and European history. Includes society and culture Zionism created under the British mandate of Palestine, roots of the Arab-Jewish conflict in this context, and impact on Jewish life and politics in Eastern and Central Europe and the United States. This is the same course as Hst 379 and may be taken only once for credit.

Crosslisted as: Hst 379U.
JSt 380 - The Holocaust (4)
An introduction to the Nazi-planned and executed genocide of European Jewry known as the Holocaust. Topics include the German and European contexts for the rise of Nazism; antisemitism and its links to Nazi ideology and policy; European Jewry in the interwar period; the "Final Solution"; resistance and collaboration. This is the same course as Hst 380 and may be taken only once for credit.
Crosslisted as: Hst 380U.

JSt 380U - The Holocaust (4)
An introduction to the Nazi-planned and executed genocide of European Jewry known as the Holocaust. Topics include the German and European contexts for the rise of Nazism; antisemitism and its links to Nazi ideology and policy; European Jewry in the interwar period; the "Final Solution"; resistance and collaboration. This is the same course as Hst 380 and may be taken only once for credit.

Crosslisted as: Hst 380U.

JSt 381 - Kabbalah: The Jewish Mystical Tradition (4)
Surveys the origins and development of the Jewish mystical tradition set against the context of Jewish religious, social, and intellectual history. Topics include mystical visions in ancient Jewish texts, medieval Kabbalah and the Zohar, the Sabbatean messianic movement, Hasidism, and contemporary uses of Kabbalah. This is the same course as Hst 381 and may be taken only once for credit.

Crosslisted as: Hst 381.

JSt 381U - Kabbalah: The Jewish Mystical Tradition (4)
Surveys the origins and development of the Jewish mystical tradition set against the context of Jewish religious, social, and intellectual history. Topics include mystical visions in ancient Jewish texts, medieval Kabbalah and the Zohar, the Sabbatean messianic movement, Hasidism, and contemporary uses of Kabbalah. This is the same course as Hst 381 and may be taken only once for credit.

Crosslisted as: Hst 381U.

JSt 388 - History of Modern Israel (4)
Surveys the evolution of modern Israel, exploring social, political, cultural, and intellectual developments from 1880 to the present. Topics include the emergence of the Zionist movement; political, cultural, and social developments before and after 1948; the Arab-Israeli conflict; and the social framework of Israeli society.

JSt 388U - History of Modern Israel (4)
Surveys the evolution of modern Israel, exploring social, political, cultural, and intellectual developments from 1880 to the present. Topics include the emergence of the Zionist movement; political, cultural, and social developments before and after 1948; the Arab-Israeli conflict; and the social framework of Israeli society.

JSt 399 - Special Studies (1-4)
(Credit to be arranged.)

JSt 401 - Research (0-6)
(Credit to be arranged.)

JSt 402 - Independent Study (1-12)
(Credit to be arranged.)

JSt 404 - Cooperative Ed/Internship (1-12)
(Credit to be arranged.)

JSt 405 - Reading and Conference (0-6)
(Credit to be arranged.)

JSt 407 - Seminar (1-4)
(Credit to be arranged.)

JSt 407H - (1 - 4)

JSt 409 - Practicum (1-8)
(Credit to be arranged.)

JSt 410 - Special Topics (1-4)
(Credit to be arranged.)

JSt 430 - Messiahs and Messianism (4)
Messianic ideas in Judaism and other religions. Can focus on specific messiah figures and movements, comparative messianisms, historical and conceptual development of messianic idea, and/or modern manifestations. Repeatable once with departmental approval.
Prerequisite: 8 upper division credits in Judaic Studies, or related courses with permission of instructor.

JSt 435 - Jewish and Israeli Dance History (4)
Examines the development of Jewish and Israeli dance in the twentieth century. Exploring social and concert dance forms, topics include the development of Israeli folk dance; works of American Jewish choreographers such as Fiddler on the Roof; the Batsheva Dance Company, Ethiopian and Yemenite Jewish dance companies in Israel.
Prerequisite: upper-division standing.

Kor - Korean

Kor 101 - First-year Korean (5)
An introduction to the Korean language with emphasis on listening comprehension, speaking, elementary reading and writing, and grammatical patterns. This is the first course in a sequence of three: Kor 101, Kor 102, and Kor 103.

Kor 101H - 1st Year Korean Heritage
An introduction to the Korean language with emphasis on listening comprehension, speaking, elementary reading and writing, and grammatical patterns.

Kor 102 - First-year Korean (5)
An introduction to the Korean language with emphasis on listening comprehension, speaking, elementary reading and writing, and grammatical patterns. This is the second course in a sequence of three: Kor 101, Kor 102, and Kor 103.

Kor 102H - 1st Year Korean Heritage
An introduction to the Korean language with emphasis on listening comprehension, speaking, elementary reading and writing, and grammatical patterns.

Kor 103 - First-year Korean (5)
An introduction to the Korean language with emphasis on listening comprehension, speaking, elementary reading and writing, and grammatical patterns. This is the third course in a sequence of three: Kor 101, Kor 102, and Kor 103.

Kor 103H - 1st Year Korean Heritage
An introduction to the Korean language with emphasis on listening comprehension, speaking, elementary reading and writing, and grammatical patterns.
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**Kor 201 - Second-year Korean (S)**
Continued work in the Korean language with emphasis on listening comprehension, speaking, reading and writing, and grammatical patterns. This is the first course in a sequence of three: Kor 201, Kor 202, and Kor 203. Recommended prerequisite: Kor 103.

**Kor 201H - 2nd Year Korean Heritage**
Continued work in the Korean language with emphasis on listening comprehension, speaking, reading and writing, and grammatical patterns. This is the second course in a sequence of three: Kor 201, Kor 202, and Kor 203. Recommended prerequisite: Kor 103.

**Kor 202 - Second-year Korean (S)**
Continued work in the Korean language with emphasis on listening comprehension, speaking, reading and writing, and grammatical patterns. This is the second course in a sequence of three: Kor 201, Kor 202, and Kor 203. Recommended prerequisite: Kor 103.

**Kor 202H - 2nd Year Korean Heritage**
Continued work in the Korean language with emphasis on listening comprehension, speaking, reading and writing, and grammatical patterns. This is the second course in a sequence of three: Kor 201, Kor 202, and Kor 203. Recommended prerequisite: Kor 103.

**Kor 203 - Second-year Korean (S)**
Continued work in the Korean language with emphasis on listening comprehension, speaking, reading and writing, and grammatical patterns. This is the third course in a sequence of three: Kor 201, Kor 202, and Kor 203. Recommended prerequisite: Kor 103.

**Kor 203H - 2nd Year Korean Heritage**
Continued work in the Korean language with emphasis on listening comprehension, speaking, reading and writing, and grammatical patterns. This is the third course in a sequence of three: Kor 201, Kor 202, and Kor 203. Recommended prerequisite: Kor 103.

**Kor 299 - Special Studies (1-12)**
(Credit to be arranged.)

**Kor 301 - Third-year Korean (4)**
Continued work in the Korean language in a widening variety of contexts. 301 emphasizes listening and speaking skills; 302 reading, writing, and vocabulary development. This is the first course in a sequence of two: Kor 301 and Kor 302. Recommended prerequisite: Kor 203.

**Kor 302 - Third-year Korean (4)**
Continued work in the Korean language in a widening variety of contexts. 301 emphasizes listening and speaking skills; 302 reading, writing, and vocabulary development. This is the second course in a sequence of two: Kor 301 and Kor 302. Recommended prerequisite: Kor 203.

**Kor 330 - Topics in Korean Culture and Civilization (4)**
A multimedia survey of development and trends of Korean culture in modern Korea. Examines various forms of its culture—including rituals, traditions, art, music, cinema, entertainment, mass media, food, and the Internet—and studies their implications in social, political, historical, and economical contexts. Conducted in English.

**Kor 330U - Topics in Korean Culture and Civilization (4)**
A multimedia survey of development and trends of Korean culture in modern Korea. Examines various forms of its culture—including rituals, traditions, art, music, cinema, entertainment, mass media, food, and the Internet—and studies their implications in social, political, historical, and economical contexts. Conducted in English.

**Kor 361 - Korean Culture & Society Through Film (4)**
Introduces salient elements of traditional and contemporary Korea by means of watching and discussing selected Korean movies that offer rich cultural and historical contexts. Examines how the creators of the movies interpret and represent them in their work. Taught in English.

**Kor 399 - Special Studies (1-12)**
(Credit to be arranged.)

**Kor 399U - Special Studies (4)**
(Credit to be arranged.)

**Kor 404 - Cooperative Education/Internship (1-12)**
(Credit to be arranged.)

**Kor 409 - Practicum (1-6)**
(Credit to be arranged.)

**Kor 410 - Selected Topics (1-12)**
(Credit to be arranged.)

**Lat - Latin**

**Lat 101 - First-year Latin (4)**
An introduction to elementary Latin. Emphasis on the elements of grammar, vocabulary building, and elementary readings. This is the first course in a sequence of three: Lat 101, Lat 102, and Lat 103.

**Lat 102 - First-year Latin (4)**
An introduction to elementary Latin. Emphasis on the elements of grammar, vocabulary building, and elementary readings. This is the second course in a sequence of three: Lat 101, Lat 102, and Lat 103.

**Lat 103 - First-year Latin (4)**
An introduction to elementary Latin. Emphasis on the elements of grammar, vocabulary building, and elementary readings. This is the third course in a sequence of three: Lat 101, Lat 102, and Lat 103.

**Lat 199 - Special Studies (1-12)**
(Credit to be arranged.)

**Lat 201 - Second-year Latin (4)**
Intensive review of basic materials introduced in first-year program and further development of reading skills. This is the first course in a sequence of three: Lat 201, Lat 202, and Lat 203. Recommended prerequisite: Lat 103.

**Lat 202 - Second-year Latin (4)**
Intensive review of basic materials introduced in first-year program and further development of reading skills. This is the second course in a sequence of three: Lat 201, Lat 202, and Lat 203. Recommended prerequisite: Lat 103.
Lat 203 - Second-year Latin (4)
Intensive review of basic materials introduced in first-year program and further development of reading skills. This is the third course in a sequence of three: Lat 201, Lat 202, and Lat 203. Recommended prerequisite: Lat 103.

Lat 299 - Special Studies (1-12)
(Credit to be arranged.)

Lat 301 - Third-year Latin (2)
Survey of classical Latin syntax; extensive practice in prose composition; close study of poetic techniques. This is the first course in a sequence of three: Lat 301, Lat 302, and Lat 303. Recommended prerequisite: Lat 203.

Lat 302 - Third-year Latin (2)
Survey of classical Latin syntax; extensive practice in prose composition; close study of poetic techniques. This is the second course in a sequence of three: Lat 301, Lat 302, and Lat 303. Recommended prerequisite: Lat 203.

Lat 303 - Third-year Latin (2)
Survey of classical Latin syntax; extensive practice in prose composition; close study of poetic techniques. This is the third course in a sequence of three: Lat 301, Lat 302, and Lat 303. Recommended prerequisite: Lat 203.

Lat 330 - Roman Culture (4)
A survey of daily life in ancient Rome, including Roman families, religious practices, entertainment, political life, arts and architecture. Conducted in English.

Lat 330U - Roman Culture (4)
A survey of daily life in ancient Rome, including Roman families, religious practices, entertainment, political life, arts and architecture. Conducted in English.

Lat 341 - Roman Literature in Translation (4)
A survey of Roman literature from the Republic through the Empire, including readings in Virgil, Plautus, Ovid, Cicero, and Catullus. Conducted in English.

Lat 341U - Roman Literature in Translation (4)
A survey of Roman literature from the Republic through the Empire, including readings in Virgil, Plautus, Ovid, Cicero, and Catullus. Conducted in English.

Lat 399 - Special Studies (1-6)
(Credit to be arranged.)

Lat 401 - Research (1-6)
(Credit to be arranged.)

Lat 404 - Cooperative Education/Internship (1-12)
(Credit to be arranged.)

Lib - Library

Lib 181 - Use of the Library (3)
Initial training in the effective use of the University library and resources, such as the card catalog, reference materials, and electronic resources, including the on-line catalog, CDROM databases, and Internet.

Lib 199 - Special Studies (1-8)
Credit to be arranged.

Lib 299 - Special Studies (1-8)
Credit to be arranged.

Lib 399 - Special Studies (1-8)
Credit to be arranged.

Lib 401 - Research (1-6)
(Credit to be arranged.)

Lib 402 - Independent Study (1-12)
(Credit to be arranged.)

Lib 403 - Thesis (1-6)
(Credit to be arranged.)

Lib 404 - Cooperative Education/Internship (1-12)
(Credit to be arranged.)

Lib 405 - Reading and Conference (1-6)
(Credit to be arranged.)

Lib 406 - Special Problems (1-6)
(Credit to be arranged.)

Lib 407 - Seminar (1-6)
(Credit to be arranged.)

Lib 408 - Workshop (1-6)
(Credit to be arranged.)

Lib 409 - Practicum (1-12)
(Credit to be arranged.)

Lib 410 - Experimental Course (1-6)
(Credit to be arranged.)

Lib 428 - Children's Literature, K-5 (3)
Materials grades K-5. Traditional genres such as picture books, traditional tales, modern realism, romance, adventure, mystery, historical fiction, science fiction, fantasy, biography, poetry, and nonfiction. Study of literature that illustrates cultural diversity. Resources for selection; awards and honors. Also offered for graduate-level credit as Lib 528 and may be taken only once for credit.

Lib 429 - Young Adult Literature (3)
A survey of books and non-book materials suitable for students of junior and senior high school age. Emphasis on selection and evaluation of books, adolescent reading interests, and reading guidance for curricular and personal needs. Also offered for graduate-level credit as Lib 529 and may be taken only once for credit.

Lib 432 - Multicultural Literature K-12 (3)
An introduction to contemporary multicultural literature, fiction and nonfiction, for use with early childhood, elementary, middle school and high school students. Emphasis is on the selection, evaluation, and utilization of literature in the classroom and library media center. Also offered for graduate-level credit as Lib 532 and may be taken only once for credit.
Lib 433 - Global Literature: K-12 (3)
A survey of global literature for use with students in elementary, middle, or high school classrooms. A major focus will be on selecting reading materials and using them in the library and classroom. Also offered for graduate-level credit as Lib 533 and may be taken only once for credit.

Lib 501 - Research (1-9)
(Credit to be arranged.)

Lib 502 - Independent Study (1-12)
(Credit to be arranged.)

Lib 503 - Thesis (1-9)
(Credit to be arranged.)

Lib 504 - Cooperative Education/Internship (1-12)
(Credit to be arranged.)

Lib 505 - Reading and Conference (1-6)
(Credit to be arranged.)

Lib 506 - Special Problems (1-6)
(Credit to be arranged.)

Lib 507 - Seminar (1-6)
(Credit to be arranged.)

Lib 508 - Workshop (1-6)
(Credit to be arranged.)

Lib 509 - Practicum (1-9)
(Credit to be arranged.)

Lib 510 - Experimental Course (1-6)
(Credit to be arranged.)

Lib 528 - Children's Literature, K-5 (3)
Materials grades K-5. Traditional genres such as picture books, traditional tales, modern realism, romance, adventure, mystery, historical fiction, science fiction, fantasy, biography, poetry, and nonfiction. Study of literature that illustrates cultural diversity. Resources for selection; awards and honors. Also offered for undergraduate-level credit as Lib 428 and may be taken only once for credit.

Prerequisite: junior standing.

Lib 529 - Young Adult Literature (3)
A survey of books and non-book materials suitable for students of junior and senior high school age. Emphasis on selection and evaluation of books, adolescent reading interests, and reading guidance for curricular and personal needs. Also offered for undergraduate-level credit as Lib 429 and may be taken only once for credit.

Lib 530 - Literature Promotion Programs, K-12 (3)
A study of techniques for promoting literature in elementary and secondary schools: author/illustrator studies, reading books aloud, storytelling, booktalks, reading promotion programs, and incorporating literature throughout the curriculum.

Prerequisite: Lib 428/528.

Lib 532 - Multicultural Literature K-12 (3)
An introduction to contemporary multicultural literature, fiction and nonfiction, for use with early childhood, elementary, middle school and high school students. Emphasis is on the selection, evaluation, and utilization of literature in the classroom and library media center. Also offered for undergraduate-level credit as Lib 432 and may be taken only once for credit.

Lib 533 - Global Literature: K-12 (3)
A survey of global literature for use with students in elementary, middle, or high school classrooms. A major focus will be on selecting reading materials and using them in the library and classroom. Also offered for undergraduate-level credit as Lib 433 and may be taken only once for credit.

Lib 534 - Administration of the School Library (3)
Study of the school library and its integral role in the instructional program of the school and the school library media movement. Focus on the leadership role of the school librarian, management of personnel, program budgeting, facility planning, role of state and national standards in planning, evaluation, and development; other administrative areas. Field activities included.

Prerequisite: Lib 528.

Lib 536 - Instructional Design and Technology for Schools & Libraries (3)
Study the use of instructional media for K-12 including instructional design and criteria for quality print and non-print media. Learn graphic techniques and uses of computers and technology in production of instructional media. Research current practices in library and classroom instruction and communication.

Lib 541 - Reference and Information Systems and Services (3)
An analysis of reference services and procedures. Study of print, nonprint, and electronic database reference sources to include bibliographic tools, indexes, encyclopedias, ready references, biographical tools, geographical tools, dictionaries, government documents, and specialized materials. Research in reference services and technological delivery systems.

Prerequisite: Lib 428/528.

Lib 542 - Collection Development and Evaluation (3)
Principles and practice of evaluation, selection, and acquisition of all types of materials included in a school library collection. Selection and collection development policies and procedures. Study of professional evaluation and selection sources. Field activities included.

Prerequisite: Lib 428 or Lib 528.

Lib 547 - School Library Instructional Programs, K-12 (3)
A study of the K-12 information skills program, including the development of a scope and sequence, effective teaching strategies, specific skills instruction, correlation and integration with the classroom curriculum, and organization and development of a teaching program in the school library media center.

Prerequisite: Lib 528.

Lib 548 - Cataloging and Organization of School Library Collections (3)
Principles of organization of school library collections. Basic cataloging procedures for print, nonprint, and electronic forms of media using standard cataloging and classification codes. Application of online cataloging databases.

Prerequisite: Lib 428/528.

Lib 554 - Student Teaching I (6)
Beginning student teaching in a library media center under the direction of a supervising library media teaching and university supervisor. Observation and participation in teaching, administrative and
other responsibilities of a library media specialist. Opportunities for involvement in student learning activities, development of teaching skills, basic skills in management and discipline of students.

**Prerequisite:** admission to the program and approved application.

**Lib 555 - Student Teaching II (15)**

Ten weeks of full-time student teaching in a school library media center under the supervision of a library media teacher and university supervisor. Participation in a full range of teaching, administrative, and other responsibilities of a library media specialist. Direct responsibilities for student learning activities, development of teaching skills, creating a climate conducive for learning; management and discipline of students, and related professional activities. Weekly seminar.

**Prerequisite:** admission to program and approved application.

**Lib 561 - School Library Practicum: Elementary (3)**

A planned experience consisting of practical application of the full range of roles and responsibilities of the School Librarian in an elementary school library under the direction of a supervising elementary school library teacher and a University supervisor.

**Prerequisite:** admission to Educational Media Endorsement Program.

**Lib 562 - School Library Practicum: Secondary (3)**

A planned experience consisting of practical application of the full range of roles and responsibilities of the School Librarian in a secondary school library under the direction of a supervising secondary school library teacher and a University supervisor.

**Prerequisite:** admission to the School Library Endorsement Program.

**Lib 573 - Advanced Methods and Procedures in School Library/Media Centers (3)**

A study of the school library/media center as a teaching agency. Designed to focus on the teaching role of the school librarian/media specialist in presenting concepts, principles, content, and techniques to students and teachers. Emphasis placed on instruction in library and research skills; reading, viewing and listening guidance; in-service for school personnel; and problems involved in performing effectively as a teacher. Observation of library/media centers required.

**Prerequisite:** Educational Media Endorsement or consent of instructor.

**Lib 574 - Research Strategies for Library Media Specialists (3)**

Advanced reference materials available in school and academic libraries, including computer databases and network resources.

**Prerequisite:** Educational Media Endorsement or consent of instructor.

**Lib 575 - Directed Field Experience (3)**

Planned contact for school library media specialists with professional librarians and/or media specialists in public, academic, special libraries, information centers, and other library or media-related settings. Directed field work and visitations to various libraries and information centers will be the emphasis of the course. Seminar meetings on campus deal with topics related to the field experience as well as intensive study of related advanced issues such as automation, personnel, and management.

**Prerequisite:** Educational Media Endorsement or consent of instructor.

**Lib 576 - Planning and Evaluation of Library Media Programs (3)**

Analysis of media center programs and planning techniques; study and application of media center evaluation instruments; analysis and development of library media center programs.

**Prerequisite:** Educational Media Endorsement or consent of instructor.

**Lib 577 - Video Production (3)**

Study and practice video production techniques, including storyboarding, camera techniques, editing, and preparing video for various educational settings. Design activities that engage students in digital video production and produce videos for library or classroom use.

**Lib 588 - 21st Century Technologies for Educators (3)**

Analyze the role of computers and advanced technology in the library media center and classroom. Focus on new and emerging technologies to enhance classroom instruction for all learners. Develop curricula that effectively use media and technology to engage and support students.

**Lib 589 - Creative Photography in Education (3)**

A study of photographic processes to include photography without a camera, basic animation techniques, and darkroom techniques. Analysis of completed photographs in terms of composition, style, and technique will also be studied. All techniques will be related to classroom instruction in the elementary and secondary schools.

**Prerequisite:** Lib 536 or consent of instructor.

**Lib 592 - Contemporary Children's and Young Adult Literature (3)**

An analysis and study of contemporary children's and young adult literature. A study of trends and styles in modern literature. Includes picture books, fiction, and nonfiction. Contemporary authors and illustrators featured.

**Prerequisite:** Lib 428/528 or equivalent.

**Lib 601 - Research (1-9)**

(Credit to be arranged.)

**Lib 602 - Independent Study (1-9)**

(Credit to be arranged.)

**Lib 603 - Dissertation (1-9)**

(Credit to be arranged.)

**Lib 604 - Cooperative Education/Internship (1-9)**

(Credit to be arranged.)

**Lib 605 - Reading and Conference (1-9)**

(Credit to be arranged.)

**Lib 606 - Special Problems (1-9)**

(Credit to be arranged.)

**Lib 607 - Seminar (1-9)**

(Credit to be arranged.)

**Lib 608 - Workshop (1-9)**

(Credit to be arranged.)

**Lib 609 - Practicum (1-9)**

(Credit to be arranged.)
Lib 610 - Selected Topics (1-9)  
(Credit to be arranged.)
Lib 801 - Research (0-9)  
(Credit to be arranged.)
Lib 802 - Independent Study (0-9)  
(Credit to be arranged.)
Lib 804 - Cooperative Education/Internship (0-9)  
(Credit to be arranged.)
Lib 805 - Reading and Conference (0-9)  
(Credit to be arranged.)
Lib 806 - Special Problems (0-9)  
(Credit to be arranged.)
Lib 807 - Seminar (0-9)  
(Credit to be arranged.)
Lib 808 - Workshop (0-9)  
(Credit to be arranged.)
Lib 809 - Practicum (0-9)  
(Credit to be arranged.)
Lib 810 - Experimental Course (0-9)  
(Credit to be arranged.)
Ling - Applied Linguistics
Ling 100 - Grammar/Writing Level I (Low Beginning) (3)
An introduction to basic reading skills including basic comprehension, prerequisite reading, skimming, and scanning; guessing meaning from context; finding main ideas; differentiating between fact and opinion. Introduction to basic dictionary skills; main idea vs. supporting details. Emphasis on building vocabulary and reading for basic understanding.
Ling 103 - Reading Level I (Low Beginning) (3)
An introduction to basic reading skills including basic comprehension, prerequisite reading, skimming, and scanning; guessing meaning from context; finding main ideas; differentiating between fact and opinion. Introduction to basic dictionary skills; main idea vs. supporting details. Emphasis on building vocabulary and reading for basic understanding.
Ling 104 - Pre-Entry Program Reading (6)
An introduction to basic reading skills including phonics, basic comprehension, fluency, sequence, word analysis; finding the topic. Introduction to basic dictionary skills and extensive reading. Emphasis on building vocabulary and decoding strategies to aid in fluency and reading for basic understanding.
Ling 106 - Pre-Entry Program Speaking/Listening (4)
An introduction to basic listening and speaking skills. Practice with listening to conversations and interviews; asking/answering questions; making positive and negative statements in the present tenses; describing people, places, things and activities; giving personal information, expressing wants, needs and likes. Emphasis is on pronunciation and understanding and being under-stood in simple conversational situations.
Ling 107 - Seminar (0-9)  
(Credit to be arranged.)
Ling 108 - Workshop (0-9)  
(Credit to be arranged.)
Ling 100A - Pre-Entry Program Grammar/Writing (8)
An introduction to form, meaning and use of simple verb tenses; use of and, but, so, because, if, simple present, present continuous, simple past, future (be going to) verb tenses; use of should, must, can, can’t; subject, object, possessive, demonstrative pronouns. Students will learn to identify parts of speech and sentences and write cohesive, coherent paragraphs; understand and use the basic rules for capitalization, punctuation and spelling; practice good penmanship.
Ling 101 - Pre-Entry Program Grammar/Writing (8)
An introduction to form, meaning and use of simple present and past verb tenses; conjunctions; subject, object, possessive, and demonstrative pronouns. Students will learn to identify parts of speech and sentences; question/answer formation; write beginning level paragraphs; understand and use the basic rules for capitalization, punctuation and spelling; practice good penmanship.
Ling 102 - Special Problems (0-9)  
(Credit to be arranged.)
Ling 103 - Reading Level I (Low Beginning) (3)
An introduction to basic reading skills including basic comprehension, prerequisite reading, skimming, and scanning; guessing meaning from context; finding main ideas; differentiating between fact and opinion. Introduction to basic dictionary skills; main idea vs. supporting details. Emphasis on building vocabulary and reading for basic understanding.
Ling 104 - Pre-Entry Program Reading (6)
An introduction to basic reading skills including phonics, basic comprehension, fluency, sequence, word analysis; finding the topic. Introduction to basic dictionary skills and extensive reading. Emphasis on building vocabulary and decoding strategies to aid in fluency and reading for basic understanding.
Ling 106 - Pre-Entry Program Speaking/Listening (4)
An introduction to basic listening and speaking skills. Practice with listening to conversations and interviews; asking/answering questions; making positive and negative statements in the present tenses; describing people, places, things and activities; giving personal information, expressing wants, needs and likes. Emphasis is on pronunciation and understanding and being under-stood in simple conversational situations.
Ling 107 - Seminar (0-9)  
(Credit to be arranged.)
Ling 108 - Workshop (0-9)  
(Credit to be arranged.)
Ling 100A - Pre-Entry Program Grammar/Writing (8)
An introduction to form, meaning and use of simple verb tenses; use of and, but, so, because, if, simple present, present continuous, simple past, future (be going to) verb tenses; use of should, must, can, can’t; subject, object, possessive, demonstrative pronouns. Students will learn to identify parts of speech and sentences and write cohesive, coherent paragraphs; understand and use the basic rules for capitalization, punctuation and spelling; practice good penmanship.
Ling 101 - Pre-Entry Program Grammar/Writing (8)
An introduction to form, meaning and use of simple present and past verb tenses; conjunctions; subject, object, possessive, and demonstrative pronouns. Students will learn to identify parts of speech and sentences; question/answer formation; write beginning level paragraphs; understand and use the basic rules for capitalization, punctuation and spelling; practice good penmanship.
Ling 100A - Pre-Entry Program Grammar/Writing (8)
An introduction to form, meaning and use of simple verb tenses; use of and, but, so, because, if, simple present, present continuous, simple past, future (be going to) verb tenses; use of should, must, can, can’t; subject, object, possessive, demonstrative pronouns. Students will learn to identify parts of speech and sentences and write cohesive, coherent paragraphs; understand and use the basic rules for capitalization, punctuation and spelling; practice good penmanship.
Ling 101 - Pre-Entry Program Grammar/Writing (8)
An introduction to form, meaning and use of simple present and past verb tenses; conjunctions; subject, object, possessive, and demonstrative pronouns. Students will learn to identify parts of speech and sentences; question/answer formation; write beginning level paragraphs; understand and use the basic rules for capitalization, punctuation and spelling; practice good penmanship.
Ling 103 - Reading Level I (Low Beginning) (3)
An introduction to basic reading skills including basic comprehension, prerequisite reading, skimming, and scanning; guessing meaning from context; finding main ideas; differentiating between fact and opinion. Introduction to basic dictionary skills; main idea vs. supporting details. Emphasis on building vocabulary and reading for basic understanding.
Ling 104 - Pre-Entry Program Reading (6)
An introduction to basic reading skills including phonics, basic comprehension, fluency, sequence, word analysis; finding the topic. Introduction to basic dictionary skills and extensive reading. Emphasis on building vocabulary and decoding strategies to aid in fluency and reading for basic understanding.
Ling 106 - Pre-Entry Program Speaking/Listening (4)
An introduction to basic listening and speaking skills. Practice with listening to conversations and interviews; asking/answering questions; making positive and negative statements in the present tenses; describing people, places, things and activities; giving personal information, expressing wants, needs and likes. Emphasis is on pronunciation and understanding and being under-stood in simple conversational situations.
Ling 107 - Seminar (0-9)  
(Credit to be arranged.)
Ling 108 - Workshop (0-9)  
(Credit to be arranged.)
Ling 100A - Pre-Entry Program Grammar/Writing (8)
An introduction to form, meaning and use of simple verb tenses; use of and, but, so, because, if, simple present, present continuous, simple past, future (be going to) verb tenses; use of should, must, can, can’t; subject, object, possessive, demonstrative pronouns. Students will learn to identify parts of speech and sentences and write cohesive, coherent paragraphs; understand and use the basic rules for capitalization, punctuation and spelling; practice good penmanship.
Ling 101 - Pre-Entry Program Grammar/Writing (8)
An introduction to form, meaning and use of simple present and past verb tenses; conjunctions; subject, object, possessive, and demonstrative pronouns. Students will learn to identify parts of speech and sentences; question/answer formation; write beginning level paragraphs; understand and use the basic rules for capitalization, punctuation and spelling; practice good penmanship.
Ling 103 - Reading Level I (Low Beginning) (3)
An introduction to basic reading skills including basic comprehension, prerequisite reading, skimming, and scanning; guessing meaning from context; finding main ideas; differentiating between fact and opinion. Introduction to basic dictionary skills; main idea vs. supporting details. Emphasis on building vocabulary and reading for basic understanding.
Ling 104 - Pre-Entry Program Reading (6)
An introduction to basic reading skills including phonics, basic comprehension, fluency, sequence, word analysis; finding the topic. Introduction to basic dictionary skills and extensive reading. Emphasis on building vocabulary and decoding strategies to aid in fluency and reading for basic understanding.
Ling 106 - Pre-Entry Program Speaking/Listening (4)
An introduction to basic listening and speaking skills. Practice with listening to conversations and interviews; asking/answering questions; making positive and negative statements in the present tenses; describing people, places, things and activities; giving personal information, expressing wants, needs and likes. Emphasis is on pronunciation and understanding and being under-stood in simple conversational situations.
Ling 111 - Grammar/Writing Level 1 (8)
Continued focus on sentence structure and developing basic single paragraphs (descriptive and narrative rhetorical styles) with topic, supporting, and concluding sentences. Introduction to compound and complex sentences. A continued focus on simple present and past verbs, and an introduction to form, meaning, and use of progressive and future tense, including statement and question forms; contractions; time expressions; modals; count/noncount nouns; pronouns; adjective and noun complements; demonstratives; and prepositions.
Ling 113 - Reading Level E (High Beginning) (3)
Focus on basic reading skills, including skimming and scanning, differentiating main ideas from supporting details and examples, identifying common prefixes and suffixes, and figuring out the meaning of words from context clues. Dictionary exercises used to practice alphabetical order, syllabification, and word stress. Emphasis on reading short, adapted materials.
Ling 114 - Reading Level 1 (4)
Continued focus on basic reading skills, as well as introduction to skimming and scanning, differentiating main ideas from supporting details and examples, identifying common prefixes and suffixes, discerning meaning from context, and matching pronouns to their referents. Dictionary exercises used to practice alphabetical order, syllabification, and word stress. Continued emphasis on building vocabulary and honing skills through reading short, adapted materials.
Ling 115 - Writing Workshop for Non-native Writers (4)
Designed for writers whose first language is not English to develop their skills and confidence in writing for college. Focuses on the rhetorical structures of American College-level academic writing including essay structure, summaries, responses, and research writing. In addition, students work on grammar and sentence structure problems which occur more often in non-native writing and do peer editing and self-editing. Understanding complex assignments, synthesizing ideas, and strategies for test taking are also addressed.
Ling 116 - Speaking/Listening Level 1 (4)
Continued emphasis is on developing confidence, comprehensibility, and skills in basic social interactions, including participating in conversations, asking for information, and providing personal information. Practice questions, statements, and negatives in present, past, and future tenses; identify common reductions, stress, and intonation patterns; use vocabulary related to academic and everyday life; give narrative and descriptive individual presentations.
Ling 120 - Grammar/Writing Level 2 (Low-Intermediate) (3)
Focus on paragraph development, with work on introduction, body and conclusion for a short essay. Review of narrative and descriptive rhetorical styles and verb forms
introduced in Level E. Introduction to process, comparison/ contrast, and classification as rhetorical styles; use of logical connectors for addition and contrast; outlining ideas for essay organization. An introduction to present perfect tense, modal auxiliaries, gerunds and infinitives, passive voice, real conditions, and comparative and superlative forms of adjectives and adverbs. Emphasis on expanding single paragraph essays into short essays of three or more paragraphs using correct form, meaning and use of all new and reviewed structures.

Ling 121 - Grammar/Writing Level 2 (low-intermediate) (8)
Focus on paragraph development and introduction to process, comparison/contrast, and classification writing as rhetorical styles; use of logical connectors; outlining ideas for essay organization; and formatting rules. Emphasis on expanding single paragraph essays into longer essays. Expanded utilization of modal auxiliaries and introduction to present perfect tense, gerunds and infinitives, passive voice, real conditional, comparative and superlative adjectives, and adverbs.

Ling 123 - Reading Level 2 (Low-intermediate) (3)
Focus on improving comprehension skills and reading speed. Introduction to locating main ideas, identifying word forms, using a dictionary to choose correct meaning, and inferring ideas in a passage. Emphasis is on reading both fiction and non-fiction.

Ling 124 - Reading Level 2 (low-intermediate) (4)
Focus, in both fiction and non-fiction texts, on improving comprehension skills; locating and understanding main ideas, supporting details, and signal words; inferring meaning; and increasing reading speed. Improve dictionary skills and expand academic vocabulary knowledge including meaning, parts of speech, affixes, and word forms.

Ling 126 - Speaking/Listening Level 2 (low-intermediate) (4)
Identify meaningful information from short lectures and conversations; practice with question forms in present, past, future, and present perfect tenses; conduct interviews; plan and deliver short oral presentations. Continued improvement of pronunciation skills, including stress, intonation, and reductions.

Ling 130 - Grammar/Writing Level 3 (Intermediate) (3)
Review of rhetorical patterns and verb forms from previous levels, rules of essay formatting. Introduction to cause/effect, and argumentation as rhetorical styles; practice narrowing a topic, developing more effective introductions and conclusions; and use of transitions to subordinate-coordinate ideas. An introduction to past perfect and future perfect tenses, past modal auxiliaries, subordinate clauses, reported speech, parallel structure and relative clauses. Emphasis on expanding essays to five or more paragraphs while developing effective introductory and concluding paragraphs and transitional elements.

Ling 131 - Grammar/Writing Level 3 (Intermediate) (8)
Introduction to cause/effect and argumentation as rhetorical styles; practice narrowing a topic, developing more effective introductions and conclusions; use of transitions to subordinate-coordinate ideas. Emphasis on essay writing. Expanded use of gerunds and infinitives, modal auxiliaries, and adverbial clauses. Introduction to past perfect and future perfect tenses, subordinate clauses, parallel structure, and relative clauses.

Ling 133 - Reading Level 3 (Intermediate) (3)
Focus on developing critical reading skills and analyzing short original texts. Students are introduced to rhetorical patterns in texts, distinguishing fact from opinion in a passage, paraphrasing and summarizing points in a reading, and identifying features of longer works of fiction. Emphasis on reading short original passages of an academic nature and a short novel.

Ling 134 - Reading Level 3 (intermediate) (4)
Focus on developing critical reading skills and analyzing expanded works of fiction and non-fiction; introduction to rhetorical patterns, distinguishing fact from opinion, determining author’s purpose, paraphrasing and summarizing points, and identifying elements of fiction. Expansion and use of academic vocabulary.

Ling 136 - Speaking/Listening Level 3 (Intermediate) (4)
Emphasis on taking organized notes using symbols and abbreviations, understanding main ideas and examples, and identifying lecture cues from academic lectures. Improve skills needed for focused small group discussions, impromptu speaking, and individual and group presentations using information gathered from interviews.

Ling 141 - Grammar Level 4 (Upper-intermediate) (3)
A review of entire verb tense system and subordinate clauses; an introduction to reduced forms of subordinate clauses, perfective forms of gerunds and infinitives, unreal conditions, causative verbs, and adjective/noun complements. Emphasis is on incorporating correct usage in written assignments, including paraphrases and summaries.

Ling 142 - Grammar Level 4 (upper-intermediate) (4)
A review of entire verb tense system and subordinate clauses; an introduction to reduced forms of subordinate clauses, perfective forms of gerunds and infinitives, unreal conditions, causative verbs, and adjective/noun complements. Emphasis is on incorporating correct usage in written assignments, including paraphrases and summaries.

Ling 143 - Writing Level 4 (upper-intermediate) (4)
Focus on writing a short source paper. Review of rules for essay formatting, use of transitional elements, development of effective introductions and conclusions. Introduction to analysis and synthesis as rhetorical styles; process of writing a short resource paper, including MLA or APA documentation style, process of selecting and narrowing a topic, and incorporating citations. Emphasis is on using sources provided by instructor to develop a short resource paper using correct documentation style.

Ling 144 - Reading Level 4 (upper-intermediate) (4)
Focus on textual analysis and comprehension skills in academic passages. Introduction to concepts of author’s point of view, audience, and purpose in reading selections; predicting possible examination
questions related to readings; answering essay questions under time constraints. Emphasis is on reading passages from academic texts and a novel.

**Ling 147 - Understanding Academic Lectures (4)**

Students prepare for the demands of understanding academic lectures in university contexts. Focus in on developing skills and strategies to increase effective lecture listening, note-taking, and retrieval and application of information.

**Ling 151 - Grammar Level 5 (Advanced) (3)**

A quick review and expansion of perfective verb forms, subordination/coordination of structures, and conditionals; an introduction to subjunctive, fronting and inversion of structures. Emphasis is on usage, particularly in editing, academic writing and oral presentations.

**Ling 152 - Grammar Level 5 (advanced) (4)**

A quick review and expansion of perfective verb forms, subordination/coordination of structures, and conditionals; an introduction to subjunctive, fronting and inversion of structures. Emphasis is on usage, particularly in editing, academic writing and oral presentations.

**Ling 153 - Writing Level 5 (advanced) (4)**

Focus on writing a multi-page research paper. Review of essay form, research process, including selecting and narrowing topic, note-taking, summarizing and paraphrasing material, using documentation style. Introduction to material collection from library and primary sources, development of a bibliography, and use of library data bases for research. Emphasis on locating and selecting appropriate sources to use in writing a multi-page research paper that demonstrates sophistication of thought process and mastery of expository writing techniques.

**Ling 154 - Reading Level 5 (advanced) (4)**

Focus on expanding critical thinking skills introduced in earlier levels, including determining author’s point of view and tone, distinguishing fact from opinion, inferring information from textual cues, and predicting possible examination questions about readings. Emphasis is on reading unabridged academic passages and a full-length novel.

**Ling 155 - Discussion Skills for Non-native Speakers (4)**

Focus on communication skills within the context of small group settings. Development of effective group collaboration and communication strategies including oral expression, active listening, discussion roles, and cultural competency. Students practice skills through participation in group projects.

**Ling 156 - Speaking/Listening Level 5 (advanced) (4)**

Focus on topics related to global issues. Further expansion of note-taking skills in full-length classroom and taped lectures; active participation in small group discussions, producing written summaries of individual and group progress; preparation and delivery of small group and individual oral presentations related to global issues that demonstrate evidence of research and organizational cues/translations; use of visual aids, including those developed from software programs. Emphasis is on using research to develop and support ideas in discussions and presentations.

**Ling 161 - Language Proficiency Test Preparation (4)**

This course prepares students to take IELTS, TOEFL iBT, or the Institutional TOEFL. Students select and set goals to achieve their desired test score. Students follow a flexible, personalized study plan to improve weaknesses while enhancing overall performance. Students make use of multiple learning tools available in the IELP Learning Center, consult with trained testing tutors, and work closely with the instructor.

**Ling 170 - Skills Enhancement (1-12)**

A variety of classes aimed at learning English in a variety of manners, i.e. English through Drama, Pronunciation, Vocabulary Building, just to name a few. Course selection varies on a quarterly basis.

**Ling 182 - Social Media: Interacting Online (4)**

Students develop computer communication skills by examining and researching the social aspect of the Internet. Explore and examine the use of social media and its importance in society. Participate in weekly online discussions and create individual blogs.

**Ling 183 - Community Reporting (4)**

Students explore American culture at PSU and in the Portland community by creating a class newsletter. Focus on interviewing and reporting techniques, writing and revising articles, and developing proofreading and editing skills. Students select articles and design the layout.

**Ling 184 - Cultural Themes in Reading (4)**

Students develop reading skills, cultural knowledge, and communicative ability by reading and discussing authentic, unabridged texts. Improve critical thinking and discussion skills through writing and answering questions, paraphrasing and relating ideas, and delivering presentations. Cultural themes rotate each term.

**Ling 185 - Practically Speaking: Conversational English (4)**

Students improve conversational fluency by learning strategies for oral communication and focusing on common words and phrases used in spoken American English. Learn about the cultural knowledge required to navigate everyday interactions. Improve pronunciation and practice speaking in authentic situations.

**Ling 186 - Communication through Volunteering (4)**

This course provides community and classroom opportunities for the development of oral communication skills, critical thinking, and intercultural competence. Experience Portland culture and practice communication strategies through group projects with PSU students, elementary schools, and other community partners.

**Ling 187 - Multimedia Listening (4)**

Students expand their listening skills and increase their familiarity with American culture through a wide variety of sources such as music, movies, TV shows, Internet videos, radio programs, extended conversations, and live entertainment. Cultural themes rotate each term.

**Ling 199 - Special Studies (0-12)**

See department for course description. (Credit to be arranged.)
Ling 232 - Language and Society (4)
General introduction to what languages are like, how they are used and how they vary, focusing on how language interacts with society and culture. Some questions that will be addressed include: Why doesn’t everyone speak the same language? Do men and women talk differently? What is the relationship between endangered species and endangered languages? How does language influence our thoughts or behaviors?

Ling 233 - Language and Mind (4)
General introduction to what languages are like, how they are used, and how they vary, focusing on how language is learned and produced. Some questions that will be addressed include: Is language innate? Is it unique to humans? How is language related to thought or to culture? How is language represented in the brain? How is language acquired in different cultures and different circumstances?

Ling 299 - Special Studies (1-4)
See department for course description. (Credit to be arranged.)

Ling 301 - Introduction to Native American Languages (4)
General introduction to the linguistic and cultural background of endangered native languages of North America. Topics include structure of native languages; relationship of language to other aspects of culture such as worldview, social organization, and story telling; history of language change and current tribal projects to revitalize native languages.

Ling 390 - Introduction to Linguistics (4)
A general introduction to the study of linguistics, including a basic survey of phonology, morphology, syntax, and semantics, brief overview of other topics such as language acquisition and language in social contexts, a brief sketch placing English in historical perspective, and a preliminary examination of principles in modern language study.

Ling 391 - Introduction to Applied Linguistics (4)
Survey of topics not covered in detail in Ling 390 including language acquisition, historical linguistics and discourse analysis. Different theoretical perspectives relevant for applied linguistics are introduced and students develop their analytic skills with a special focus on the effective and discipline-appropriate reporting of these analyses.

Prerequisite: Ling 390.

Ling 392 - Structure of the English Language (4)
A study of basic English grammar with an emphasis on describing grammatical forms and their functions in communication. Expected preparation or co-requisite: Ling 390.

Ling 399 - Special Studies (1-8)
See department for course description. (Credit to be arranged.)

Ling 401 - Research (1-6)
See department for course description. (Credit to be arranged.)

Ling 404 - Cooperative Education/Internship (1-12)
See department for course description. (Credit to be arranged.)

Ling 405 - Reading and Conference (1-6)
See department for course description. (Credit to be arranged.)

Ling 406 - Special Projects (1-6)
(Credit to be arranged.)

Ling 407 - Seminar (1-6)
The Senior Seminar, draws together the Applied Linguistics major’s various strands and exploits the undergraduate student’s linguistic knowledge to explore substantive issues in the field. The course content will vary from quarter to quarter and has included such topics as “Orality and Literacy”, “Critical Linguistics”, and “Language in Cyberspace”. In addition, students will be guided in preparing résumés and CVs for graduate school or jobs. Those students planning on going to graduate school are advised to take the course in Fall Quarter.

Prerequisite: 24 Ling credits at the 400-level or senior standing or with instructor’s permission.

Ling 408 - Workshop (1-6)
See department for course description. (Credit to be arranged.)

Ling 409 - Practicum (1-12)
See department for course description. (Credit to be arranged.)

Ling 410 - Selected Topics (1-6)
See department for course description. (Credit to be arranged.)

Ling 411 - Syntax (4)
Introduction to modern grammatical theory, its methods, and findings. Presents patterns of argumentation, models, and basic results of research. Also offered for graduate-level credit as Ling 511 and may be taken only once for credit.

Prerequisite: Ling 390 and one other course in linguistics.

Ling 412 - Phonology (4)
How sounds pattern and how they are used in the world’s languages, how those patterns should be represented, and what theories have been advanced to explain those patterns. Some historical background to the sub-discipline and some training in linguistic analysis and argumentation.

Prerequisite: Ling 390 and Ling 415/Ling 515.TESOL program.

Ling 414 - Linguistic Pragmatics (4)
A study of current theories of language use, particularly contextual and functional aspects of communication. Also offered for graduate-level credit as Ling 514 and may be taken only once for credit.

Prerequisite: Ling 390. Strongly recommended: Ling 391.

Ling 415 - Linguistic Phonetics (4)
Introduces the sounds of the world’s languages with a concentration on English. Practical exercises designed to develop skills in production, discrimination, and phonetic transcription. Applications to speech technology and speech pathology. Also offered for graduate-level credit as Ling 515 and may be taken only once for credit.

Prerequisite: Ling 390 or concurrent enrollment.

Ling 416 - Discourse Analysis (4)
The examination of forms and functions in discourse. Using several analytic procedures for understanding how conversation works, especially as applied to language learning.
and teaching. Also offered for graduate-level credit as Ling 516 and may be taken only once for credit.

Prerequisite: Ling 390. Strongly recommended: Ling 391, Ling 392.

**Ling 417 - Maintenance and Revitalization of Endangered Languages (4)**

General introduction to endangered language revitalization, with a focus on native languages of the Pacific Northwest. Topics include history of attempts to eradicate native languages and the effects on those languages and their communities; theoretical basis for revitalization; emerging tribal policies; and relations between linguists and native communities. Also offered for graduate-level credit as Ling 517 and may be taken only once for credit.

**Ling 418 - Linguistic Morphology (4)**

The study of words and word structure. Focuses on analyzing word formation across languages. Examines the relationship between morphology, syntax and phonology, the theoretical assumptions that underlie morphological analysis, and some applications of morphological analysis. Also offered for graduate-level credit as Ling 518 and may be taken only once for credit.

Prerequisite: Ling 390. Strongly recommended: Ling 392.

**Ling 419 - Language Typology (4)**

Studies and classifies languages according to their structural features. Introduces (structural) linguistics and studies structures across languages. Prepares students for more theoretical and analytical courses in the department. Also offered for graduate-level credit as Ling 519 and may be taken only once for credit.

Prerequisite: Ling 390. Strongly recommended: Ling 391, Ling 392.

**Ling 420 - Historical and Comparative Linguistics (4)**

Study of language relationships and language change. Topics include the genetic classification of languages, language and prehistory, methods of historical reconstruction, and language contact. Also offered for graduate-level credit as Ling 520 and may be taken only once for credit.

Prerequisite: Ling 390. Strongly recommended: Ling 391.

**Ling 432 - Sociolinguistics (4)**

Examines the role of language in society and how social factors can influence language. The social issues around language including language policy and language ideology. Also offered for graduate-level credit as Ling 532 and may be taken only once for credit.

Prerequisite: Ling 390. Strongly recommended: Ling 391.

**Ling 433 - Psycholinguistics (4)**

A survey of psycholinguistics and the psychology of language, focusing on the general question of the relation between human language and human beings. Also offered for graduate-level credit as Ling 533 and may be taken only once for credit.

Prerequisite: Ling 390. Strongly recommended: Ling 391.

**Ling 435 - Theories and Practice in Applied Linguistics (4)**

An examination of current areas of applied linguistics research focusing on original research and building upon concepts presented in Ling 390 and Ling 391. Also offered for graduate-level credit as Ling 535 and may be taken only once for credit.

Prerequisite: Ling 390 and Ling 391.

**Ling 437 - First Language Acquisition (4)**

Introduction to main aspects of first language acquisition in childhood, from infancy to the early school years. Examines comprehension and production of the structural and social aspects of language. Includes discussion of language acquisition theories from linguistic, psycholinguistic and sociolinguistic perspectives. Research project based on collection and analysis of child language data required. Also offered for graduate-level credit as Ling 537 and may be taken only once for credit.

Prerequisite: Ling 390. Strongly recommended: Ling 391.

**Ling 438 - Second Language Acquisition (4)**

Introduction to main aspects of second language acquisition from sociolinguistic and psycholinguistic perspectives. Examines comprehension and production, stages in acquisition, cognitive processes, linguistic environment, individual variables, relationship between first and second language. Research project based on collection and analysis of language-learner language. Also offered for graduate-level credit as Ling 538 and may be taken only once for credit.

Prerequisite: Ling 390. Strongly recommended: Ling 392, Ling 391.

**Ling 439 - Language Assessment (4)**

Theoretical background and practical considerations in the conduct of language assessment. Students will explore traditional, quantitative methods as well as alternative, qualitative methods for systematically gathering information to inform decisions about individual language ability. Also offered for graduate-level credit as Ling 539 and may be taken only once for credit.

Prerequisite: Ling 390; Ling 477.

**Ling 445 - Linguistics and Cognitive Science (4)**

Presents current developments in linguistic theory, and in psychological theories of perception, cognition, and information processing (with special focus on language processing). Examines the fusion of linguistic and psychological theories into the rapidly growing field of cognitive science. Also offered for graduate-level credit as Ling 545 and may be taken only once for credit.

Prerequisite: Ling 390. Strongly recommended: Ling 391.

**Ling 453 - Graduate Preparation: Research and Writing for Non-Native Speakers (4)**

Students refine their academic writing skills through research and citation. The course also focuses on recognizing and producing vocabulary and grammar appropriate to graduate-level writing.

Prerequisite: upper-division standing and IELP program approval.

**Ling 454 - Graduate Preparation: Reading Strategies for Non-Native Speakers (4)**

In this hybrid course, students explore readings in their individual disciplines and develop a portfolio of academic skills and strategies to prepare for graduate-level reading. Students utilize technology to organize and manage readings, cite sources, and expand academic vocabulary.
Prerequisite: upper-division standing and IELP program approval.

**Ling 456 - Graduate Preparation: Oral Communication for Non-Native Speakers (4)**

Students prepare for the demands of graduate-level coursework by activating their skills through public speaking and group discussion. Emphasis is also on expanding interpersonal language skills and cross-cultural skills in an academic environment.

Prerequisite: upper-division standing and IELP program approval.

**Ling 470 - Grammar for TESOL (4)**

A study of how to teach difficult grammatical structures in English, how to resolve problems and questions that frequently arise in the ESL classroom, and how to adapt and supplement ESL grammar tests. Also offered for graduate-level credit as Ling 570 and may be taken only once for credit.

Prerequisite: Ling 392 or Ling 492 or departmental grammar test.

**Ling 471 - Understanding the International Experience (4)**

Examination of communication-based dimensions of an international or intercultural experience, including teaching English to speakers of other languages. Development of strategies and activities required to meet the challenges of teaching, working, or doing research in an international/intercultural setting. All linguistics students must register for Ling 471/571, however, this course is also offered as Intl 471 and 851 471. Also offered for graduate-level credit as Ling 571 and this course may be taken only once for credit. May be taken concurrently with Ling 390.

**Ling 472 - Teaching Pronunciation (4)**

This is a practical, hands-on course in which students apply phonetics and phonology in the context of language education. While the focus is on teaching English pronunciation, the course includes general theory and applications that are useful for students planning to teach pronunciation of other languages (e.g., Spanish, Chinese). Also offered for graduate-level credit as Ling 572 and may be taken only once for credit.

Prerequisite: Ling 390.

**Ling 473 - Computer Assisted Language Learning (4)**

Introduction to the use of computers in language learning. Examines the research of the field to inform practical considerations for task design and evaluation. Also offered for graduate-level credit as Ling 573 and may be taken only once for credit.

Prerequisite: Ling 477/577.

**Ling 475 - Curriculum Design and Materials Development in TESOL (4)**

Principles of curriculum design and instructional materials development in teaching English to speakers of other languages. Students work in teams to assess needs, design syllabus, develop lessons and materials, plan evaluation for English language program. Covers structural, notional and communicative, task-based, and content-based syllabus. Also offered for graduate-level credit as Ling 575 and may be taken only once for credit.

Prerequisite: Ling 390; Ling 477 or instructor's approval. Recommended: Ling 478 or teaching experience.

**Ling 476 - Corpus Linguistics in Language Teaching (4)**

Introduction to the methods of corpus linguistics, a type of computer-assisted linguistic analysis, applied to second/foreign language teaching and materials development. Includes weekly computer lab sessions conducting corpus linguistics work. Also offered for graduate-level credit as Ling 576 and may be taken only once for credit.

Prerequisite: Ling 390. Recommended: Ling 392.

**Ling 477 - TESOL Methods (4)**

The first in a two-course sequence on classroom teaching. TESOL Methods I uses tutoring and classroom observation as a basis to study theoretical and practical perspectives on classroom teaching and learning. Significant out-of-class time for group work, tutoring, and classroom observation is required. After completing TESOL Methods I, Students will have completed a portion of the hours and assignments needed for their portfolio. This is the first course in a sequence of two: Ling 477 and Ling 478 which must be taken in sequence. Also offered for graduate-level credit as Ling 577 and may be taken only once for credit.

Prerequisite: Ling 435/Ling 535, Ling 471/Ling 571.

**Ling 478 - TESOL Methods (4)**

The second in a two-course sequence on classroom teaching. TESOL Methods II uses classroom observation and practice teaching as a basis to study theoretical and practical perspectives on classroom teaching and learning. Significant out-of-class time for group work, classroom observation and practice teaching is required. After Completing TESOL Methods II, students will have completed many of the hours and assignments needed for their portfolio.

Prerequisite: LING 477/Ling 577.

**Ling 480 - Bilingualism (4)**

Survey of issues involved with bilingualism throughout the world. Explores the linguistic, sociolinguistic, and psycholinguistic aspects of simultaneous and subsequent acquisition of one or more languages. Includes perspectives of individual and societal bilingualism, and examines issues involved with bilingual language use, language processing, education, language planning, and language and identity. Also offered for graduate-level credit as Ling 580 and may be taken only once for credit.

Prerequisite: Ling 390. Strongly recommended: Ling 391.

**Ling 481 - World Englishes (4)**

Explores the role of English as a world language. Using film, audio tapes, and English language newspapers from around the world, students will become familiar with such Englishes as Malaysian English, Indian English, Nigerian English, and Filipino English. Also offered for graduate-level credit as Ling 581 and may be taken only once for credit.

Prerequisite: Ling 232 or Ling 390. Strongly recommended: Ling 391.

**Ling 482 - Pidgins and Creoles (4)**

Introduces students to the language varieties arising in contact situations. Concentration on African and New World creoles (and African American Vernacular English). Considers the formation of pidgins...
and creoles in terms of both first and second language acquisition. Looks at the social factors involved in their creation. Also offered for graduate-level credit as Ling 582 and may be taken only once for credit.

Prerequisite: Ling 390. Strongly recommended: Ling 391, Ling 392.

**Ling 490 - History of the English Language (4)**

A survey in which the development of English phonology, morphology, vocabulary, and syntax is studied through the application of modern linguistic criteria and methodology. Also offered for graduate-level credit as Ling 590 and may be taken only once for credit. Expected preparation: Ling 390.

**Ling 501 - Research (1-9)**

See department for course description. (Credit to be arranged.)

**Ling 503 - Thesis (1-9)**

See department for course description. (Credit to be arranged.)

**Ling 504 - Cooperative Education/Internship (1-9)**

See department for course description. (Credit to be arranged.)

**Ling 505 - Reading and Conference (1-6)**

See department for course description. (Credit to be arranged.)

**Ling 506 - Special Projects (1-9)**

See department for course description. (Credit to be arranged.)

**Ling 507 - Seminar (1-6)**

See department for course description. (Credit to be arranged.)

**Ling 508 - Workshop (1-6)**

See department for course description. (Credit to be arranged.)

**Ling 509 - Practicum (1-9)**

See department for course description. (Credit to be arranged.)

**Ling 510 - Selected Topics (1-6)**

See department for course description. (Credit to be arranged.)

**Ling 511 - Syntax (4)**

Introduction to modern grammatical theory, its methods, and findings. Presents patterns of argumentation, models, and basic results of research. Also offered for undergraduate-level credit as Ling 411 and may be taken only once for credit.

Prerequisite: Ling 390 and one other course in linguistics.

**Ling 512 - Phonology (4)**

How sounds pattern and how they are used in the world’s languages, how those patterns should be represented, and what theories have been advanced to explain those patterns. Some historical background to the subdiscipline and some training in linguistic analysis and argumentation.

Prerequisite: Ling 390. Recommended: Ling 415/515.

**Ling 514 - Linguistic Morphology (4)**

Focuses on analyzing word formation across languages. Prepares students for more theoretical and analytical courses in linguistics. Also introduced for graduate-level credit as Ling 417 and may be taken only once for credit.

Prerequisite: Ling 390. Recommended: Ling 411 or Ling 413.

**Ling 515 - Linguistic Phonetics (4)**

Introduces the sounds of the world’s languages with a concentration on English. Practical exercises designed to develop skills in production, discrimination, and phonetic transcription. Applications to speech technology and speech pathology. Also offered for undergraduate-level credit as Ling 415 and may be taken only once for credit.

Prerequisite: Ling 390 or concurrent enrollment.

**Ling 516 - Discourse Analysis (4)**

The examination of forms and functions in discourse. Using several analytic procedures for understanding how conversation works, especially as applied to language learning and teaching. Also offered for undergraduate-level credit as Ling 416 and may be taken only once for credit.

Prerequisite: Ling 390.

**Ling 517 - Maintenance and Revitalization of Endangered Languages (4)**

General introduction to endangered language revitalization, with a focus on native languages of the Pacific Northwest. Topics include history of attempts to eradicate native languages and the effects on those languages and their communities; theoretical basis for revitalization; emerging tribal policies; and relations between linguists and native communities. Also offered for undergraduate-level credit as Ling 417 and may be taken only once for credit.

**Ling 518 - Linguistic Morphology (4)**

The study of words and word structure. Focuses on analyzing word formation across languages. Examines the relationship between morphology, syntax and phonology, the theoretical assumptions that underlie morphological analysis, and some applications of morphological analysis. Also offered for undergraduate-level credit as Ling 418 and may be taken only once for credit.

Prerequisite: Ling 390.

**Ling 519 - Language Typology (4)**

Studies and classifies languages according to their structural features. Introduces (structural) linguistics and studies structures across languages. Prepares students for more theoretical and analytical courses in the department. Also offered for undergraduate-level credit as Ling 419 and may be taken only once for credit.

Prerequisite: Ling 390.

**Ling 520 - Historical and Comparative Linguistics (4)**

Study of language relationships and language change. Topics include the genetic classification of languages, language and prehistory, methods of historical reconstruction, and language contact. Also offered for undergraduate-level credit as Ling 420 and may be taken only once for credit.

Prerequisite: Ling 390. Recommended: Ling 412/512.

**Ling 532 - Sociolinguistics (4)**

Examines the role of language in society and how social factors can influence language. The social issues around language including
language policy and language ideology. Also offered for undergraduate-level credit as Ling 432 and may be taken only once for credit.

Prerequisite: Ling 390.

**Ling 533 - Psycholinguistics (4)**

A survey of psycholinguistics and the psychology of language, focusing on the general question of the relation between human language and human beings. Also offered for undergraduate-level credit as Ling 433 and may be taken only once for credit.

Prerequisite: Ling 390.

**Ling 537 - First Language Acquisition (4)**

Introduction to main aspects of first language acquisition in childhood, from infancy to the early school years. Examines comprehension and production of the structural and social aspects of language. Includes discussion of language acquisition theories from linguistic, psycholinguistic and sociolinguistic perspectives. Research project based on collection and analysis of child language data required. Also offered for undergraduate-level credit as Ling 437 and may be taken only once for credit.

Prerequisite: Ling 390 and Ling 391.

**Ling 538 - Second Language Acquisition (4)**

Introduction to main aspects of second language acquisition from sociolinguistic and psycholinguistic perspectives. Examines comprehension and production, stages in acquisition, cognitive processes, linguistic environment, individual variables, relationship between first and second language. Research project based on collection and analysis of language-learner language. Also offered for undergraduate-level credit as Ling 438 and may be taken only once for credit.

Prerequisite: Ling 390.

**Ling 539 - Language Assessment (4)**

Theoretical background and practical considerations in the conduct of language assessment. Students will explore traditional, quantitative methods as well as alternative, qualitative methods for systematically gathering information to inform decisions about individual language ability. Also offered for undergraduate-level credit as Ling 439 and may be taken only once for credit.

Prerequisite: Ling 390.

**Ling 545 - Linguistics and Cognitive Science (4)**

Presents current developments in linguistic theory, and in psychological theories of perception, cognition, and information processing (with special focus on language processing). Examines the fusion of linguistic and psychological theories into the rapidly growing field of cognitive science. Also offered for undergraduate-level credit as Ling 445 and may be taken only once for credit.

Prerequisite: Ling 390; 477.

**Ling 559 - Introduction to Graduate Study in Applied Linguistics (2)**

Serves as an introduction to graduate study in applied linguistics with an emphasis on critical reading, writing, and research skills needed for success in the MA.

**Ling 560 - Research Design for Applied Linguistics (2)**

Presents the major designs for research in applied linguistics. Introduces basic quantitative and qualitative methodological concepts. Provides a basis to critically read research literature in TESOL and applied linguistics. Students write a preliminary review of the literature and research question(s) for their M.A. thesis proposal.

Prerequisite: admission to the M.A. TESOL program and at least 16 credits in applied linguistics.

**Ling 561 - Research Methodology for Applied Linguistics (2)**

Second course in a two-course sequence required for M.A. TESOL students, focusing on data collection and analysis. Builds upon introduction to methods in Ling 560. Students work with data, using both quantitative and qualitative techniques. Students write a preliminary draft of the methods section for their M.A. thesis proposal.

Prerequisite: Ling 560 (no concurrent enrollment allowed).

**Ling 570 - Grammar for TESOL (4)**

A study of how to teach difficult grammatical structures in English, how to resolve problems and questions that frequently arise in the ESL classroom, and how to adapt and supplement ESL grammar tests. Also offered for undergraduate-level credit as Ling 470 and may be taken only once for credit.

Prerequisite: Ling 392 or Ling 492 or departmental grammar test.

**Ling 571 - Understanding the International Experience (4)**

Examination of communication-based dimensions of an international or intercultural experience, including teaching English to speakers of other languages. Development of strategies and activities required to meet the challenges of teaching, working, or doing research in an international/intercultural setting. All linguistics students must register for Ling 471/571, however, this course is also offered as Intl 471 and BSt 471. Also offered for undergraduate-level credit as Ling 471 and this course may be taken only once for credit.

**Ling 572 - Teaching Pronunciation (4)**

This is a practical, hands-on course in which students apply phonetics and phonology in the context of language education. While the focus is on teaching English pronunciation, the course includes general theory and applications that are useful for students planning to teach pronunciation of other languages (e.g., Spanish, Chinese). Also offered for undergraduate-level credit as Ling 472 and may be taken only once for credit.

Prerequisite: Ling 390.

**Ling 573 - Computer Assisted Language Learning (4)**

Introduction to the use of computers in language learning. Examines the research of the field to inform practical considerations
Ling 575 - Curriculum Design and Materials Development in TESOL (4)

Prerequisites of curriculum design and instructional materials development in teaching English to speakers of other languages. Students work in teams to assess needs, design syllabus, develop lessons and materials, plan evaluation for English language program. Covers structural, notional and communicative, task-based, and content-based syllabus. Also offered for undergraduate-level credit as Ling 475 and may be taken only once for credit.

Prerequisite: Ling 390; Ling 477 or instructor’s approval. Recommended: Ling 478 or teaching experience.

Ling 576 - Corpus Linguistics in Language Teaching (4)

Introduction to the methods of corpus linguistics, a type of computer-assisted linguistic analysis, applied to second/foreign language teaching and materials development. Includes weekly computer lab sessions conducting corpus linguistics work. Also offered for undergraduate-level credit as Ling 476 and may be taken only once for credit.

Prerequisite: Ling 390.

Ling 577 - TESOL Methods I (4)

The first in a two-course sequence on classroom teaching. TESOL Methods I uses tutoring and classroom observation as a basis to study theoretical and practical perspectives on classroom teaching and learning. Significant out-of-class time for group work, tutoring, and classroom observation is required. After completing TESOL Methods I, students will have completed more than one of the hours and assignments needed for their portfolio.

Prerequisite: Ling 477/Ling 577.

Ling 578 - TESOL Methods II (4)

The second in a two-course sequence on classroom teaching. TESOL Methods II uses classroom observation and practice teaching as a basis to study theoretical and practical perspectives on classroom teaching and learning. Significant out-of-class time for group work, classroom observation and practice teaching is required. After completing TESOL Methods II, students will have completed more than one of the hours and assignments needed for their portfolio.

Prerequisite: Ling 477/Ling 577.

Ling 579 - History of the English Language (4)

A survey in which the development of English phonology, morphology, vocabulary, and syntax is studied through the application of modern linguistic criteria and methodology. Also offered for undergraduate-level credit as Ling 490 and may be taken only once for credit. Expected preparation: Ling 390.

ME - Mechanical Engineering

ME 120 - An Introduction to Engineering (3)

An introduction to the skills, modern tools, teamwork, design methodology and professional practices of mechanical engineers. Students learn to analyze, fabricate and troubleshoot electromechanical systems. Students are introduced to computer programming and solid modeling. Written and oral communication is required to complete assignments and class projects.

Prerequisite: Mth 111 (concurrent enrollment allowed) or Mth 112, Mth 251, or Mth 252.

ME 121 - Introduction to Systems and Control (3)

An introduction to sensors and control of electromechanical systems. Students assemble an electromechanical system and program a microcontroller to sense the system state and maintain system equilibrium. Students build on the skills developed in ME 120. Written and oral communication is required to complete assignments and class projects.

Prerequisite: ME 120.

ME 122 - Introduction to Design (3)

An introduction to statics, dynamics, mechanical systems and the design process. Students learn to incorporate economic, social and environmental factors in the design of mechanical devices. Written and oral communication is required to complete assignments and a major class project.

Prerequisite: ME 121.

ME 199 - Special Studies (1-3)

(Credit to be arranged.) Consent of instructor.
ME 213 - Properties of Materials (4)
Basic properties, behavior, and survey of engineering and industrial applications of metals, polymers, ceramics, and composites.
Prerequisite: Ch 221. Lecture and laboratory. Corequisite: ME 213L.

ME 213L - Properties of Materials Lab (0)
Lab for Properties of Materials.
Corequisite: ME 213.

ME 241 - Manufacturing Processes (4)
Study from the designer’s viewpoint of the principal manufacturing processes utilized. Includes casting, forming, material removal, and joining processes. Process selection will be discussed in terms of the economics, process effects on the products, and dimensional and quality of the finished product. Lecture and laboratory.
Prerequisite: ME 213. Corequisite: ME 241L.

ME 241L - Manufacturing Processes Lab (0)
Lab for ME 241 Manufacturing Processes.
Corequisite: ME 241.

ME 299 - Special Studies (1-4)
(Credit to be arranged.)

ME 304 - Energy and Society (4)
Study of the energy problem: a complex societal problem which has a major technical component. Designed to help nonscience majors understand the technical side of the energy problem as well as the multidisciplinary effects of technical decisions on the social, political, and economic framework. Examination of energy requirements and usage, energy resources, methods for producing energy, environmental and economic implications of energy production, energy conservation, and energy policies. Power production techniques utilizing coal, nuclear, solar, wind, geothermal, and other energy sources will be studied.
Prerequisite: upper-division standing.

ME 320 - Fluid Mechanics (4)
Properties of fluids; hydrostatics; fluid dynamics, Bernoulli’s Equation; conservation of mass, energy, and momentum; differential analysis; and dimensional analysis.
Prerequisite: EAS 215, Mth 256. Lecture and laboratory. Corequisite: ME 320L.

ME 320L - Fluid Mechanics Lab (0)
Lab for ME 320 Fluid Mechanics.
Corequisite: ME 320.

ME 321 - Engineering Thermodynamics I (4)
Study of energy sources and utilization; First and Second Laws of thermodynamics; closed and control volume systems: thermodynamic processes and cycles; thermodynamic properties; heat power systems;
Prerequisite: Ph 223, Mth 252.

ME 322 - Applied Fluid Mechanics and Thermodynamics (4)
Internal flow, external flow, and compressible flow. Lift and drag. Turbomachinery, combustion, and psychometry.
Prerequisite: ME 320, ME 321.

ME 323 - Heat Transfer (4)
Fundamentals of engineering heat transfer with design applications; steady-state and transient analysis of conduction in one and two dimensions; concepts of convection, forced convection, internal and external flows, natural convection, and heat exchanger design; study of radiation concepts and radiation exchange between surfaces.
Prerequisite: Mth 256, Mth 261, ME 320, ME 321.

ME 350 - Programming and Numerical Methods (2)
Introduction to programming. Topics include: MATLAB programming; variables, arrays, logical expressions, and loops; structured programming with m-files, input and output control; introduction to engineering applications of numerical computing.
Prerequisite: EAS 101 or ME 121, Mth 261.

ME 351 - Vibrations and System Dynamics (4)
An introduction to vibrations and system dynamics for single and multiple degree-of-freedom linear systems. The course includes: free and forced vibrations; resonance; modeling of mechanical, fluid, and electrical systems; Laplace transformations; and dynamic system response in the time and frequency domains. Computer analysis and solution techniques will be utilized.
Prerequisite: EAS 215, Mth 256, Mth 261, ME 320, ECE 241, ME 350.

ME 370 - Mechanical Engineering Profession (2)
Presentation of a variety of specialties and career options for the graduates of the BSME program. Includes exposure to topics related to effective and responsible practice of mechanical engineering. Topics include: engineering ethics, intellectual property, business norms and practices, life-long
learning, the relationship of engineering to society, and an awareness of contemporary local and global issues. Expected preparation: junior standing.

ME 399 - Special Studies (1-8)
(Credit to be arranged.)

ME 401 - Research (1-6)
(Credit to be arranged.) Consent of instructor.

ME 402 - Independent Study (1-12)
(Credit to be arranged.)

ME 403 - Honors Thesis (1-4)
(Credit to be arranged.)

ME 404 - Cooperative Education/Internship (1-12)
(Credit to be arranged.) Consent of instructor.

ME 405 - Reading and Conference (1-6)
(Credit to be arranged.) Consent of instructor.

ME 406 - Special Projects (1-6)
(Credit to be arranged.) Consent of instructor.

ME 407 - Seminar (1-6)
(Credit to be arranged.) Consent of instructor.

ME 410 - Selected Topics (1-6)
(Credit to be arranged.) Consent of instructor.

ME 411 - Engineering Measurement and Instrumentation Systems (4)
Prerequisite: ECE 221, senior standing in engineering. Corequisite: ME 411.

ME 411L - Engineering Measurement and Instrumentation Systems Lab (0)
Corequisite: ME 411.

ME 412L - Mechanical Engineering Lab Lab (0)
Lab for ME 412.
Corequisite: ME 412.

ME 413 - Engineering Material Science (4)
Study of materials with emphasis on solids; effect of microstructure and macrostructure on properties; equilibrium and non-equilibrium multiphase systems; effects of mechanical and thermal stresses, electromagnetic fields, irradiation, and chemical environments, surface and related phenomena; examples from metallic, ceramic, polymeric, and composite materials. Also offered for graduate-level credit as ME 513 and may be taken only once for credit.
Prerequisite: ME 213.

ME 415 - Advanced Topics in Energy Conversion (4)
Topics chosen for relevancy to current technological practice concerned with energy conversion. Examples include cogeneration, combined cycles, gas power plants in the Northwest, wood waste utilization, advanced engine design and combustion systems, and energy conversion systems pollution control. Each offering of this course will focus on a different single selected topic. Also offered for graduate-level credit as ME 515.
Prerequisite: ME 320, ME 323.

ME 416 - Internal Combustion Engines (4)
Chemical equilibrium, fuel chemistry and properties, thermodynamics of combustion reactions, engine processes as ideal engine cycles, engine combustion processes, engine performance, engine simulation, and vehicle emissions.
Prerequisite: ME 322, ME 323, EAS 361.

ME 417 - Gas Turbines (4)
Introduction to the thermodynamic analysis of the performance of gas turbine engines. Study of gas turbines for rotary power output as well as aircraft propulsion. Rotary power analysis focuses on the different gas turbine cycles, including combined cycles. Aircraft propulsion analysis focuses on turbojets, turbofans, turboprops ramjets, and advanced concepts.
Prerequisite: ME 322.

ME 418 - Analysis of Powerplant Cycles (4)
Review of thermodynamic cycle analysis for power generation systems. Advanced treatment of conventional Rankine and gas turbine powerplant cycles. Analysis of advanced energy conversion cycles and schemes, including combined cycles, binary cycles, cogeneration, and fluidized bed reactors. Application to power generation such as geothermal electric and solar thermal electric. Utilization of garbage and wood wastes. Project required. Also offered for graduate-level credit as ME 518 and may be taken only once for credit.
Prerequisite: ME 322 or equivalent and consent of instructor.

ME 420 - Thermal Systems Design (4)
Introduction to the design of thermal systems for HVAC, energy conversion, and industrial process applications. Procedures for selection of fluid flow equipment, heat exchangers, and combustion equipment. Modeling performance of components and systems. Cost estimation and economic evaluation. Design optimization. Also offered for graduate-level credit as ME 520 and may be taken only once for credit.
Prerequisite: ME 320, ME 323.

ME 421 - Heating, Ventilating, and Air Conditioning Design Fundamentals (4)
Fundamental principles and methods of controlling living space environments; design of heating, ventilating, air conditioning, and refrigeration systems for residential, commercial, and industrial purposes. Topics include: moist air properties (psychrometrics), air conditioning processes, indoor air quality (comfort and health), heat transmission in building structures, solar radiation, space heating and cooling load analysis, energy calculations, and air conditioning systems and equipment. Also offered for graduate-level credit as ME 521 and may be taken only once for credit.
Prerequisite: ME 323.
ME 422 - Building Energy Use Modeling (4)
Analysis of annual energy use of residential and commercial buildings. Emphasis on computer simulation techniques for analysis of building energy use and study of energy-efficient building design. Topics include: heat loss and gain in buildings, heating and cooling load calculations, energy use analysis, daylighting in commercial buildings, energy efficiency, green building technologies, and modeling for energy code compliance. Project in design/simulation. Also offered for graduate-level credit as ME 522 and may be taken only once for credit.

ME 423 - Fundamentals of Building Science (4)
Introduction to the fundamental concepts of building science. Buildings as a system, including interactions among subsystems such as heating and cooling, ventilation, the thermal envelope, air leakage, and occupants. Building energy efficiency. Performance of heating, cooling, and ventilating systems. Indoor air quality and other health and safety issues, including assessing and resolving moisture problems. Applications of common and cutting-edge building science measurement and monitoring tools. The class will include one lecture and one lab session each week. Some/all of the lecture portion of the course may be delivered online through course-management software. Group projects may involve laboratory measurement, field monitoring, and/or computer simulation. Also offered for graduate-level credit as ME 523 and may be taken only once for credit.

Prerequisite: ME 321 or graduate standing in engineering or architecture.

ME 424 - HVAC System Design and Controls (4)
Design of HVAC equipment, integration of systems, and design of controls for buildings. Application of HVAC fundamentals. Subjects include: building, block and zone load estimates; air/hydronic systems design; refrigeration; air handling units; cooling and heating plants; basic control concepts; sensors and actuators; pneumatic, electronic, and digital controls; HVAC subsystem and controls; complete HVAC systems and controls. Also offered for graduate-level credit as ME 524 and may be taken only once for credit.

Prerequisite: ME 421/521 and ME 351.

ME 425 - Advanced Topics in Building Science (4)
Advanced design or analysis topics will be presented. Topics will be chosen for relevancy to current technological practice concerned with building science. Examples include clean room design, advanced computer simulation techniques such as advanced building energy use simulation or attic and wall moisture modeling, and advanced lighting design for commercial buildings. Each offering of this course will focus on a different single selected topic.

ME 426 - Solar Engineering (4)
Overview of solar energy and its applications. Solar resources, solar economics, collector technology, solar thermal systems, power generation, industrial applications, thermal storage, photovoltaics, and design of systems for effective utilization of solar energy. Also offered for graduate-level credit as ME 526 and may be taken only once for credit.

Prerequisite: ME 323.

ME 431 - Pneumatic and Hydraulic Systems (4)
Fluid control and fluid power devices and components; application of Boolean algebra in control circuit design; fluid power circuit analysis; design methodology; component selection, system maintenance, and troubleshooting.

Prerequisite: EAS 361.

ME 437 - Mechanical Systems Design (4)
Objective of this course is to integrate various analysis methods in the context of design projects with realistic constraints. Emphasis is on defining problems, identifying solution methods, and synthesizing solutions while considering production and economic factors. Teamwork, communication skills, and ability to learn independently is highly emphasized. Also offered for graduate-level credit as ME 537 and may be taken only once for credit.

Prerequisite: ME 241, ME 351, ME 314.

ME 438 - Fundamentals of MEMS and Microsystems (4)
The underlying principles of physics, mechanics and materials science as they apply to MEMS will be covered and coupled closely with the basic and applied aspects of microsystems engineering. Case studies involving the design, operation, fabrication and packaging of MEMS devices will be presented throughout the class. Also offered for graduate-level credit as ME 538 and may be taken only once for credit.

Prerequisite: senior or graduate standing.

ME 441 - Advanced Fluid Mechanics (4)
Partial differential equations governing the conservation of mass, momentum, and energy of Newtonian fluids are derived. Dimensional analysis is used to simplify the governing equations and in particular justify the assumption of incompressible flow. Exact solution of the Navier-Stokes equations are presented. Boundary layer approximations to the governing equations are derived, and both exact and integral solutions are obtained. Also offered for graduate-level credit as ME 541 and may be taken only once for credit.

Prerequisite: ME 320.

ME 442 - Advanced Heat Transfer (4)
Advanced treatment of the principles of conductive and convective heat transfer. Analytic and numerical solutions of heat conduction problems. Laminar and turbulent convective heat transfer. Also offered for graduate-level credit as ME 542 and may be taken only once for credit.

Prerequisite: ME 322, ME 323.

ME 443 - Advanced Engineering Thermodynamics (4)
Thermodynamics of physical and chemical systems with engineering applications; basic thermodynamic relationships; advanced techniques for their use; systems of variable composition; heat effects for reacting systems; equations of state, phase, and chemical equilibria for ideal and nonideal systems. To include one or more of several special topics: chemical kinetics; reactor analysis fundamentals; second law analysis of thermodynamic systems; introduction to statistical thermodynamics; advance energy conversion systems.

Prerequisite: ME 321.

ME 444 - Combustion (4)
Fundamental concepts of the complex phenomena involved in combustion:
thermodynamics, fluid mechanics, gas phase chemical kinetics and turbulence. Specific topics include: closed vessel explosions, detonations, flammability, flames, heterogeneous combustion, ignition, and combustion and the environment.

Prerequisite: ME 322, 323.

ME 445 - Advanced Topics in Thermal and Fluid Sciences (4)
Course topics are chosen for relevancy to current technological practice concerned with thermal and fluid sciences. Each offering of this course focuses on a specific area and is not a survey. Examples include thermal management of electronic equipment and theoretical fluid mechanics. Also offered for graduate-level credit as ME 545 and may be taken only once for credit.

ME 446 - Compressible Flow (4)

Prerequisite: ME 322, EAS 361.

ME 447 - Transfer and Rate Processes (4)
An advanced treatment of heat, mass, and momentum transfer. Development of the conservation laws, transport laws, transport properties, and basic analytic solutions. Applications to heat transfer equipment, catalytic reactors, drying processes. Also offered for graduate-level credit as ME 547 and may be taken only once for credit.

Prerequisite: ME 323, ME 320, senior or graduate standing.

ME 448 - Applied Computational Fluid Dynamics (4)
Computational fluid dynamics (CFD) is presented as a design tool for analyzing flow and heat transfer. Algorithms implemented in commercial CFD packages are reviewed. Training in use of a commercial code is provided. Case studies reinforce fundamental understanding of flow and heat transfer, and highlight the implementation-specific aspects of commercial codes. An independent project is required. Also offered for graduate-level credit as ME 548 and may be taken only once for credit.

Prerequisite: ME 441/541.

ME 449 - Thermal Management Measurement (4)
Provides a survey of laboratory-based techniques used to diagnose electronic cooling problems, and to obtain design data for developing thermal management solutions. Provides significant practical experience: students design and build their own experiments; they take and analyze their own data. Measurements are made with handheld instruments, bench-top instruments, and with computer controlled data acquisition systems. Data reduction techniques involving centering (removal of bias error) and uncertainty analysis are used extensively. Lecture and laboratory. Also offered for graduate-level credit as ME 549 and may be taken only once for credit.

Prerequisite: ME 323, 411.

ME 450 - Solid Modeling (4)
Emphasis is on solid model construction methods using state-of-the-art solid modeling software. Topics include use of parametric geometry, construction and modification of solids, building and animating assemblies, working in groups, building sheet metal parts, drafting, and the presentation of the fundamentals of solids modeling including representation and manipulation of wireframes, surfaces, and solids. Lecture and laboratory. Also offered for graduate-level credit as ME 550 and may be taken only once for credit.

Prerequisite: senior or graduate standing in engineering or a closely related field.
Corequisite: ME 450L.

ME 450L - Lab for ME 450 (0)
Lab for ME 450.
Corequisite: ME 450.

ME 452 - Control Engineering I (4)
Introductory controls class offered to upper-division mechanical engineering undergraduates and graduate students. Includes classical theory as applied to linear systems with topics: mathematical modeling of control systems; transfer functions and block diagrams; transient response; stability; root-locus method; frequency response method; and control system design techniques. Computer analysis and solution techniques will be utilized. Also offered for graduate-level credit as ME 552 and may be taken only once for credit.

Prerequisite: upper-division ME undergraduate or graduate student; Mth 256; ECE 221; ME 351.

ME 453 - Control Engineering II (4)
Continuous control system design and applications using transfer function and state variable approaches. Introduction to digital control system design, including: transfer function and state space formulation, and time and frequency domain analysis techniques. Computer analysis and solution techniques will be utilized. Also offered for graduate-level credit as ME 553 and may be taken only once for credit.

Prerequisite: ME 452/552.

ME 454 - Controls Engineering Laboratory (4)
Design, construction and implementation of continuous controllers using analog devices. Experimental identification of the dynamic properties of mechanical systems. Digital controllers introduced, implemented and compared with the corresponding continuous controllers. Also offered for graduate-level credit as ME 554 and may be taken only once for credit.

Prerequisite: ME 452/552. Expected preparation: ME 453/553.

ME 455 - Finite Element Modeling and Analysis (4)
The finite element method as related to the solution of mechanical design problems including thermal stress analysis. Various element formulations will be discussed, and existing commercial codes will be used to demonstrate modeling and analysis techniques. Also offered for graduate-level credit as ME 555 and may be taken only once for credit.

Prerequisite: for ME 455: ME 314; for ME 555: graduate standing in engineering.

ME 457 - Introduction to Robotics (4)
Robot kinematics dynamics and control; basic components of robots: controllers, power supplies and end effectors; industrial applications of robots using peripheral devices, sensors, and vision. Also offered for
graduate-level credit as ME 557 and may be taken only once for credit.

Prerequisite: ME 453/553.

**ME 458 - Principles Of CNC Machining (4)**

A study of principles of machining, tool path generation and analytic geometry, part design and programming, integration of CAD/CAM software, structure and control of CNC machines, and introduction to computer-integrated manufacturing.

Prerequisite: ME 241 and senior standing in mechanical engineering. Lecture and laboratory. Also offered for graduate-level credit as ME 558 and may be taken only once for credit. Prerequisites: ME 241 and senior standing in mechanical engineering.

**ME 460 - Control of Mechanical Systems using Microcontrollers Laboratory (4)**

Basic interfacing and programming of microcontrollers for controls applications is introduced. Microcontrollers are interfaced with various external devices and sensors using A/D, D/A, and the SPI bus. Control of a motor driven mechanical device is implemented. A student selected final project involving the control of a physical system is required. Also offered for graduate-level credit as ME 560 and may be taken only once for credit.

Prerequisite: ME 453/553 and ME 454/554 (concurrent enrollment with ME 460/560 allowed).

**ME 463 - Advanced Topics in Control Engineering (4)**

Mathematical foundations and applications of various advanced topics in control engineering for both continuous- and discrete-time systems. Also offered for graduate-level credit as ME 563 and may be taken only once for credit.

Prerequisite: ME 453/553.

**ME 465 - Advanced Finite Element Applications (4)**

This course builds on the knowledge of introductory finite element modeling and analysis course to provide students with advanced working knowledge to tackle real world problems. Advanced element types such as Plate and Shell as well as Gap and Contact will be discussed. Advanced modeling and analysis topics include nonlinearity in stress analysis (including geometric and material nonlinearity), Buckling, Gap/Contact analysis, forced vibration and frequency response, advanced thermal/structural interactions, and mixed element modeling. Also offered for graduate-level credit as ME 565 and may be taken only once for credit.

Prerequisite: ME 455 or equivalent.

**ME 471 - Process Measurement and Control (4)**

Introduction to process control hardware, software, and interfacing. Lecture topics include: number systems, hardware concepts, data movement, programming, and interfacing. Lab exercises involve the use of microcomputers interfaced and programmed for various control and data acquisition applications. Lecture and laboratory. Also offered for graduate-level credit as ME 571 and may be taken only once for credit.

Prerequisite: ME 411/S11; ECE 201, ECE 221.

**ME 475 - Joining Processes and Design (4)**

Welding codes will be covered. Preventing calculations will be utilized. Other topics include standards of surface roughness, limits and fits, and relevant mechanical and materials aspects of various assembly and fit requirements. Statistical techniques for verification, and their relation to design requirements. Statistical techniques for tolerance analysis and synthesis relevant to various assembly and fit requirements.

Prerequisite: ME 313 or equivalent.

**ME 478 - Introduction to Electronic Packaging (4)**

This course provides a foundation on mechanical and materials aspects of electronic packaging as well as an understanding of the fundamental mechanical principles used in the design of electronic packages, boards, sub-systems, and systems with focus on their integration. Topics include design, properties, materials, interconnections, assembly processes, performance of various packaging systems, thermal management, failure mechanisms and reliability. Also offered for graduate-level credit as ME 578 and may be taken only once for credit.

Prerequisite: ME 313 or equivalent.

**ME 481 - Mechanical Tolerancing (4)**

Presents the principles of current dimensioning and tolerancing standards including their syntax, meaning, methods of verification, and their relation to design requirements. Statistical techniques for tolerance analysis and synthesis relevant to various assembly and fit requirements.

Other topics include standards of surface roughness, limits and fits, and relevant hardware and software products. A term project on a mechanical part product intended for manufacturing is required. Also offered for graduate-level credit as ME 581 and may be taken only once for credit.

Prerequisite: ME 241, ME 491 concurrently.

**ME 488 - Design of Experiments (2)**

Presents the methods of planning the data collection scheme in industrial experimentation. Topics to be covered are methods of statistical inference, randomization, blocking, empirical and mechanistic model building using factorial, scanning electron microscopy, secondary ion mass spectroscopy, electron probe microanalysis, X-ray photoelectron spectroscopy, Auger electron spectroscopy, and others. Ductile, brittle, intergranular, cleavage, quasi-cleavage, and microvoid coalescence modes of fracture are discussed. Failures in weldments, brazed and soldered joints, castings, bearings, boilers, forgings, pipelines, bridge components, gears, springs, wear components, tools, and dies.
fractional factorial designs, and least squares methods.
Prerequisite: Stat 451 CM.

ME 491 - Design Process (2)
Design methodologies will be discussed as a framework for solving broadly defined technology problems. Interdisciplinary organizational principles will be presented as tools in the design process and as a foundation for the subsequent project course. Lectures, weekly and term case studies.
Prerequisite: ME 314, ME 322, ME 351, Wr 327.

ME 492 - Conceptual Design Project (4)
Application of design methodology to original projects performed by groups of 3 to 5 students under faculty and industrial adviser. Design process will encompass engineering analysis and broader factors such as group organization, interdisciplinary interaction, and communication. The problem definition to alternative selection phases will be emphasized. Lectures, group, and class presentations.
Prerequisite: ME 491.

ME 493 - Detailed Design Project (4)
Application of design methodology to original projects begun in ME 492. The alternative selection to implementation phases will be emphasized. Lectures, group and class presentations.
Prerequisite: ME 492.

ME 493L - Mech Anal Des Lab (0)
Mech Anal Des lab.

ME 501 - Research (1-9)
(Credit to be arranged.) Consent of instructor.

ME 502 - Independent Study (1-9)
(Credit to be arranged.)

ME 503 - Thesis (1-9)
(Credit to be arranged.) Consent of instructor.

ME 504 - Cooperative Education/Internship (1-9)
(Credit to be arranged.) Consent of instructor.

ME 505 - Reading and Conference (1-6)
(Credit to be arranged.) Consent of instructor.

ME 506 - Special Projects (1-9)
(Credit to be arranged.) Consent of instructor.

ME 507 - Seminar (1-6)
(Credit to be arranged.) Consent of instructor.

ME 510 - Selected Topics (1-6)
(Credit to be arranged.) Consent of instructor.

ME 511 - Engineering Measurement and Instrumentation Systems (4)
Principles and applications of measurement methods and instrumentation techniques, as used in various engineering disciplines, are studied. Examination of general measurement concepts and instrumentation characteristics. Specific devices for measuring such parameters as displacement, force, strain, pressure, flow, temperature, motion, time, and frequency are discussed. Testing and verification of theory, design, and laboratory evaluation of mechanical components and systems are also made. Lectures and laboratory. Also offered for undergraduate-level credit as ME 411 and may be taken only once for credit.
Prerequisite: ECE 221, senior standing in engineering.

ME 511L - Engineering Measurement and Instrumentation Systems Lab (0)
Lab for Engineering Measurement and Instrumentation Systems.

ME 512 - Advanced Vibrations (4)
Vibration analysis of single and multiple degree of freedom systems. Topics include: (1) modeling of linear systems using matrix methods; (2) modal analysis; (3) general forcing and Fourier series methods; (4) random and self excited vibrations; (5) nonlinear vibrations. Also offered as ME 612 and may be taken only once for credit.
Prerequisite: ME 351.

ME 513 - Engineering Material Science (4)
Study of materials with emphasis on solids; effect of microstructure and macrostructure on properties; equilibrium and non-equilibrium multiphase systems; effects of mechanical and thermal stresses, electromagnetic fields, irradiation, and chemical environments, surface and related phenomena; examples from metallic, ceramic, polymeric, and composite materials. Also offered for undergraduate-level credit as ME 413 and may be taken only once for credit.
Prerequisite: ME 213.

ME 515 - Advanced Topics in Energy Conversion (4)
Topics chosen for relevancy to current technological practice concerned with energy conversion. Examples include cogeneration, combined cycles, gas power plants in the Northwest, wood waste utilization, advanced engine design and combustion systems, and energy conversion systems pollution control. Each offering of this course will focus on a different single selected topic. Also offered for undergraduate-level credit as ME 415.

ME 516 - Internal Combustion Engines (4)
Chemical equilibrium, fuel chemistry and properties, thermodynamics of combustion reactions, engine processes as ideal engine cycles, engine combustion processes, engine performance, engine simulation, and vehicle emissions.
Prerequisite: ME 322, ME 323, EAS 361.

ME 517 - Gas Turbines (4)
Introduction to the thermodynamic analysis of the performance of gas turbine engines. Study of gas turbines for rotary power output as well as aircraft propulsion. Rotary power analysis focuses on the different gas turbine cycles, including combined cycles. Aircraft propulsion analysis focuses on turbojets, turbofans, turboprops ramjets, and advanced concepts.
Prerequisite: ME 322.

ME 518 - Analysis of Powerplant Cycles (4)
Review of thermodynamic cycle analysis for power generation systems. Advanced treatment of conventional Rankine and gas turbine powerplant cycles. Analysis of advanced energy conversion cycles and schemes, including combined cycles, binary cycles, cogeneration, and fluidized bed reactors. Application to power generation such as geothermal electric and solar...
thermal electric. Utilization of garbage and wood wastes. Project required. Also offered for undergraduate-level credit as ME 418 and may be taken only once for credit.

Prerequisite: ME 322 or equivalent and consent of instructor.

ME 520 - Thermal Systems Design (4)
Introduction to the design of thermal systems for HVAC, energy conversion, and industrial process applications. Procedures for selection of fluid flow equipment, heat exchangers, and combustion equipment. Modeling performance of components and systems. Cost estimation and economic evaluation. Design optimization. Also offered for undergraduate-level credit as ME 420 and may be taken only once for credit.

Prerequisite: ME 320, ME 323.

ME 521 - Heating, Ventilating, and Air Conditioning Design Fundamentals (4)
Fundamental principles and methods of controlling living space environments; design of heating, ventilating, air conditioning, and refrigeration systems for residential, commercial, and industrial purposes. Topics include: moist air properties (psychometrics), air conditioning processes, indoor air quality (comfort and health), heat transmission in building structures, solar radiation, space heating and cooling load analysis, energy calculations, and air conditioning systems and equipment. Also offered for undergraduate-level credit as ME 421 and may be taken only once for credit.

Prerequisite: ME 323.

ME 522 - Building Energy Use Modeling (4)
Analysis of annual energy use of residential and commercial buildings. Emphasis on computer simulation techniques for analysis of building energy use and study of energy-efficient building design. Topics include: heat loss and gain in buildings, heating and cooling load calculations, energy use analysis, daylighting in commercial buildings, energy efficiency, green building technologies, and modeling for energy code compliance. Project in design/simulation. Also offered for undergraduate-level credit as ME 422 and may be taken only once for credit.

ME 523 - Fundamentals of Building Science (4)
Introduction to the fundamental concepts of building science. Buildings as a system, including interactions among subsystems such as heating and cooling, ventilation, the thermal envelope, air leakage, and occupants. Building energy efficiency. Performance of heating, cooling, and ventilating systems. Indoor air quality and other health and safety issues, including assessing and resolving moisture problems. Applications of common and cutting-edge building science measurement and monitoring tools. The class will include one lecture and one lab session each week. Some/all of the lecture portion of the course may be delivered online through course-management software. Group projects may involve laboratory measurement, field monitoring, and/or computer simulation. Also offered for undergraduate-level credit as ME 423 and may be taken only once for credit.

Prerequisite: ME 321 or graduate standing in engineering or architecture.

ME 524 - HVAC System Design and Controls (4)
Design of HVAC equipment, integration of systems, and design of controls for buildings. Application of HVAC fundamentals. Subjects include: building, block and zone load estimates; air/hydrionic systems design; refrigeration; air handling units; cooling and heating plants; basic control concepts; sensors and actuators; pneumatic, electronic, and digital controls; HVAC subsystem and controls; complete HVAC systems and controls. Also offered for undergraduate-level credit as ME 424 and may be taken only once for credit.

Prerequisite: ME 421/521 and ME 351.

ME 525 - Advanced Topics in Building Science (4)
Advanced design or analysis topics will be presented. Topics will be chosen for relevancy to current technological practice concerned with building science. Examples include clean room design, advanced computer simulation techniques such as advanced building energy use simulation or attic and wall moisture modeling, and advanced lighting design for commercial buildings. Each offering of this course will focus on a different single selected topic.

ME 526 - Solar Engineering (4)
Overview of solar energy and its applications. Solar resources, solar economics, collector technology, solar thermal systems, power generation, industrial applications, thermal storage, photovoltaics, and design of systems for effective utilization of solar energy. Also offered for undergraduate-level credit as ME 426 and may be taken only once for credit.

Prerequisite: ME 323.

ME 530 - Solid Mechanics (4)
This course provides the knowledge of mechanics, physics, and mathematics that concerns the behavior of solids under external actions including external forces, applied displacements, temperature changes, moisture diffusion, etc. Topics include kinematics of deformation and motion, Lagrangian strain tensor, Cauchy stress tensor, elasticity and plasticity. Also offered as ME 630 and may be taken only once for credit.

Prerequisite: undergraduate mechanics and engineering mathematics; ME 313 or equivalent.

ME 531 - Pneumatic and Hydraulic Systems (4)
Fluid control and fluid power devices and components; application of Boolean algebra in control circuit design; fluid power circuit analysis; design methodology; component selection, system maintenance, and troubleshooting.

Prerequisite: EAS 361.

ME 532 - Turbomachinery (4)
Application of thermodynamics and fluid mechanics principles to the analysis and design of various types of turbomachinery, including pumps, fans, compressors, and turbines. An advanced unified treatment is presented. Theory, operation, performance, use, and selection of turbomachines are discussed.

Prerequisite: ME 322, 331.

ME 537 - Mechanical Systems Design (4)
Objective of this course is to integrate various analysis methods in the context of design projects with realistic constraints.
Emphasis is on defining problems, identifying solution methods, and synthesizing solutions while considering production and economic factors. Teamwork, communication skills, and ability to learn independently is highly emphasized. Also offered for undergraduate-level credit as ME 437 and may be taken only once for credit.

Prerequisite: ME 241, ME 351, ME 314.

**ME 538 - Fundamentals of MEMS and Microsystems (4)**

The underlying principles of physics, mechanics and materials science as they apply to MEMS will be covered and coupled closely with the basic and applied aspects of microsystems engineering. Case studies involving the design, operation, fabrication and packaging of MEMS devices will be presented throughout the class. Also offered for undergraduate-level credit as ME 438 and may be taken only once for credit.

Prerequisite: senior or graduate standing.

**ME 541 - Advanced Fluid Mechanics (4)**

Partial differential equations governing the conservation of mass, momentum, and energy of Newtonian fluids are derived. Dimensional analysis is used to simplify the governing equations and in particular justify the assumption of incompressible flow. Exact solution of the Navier-Stokes equations are presented. Boundary layer approximations to the governing equations are derived, and both exact and integral solutions are obtained. Also offered for undergraduate-level credit as ME 441 and may be taken only once for credit.

Prerequisite: ME 320.

**ME 542 - Advanced Heat Transfer (4)**

Advanced treatment of the principles of conductive and convective heat transfer. Analytic and numerical solutions of heat conduction problems. Laminar and turbulent convective heat transfer. Also offered for undergraduate-level credit as ME 442 and may be taken only once for credit.

Prerequisite: ME 322, ME 323.

**ME 543 - Advanced Engineering Thermodynamics (4)**

Thermodynamics of physical and chemical systems with engineering applications: basic thermodynamic relationships; advanced techniques for their use; systems of variable composition; heat effects for reacting systems; equations of state, phase, and chemical equilibria for ideal and nonideal systems. To include one or more of several special topics: chemical kinetics; reactor analysis fundamentals; second law analysis of thermodynamic systems; introduction to statistical thermodynamics; advanced energy conversion systems.

Prerequisite: ME 321.

**ME 544 - Combustion (4)**

Fundamental concepts of the complex phenomena involved in combustion: thermodynamics, fluid mechanics, gas phase chemical kinetics and turbulence. Specific topics include: closed vessel explosions, detonations, flammability, flames, heterogeneous combustion, ignition, and combustion and the environment.

Prerequisite: ME 322, 323.

**ME 545 - Advanced Topics in Thermal and Fluid Sciences (4)**

Course topics are chosen for relevancy to current technological practice concerned with thermal and fluid sciences. Each offering of this course focuses on a specific area and is not a survey. Examples include thermal management of electronic equipment and theoretical fluid mechanics. Also offered for undergraduate-level credit as ME 445 and may be taken only once for credit.

**ME 546 - Compressible Flow (4)**


Prerequisite: ME 322, EAS 361.

**ME 547 - Transfer and Rate Processes (4)**

An advanced treatment of heat, mass, and momentum transfer. Development of the conservation laws, transport laws, transport properties, and basic analytic solutions. Applications to heat transfer equipment, catalytic reactors, drying processes. Also offered for undergraduate-level credit as ME 447 and may be taken only once for credit.

Prerequisite: senior or graduate standing in engineering or a closely related field.

Corequisite: ME 550L.
ME 550L - Lab for ME 550 (0)
Lab for ME 550.
Corequisite: ME 550.

ME 551 - Engineering Analysis (4)
Application of mathematical techniques to the solution of controls, dynamics, mechanical, and transport phenomena problems. Emphasis given to modeling, physical interpretation, and normalization. Topics include modeling, linear systems, partial differential equations, and complex variables. Also offered as ME 651 and may be taken only once for credit.
Prerequisite: graduate standing.

ME 552 - Control Engineering I (4)
Introductory controls class offered to upper-division mechanical engineering undergraduates and graduate students. Includes classical theory as applied to linear systems with topics: mathematical modeling of control systems; transfer functions and block diagrams; transient response; stability; root-locus method; frequency response method; and control system design techniques. Computer analysis and solution techniques will be utilized. Also offered for undergraduate-level credit as ME 452 and may be taken only once for credit.
Prerequisite: upper-division ME undergraduate or graduate student; Mth 256; ECE 221; ME 351.

ME 553 - Control Engineering II (4)
Continuous control system design and applications using transfer function and state variable approaches. Introduction to digital control system design, including: transfer function and state space formulation, and time and frequency domain analysis techniques. Computer analysis and solution techniques will be utilized. Also offered for undergraduate-level credit as ME 453 and may be taken only once for credit.
Prerequisite: ME 452/552.

ME 554 - Controls Engineering Laboratory (4)
Design, construction and implementation of continuous controllers using analog devices. Experimental identification of the dynamic properties of mechanical systems. Digital controllers introduced, implemented and compared with the corresponding continuous controllers. Also offered for undergraduate-level credit as ME 454 and may be taken only once for credit.
Prerequisite: ME 452/552. Expected preparation: ME 453/553.

ME 555 - Finite Element Modeling and Analysis (4)
The finite element method as related to the solution of mechanical design problems including thermal stress analysis. Various element formulations will be discussed, and existing commercial codes will be used to demonstrate modeling and analysis techniques. Also offered for undergraduate-level credit as ME 455 and may be taken only once for credit.
Prerequisite: for ME 455: ME 314; for ME 555: graduate standing in engineering.

ME 557 - Introduction to Robotics (4)
Robot kinematics dynamics and control; basic components of robots: controllers, power supplies and end effectors; industrial applications of robots using peripheral devices, sensors, and vision. Also offered for undergraduate-level credit as ME 457 and may be taken only once for credit.
Prerequisite: ME 351.

ME 558 - Principles Of CNC Machining (4)
A study of principles of machining, tool path generation and analytic geometry, part design and programming, integration of CAD/CAM software, structure and control of CNC machines, and introduction to computer-integrated-manufacturing.
Prerequisite: ME 241 and senior standing in mechanical engineering. Lecture and laboratory. Also offered for undergraduate-level credit as ME 458 and may be taken only once for credit. Prerequisites: ME 241 and senior standing in mechanical engineering.

ME 559 - Control of Mechanical Systems using Microcontrollers Laboratory (4)
Basic interfacing and programming of microcontrollers for controls applications is introduced. Microcontrollers are interfaced with various external devices and sensors using A/D, D/A, and the SPI bus. Control of a motor driven mechanical device is implemented. A student selected final project involving the control of a physical system is required. Also offered for undergraduate-level credit as ME 460 and may be taken only once for credit.
Prerequisite: ME 453/553 and ME 454/554 (concurrent enrollment with ME 460/560 allowed).

ME 560 - Control Engineering Laboratory (4)
Introduction to process control hardware, software, and interfacing. Lecture topics include: number systems, hardware concepts, data movement, programming, and interfacing. Lab exercises involve the use of microcomputers interfaced and programmed for various control and data acquisition applications. Lecture and
laboratory. Also offered for undergraduate-level credit as ME 471 and may be taken only once for credit.

Prerequisite: ME 411/511; ECE 201, ECE 221.

ME 572L - Adv MP Lab (0)
Lab for Advanced MP.
Corequisite: ME 572.

ME 578 - Introduction to Electronic Packaging (4)
This course provides a foundation on mechanical and materials aspects of electronic packaging as well as an understanding of the fundamental mechanical principles used in the design of electronic packages, boards, sub-systems, and systems with focus on their integration. Topics include design, properties, materials, interconnections, assembly processes, performance of various packaging systems, thermal management, failure mechanisms and reliability. Also offered for undergraduate-level credit as ME 478 and may be taken only once for credit.

Prerequisite: ME 313 or equivalent.

ME 581 - Mechanical Tolerancing (4)
Presents the principles of current dimensioning and tolerancing standards including their syntax, meaning, methods of verification, and their relation to design requirements. Statistical techniques for tolerance analysis and synthesis relevant to various assembly and fit requirements. Other topics include standards of surface roughness, limits and fits, and relevant hardware and software products. A term project on a mechanical part product intended for manufacturing is required. Also offered for undergraduate-level credit as ME 481 and may be taken only once for credit.

Prerequisite: ME 411/511; ECE 201, ECE 221.

ME 582L - Adv MP Lab (0)
Lab for Advanced MP.
Corequisite: ME 572.

ME 596 - Design Optimization (4)
Application of Numerical Optimization techniques to engineering design process. Mathematical theory of optimization and application problems in structural and machine component design will be discussed. The course involves computer-aided design optimization projects.

Prerequisite: graduate standing in engineering.

ME 601 - Research (1-9)
(Credit to be arranged.) Consent of instructor.

ME 603 - Dissertation (1-9)
(Credit to be arranged.) Consent of instructor.

ME 604 - Cooperative Education/Internship (1-9)
(Credit to be arranged.) Consent of instructor.

ME 605 - Reading and Conference (1-9)
(Credit to be arranged.) Consent of instructor.

ME 606 - Special Projects (1-9)
(Credit to be arranged.) Consent of instructor.

ME 607 - Seminar (1-9)
(Credit to be arranged.) Consent of instructor.

ME 610 - Selected Topics (1-9)
(Credit to be arranged.) Consent of instructor.

ME 651 - Engineering Analysis (4)
Application of mathematical techniques to the solution of controls, dynamics, mechanical, and transport phenomena problems. Emphasis given to modeling, physical interpretation, and normalization. Topics include modeling, linear systems, partial differential equations, and complex variables. Also offered as ME 551 and may be taken only once for credit.

Prerequisite: ME 351.

ME 652 - Turbomachinery (4)
Application of thermodynamics and fluid mechanics principles to the analysis and design of various types of turbomachinery, including pumps, fans, compressors, and turbines. An advanced unified treatment is presented. Theory, operation, performance, use, and selection of turbomachines are discussed.

Prerequisite: ME 322, 331.

ME 654 - Integrated Computer-aided Design (4)
Presents several design analysis computer programs in an integrated fashion. Topics include geometric modeling, motion simulation, and finite element analysis. Emphasizes the understanding of the fundamentals, proper use of programs, and interpretation of results.

Prerequisite: EAS 215, ME 314.

ME 661 - Finite Element Analysis (4)
Vibration analysis of single and multiple degree of freedom systems. Topics include: (1) modeling of linear systems using matrix methods; (2) modal analysis; (3) general forcing and Fourier series methods; (4) random and self excited vibrations; (5) nonlinear vibrations. Also offered as ME 512 and may be taken only once for credit.

Prerequisite: ME 351.

ME 662 - Advanced Vibrations (4)
This course provides the knowledge of mechanics, physics, and mathematics that concerns the behavior of solids under external actions including external forces, applied displacements, temperature changes, moisture diffusion, etc. Topics include kinematics of deformation and motion, Lagrangian strain tensor, Cauchy stress tensor, elasticity and plasticity. Also offered as ME 530 and may be taken only once for credit.

Prerequisite: undergraduate mechanics and engineering mathematics; ME 313 or equivalent.

ME 664 - Nonlinear Vibrations (4)
Application of numerical methods to the solution of nonlinear equations, dynamics, and turbulence problems. Emphasis given to modeling, physical interpretation, and normalization. Topics include modeling, linear systems, partial differential equations, and complex variables. Also offered as ME 554 and may be taken only once for credit.

Prerequisite: graduate standing.

ME 665 - Engineering Numerical Methods (4)
Numerical methods applied to engineering problems. Coverage includes interpolation, integration, root solving, solution of boundary value and initial value problems, solution of linear systems. Programming will include Fortran or C, MATLAB and Maple.

Prerequisite: ME 352.
ME 688 - Design of Industrial Experiments (4)

Presents the statistical basis of industrial experimentation used in process and design improvement. Topics include model building, randomized and blocked designs, Latin squares, analysis of variance, factorial designs, fractional factorial designs, time series analysis, and evolutionary operations.

Prerequisite: Stat 451 CM.

ME 696 - Design Optimization (4)

Application of Numerical Optimization techniques to engineering design process. Mathematical theory of optimization and application problems in structural and machine component design will be discussed. The course involves computer-aided design optimization projects.

Prerequisite: graduate standing in engineering.

Mgmt - Management

Mgmt 199 - Special Studies (1-4)
(Credit to be arranged.)

Mgmt 299 - Special Studies (1-4)
(Credit to be arranged.)

Mgmt 351 - Human Resource Management (4)

Studies the human resource management functions performed by the human resource manager as well as by the line executive or supervisor. Uses contemporary approaches and problems to analyze the entire process of performance management, including human resource planning/job design, selection and staffing, training and development, compensation, performance appraisal, and employee and labor relations. Also examines legal questions which affect human resource management.

Prerequisite: BA 302. Preference on the waiting list will be given to HRM-option students.

Mgmt 399 - Special Studies (1-6)
(Credit to be arranged.)

Mgmt 399U - Special Studies (4)
(Credit to be arranged.)

Mgmt 401 - Research (1-6)
(Credit to be arranged.)

Mgmt 402 - Independent Study (1-12)
(Credit to be arranged.)

Mgmt 404 - Internship (1-6)
(Credit to be arranged.)

Mgmt 405 - Reading and Conference (0-6)
(Credit to be arranged.) Consent of instructor.

Mgmt 407 - Seminar (1-6)
(Credit to be arranged.) Student-selected problems in business operation and management to be studied by the individual and discussed in group meeting under direction of academic staff.

Mgmt 407U - Seminar (4)
(Credit to be arranged.)

Mgmt 409 - Practicum (1-12)
(Credit to be arranged.)

Mgmt 410 - Selected Topics (0-6)
(Credit to be arranged.)

Mgmt 421 - Design Thinking for Social Innovation (4)

Engagement with the applied process of social problem analysis and solution development using principles of lean entrepreneurship and design thinking. Exposure to the dynamic and growing field of social innovation and social entrepreneurship through direct communication with leading global social innovators, research, analysis and practical application.

Prerequisite: Sophomore standing or better; competitive PSU or transfer GPA (3.0 or higher with consideration made for special circumstances) and satisfactory completion of a short essay question. Also offered for graduate-level credit as Mgmt 523s and may be taken only once for credit.

Mgmt 422 - Money Matters for Social Innovation (4)

Participants will learn how to assess market size, create a business model, evaluate and prepare common financial statements, develop nonprofit and for-profit budgets, and identify and utilize the best funding sources and legal forms for social ventures. Also offered for graduate-level credit as Mgmt 522s and may be taken only once for credit.

Prerequisite: Sophomore standing or higher; admitted to certificate: requires competitive PSU or transfer GPA (3.0 or higher with consideration made for special circumstances) and satisfactory completion of a short essay question.

Mgmt 423 - Storytelling and Impact Measurement for Social Innovation (4)

Mastery of storytelling and impact measurement is a key element for effective social innovation. Students will develop effective personal and organizational storytelling skills, examine and apply concepts of personal leadership, marketing strategy, impact analysis and reporting, and approaches to scaling innovation. Also offered for graduate-level credit as Mgmt 523s and may be taken only once for credit.

Mgmt 428 - Team Processes (4)

Designed to provide the student with a working understanding, and practical skills, related to operating effectively in team settings. The influence of member personality and attributes on teamwork, motivating team members, developing effective team processes, and constructive conflict management and team communication are some of the issues that may be addressed. Also focuses on the development and use of a variety of teams prevalent in contemporary organizations and some of the challenges faced in using these teams in an optimal fashion.

Prerequisite: BA 302.

Mgmt 441 - Collective Bargaining and Labor Negotiations (4)

Workshop giving students hands-on experience negotiating individual and group contracts. Students will learn how to manage the employment relationship within a union environment, studying: the legal environment of unions; negotiations theory and practice; and grievance resolution procedures. Students will devote significant time in class to negotiating individual and
group contracts, and will have ample opportunity to receive feedback to improve their skills.

Prerequisite: BA 302.

Mgmt 442 - Human Resources Information Technologies (4)

Fundamental HR information technology concepts and best practices. Designed for Human Resources Management and Management majors. Topics include: HRIT management, Application Service Providers (ASP), Software as a Service (SaaS), HR software evaluation, Social Media trends, HRO outsourcing, enterprise resource planning, and System Development Life Cycle.

Prerequisite: Mgmt 351.

Mgmt 445 - Organizational Design and Change (4)

Study of organizations from a macro perspective. Emphasis will be on the implications of dynamic environments, innovation, and technology for organizational structure, design, and processes. Management of change from a multilevel perspective will also be addressed.

Prerequisite: BA 302.

Mgmt 446 - Principles of International Management (4)

Study of the managerial functions and problems related to international business activity. The focus of this course is on the management of foreign trade, direct investments, and international operations. In addition, the political, economic, and cultural environments of international business are examined from the perspective of management. Comparative management is also treated through the study of other management systems.

Prerequisite: BA 302.

Mgmt 447 - The Power of Soul and Spirit in Business (4)

Seminar devoted to exploring what soul and spirit means in the context of today's workplace; its current relevance to business; strategies for injecting more soul and spirit into working environments; and methods for developing sensitivity and appreciation for this dynamic approach to being in the business world. Topics to be explored include methods for building community in the workplace; strategies for developing one's inner life; methods for fueling creativity; approaches to bringing one's whole self to work; and examining new methods of leadership. Also offered for graduate-level credit as Mgmt 547 and may be taken only once for credit.

Prerequisite: BA 302 for Mgmt 447; Mgmt 512 for Mgmt 547.

Mgmt 461 - Reward Systems and Performance Management (4)

Study of reward system practices that aid in motivation, employee development, and productivity improvement to meet organization goals. Shows how job analysis data forms the information base for both compensation and performance appraisal processes. Includes an analytic study of traditional and evolving methods of compensation management, and relates this and performance appraisal processes to the broad performance management framework. Also offered for graduate-level credit as Mgmt 561 and may be taken only once for credit.

Prerequisite: prior completion of Mgmt 351; prior completion of or concurrent registration in Mgmt 512. Preference on waiting list will be given to HRM-option students.

Mgmt 464 - Contemporary Leadership Issues (4)

Investigation of the ideas of what constitutes "effective leadership" as organizations enter the 21st century. Various aspects of the new leadership paradigm are addressed. Students will develop an awareness of their personal leadership profile and capabilities and the issues they will face as leaders in tomorrow's organizations.

Prerequisite: BA 302.

Mgmt 471 - Staffing and Employee Selection (4)

The staffing process includes the acquisition, selection, and placement of employees to achieve the strategic human resource goals of the organization. Topics covered include staffing strategies, human resource planning, legal issues, recruitment methods, selection techniques (e.g., biographical information, interviewing, ability tests, work samples, assessment centers), selection validation, and utility analysis. Also offered for graduate-level credit as Mgmt 571 and may be taken only once for credit.

Prerequisite: prior completion of Mgmt 351; prior completion of or concurrent registration in Mgmt 512. Preference on waiting list will be given to HRM-option students.

Mgmt 481 - Entrepreneurship (4)

This course focuses on the entrepreneurial practices and tools for development of a start up company, for intrapreneurial efforts in growing business, and also directing a personal career path. Topics include innovation, idea generation, evaluation, financial analysis, feasibility, business planning development and competition.

Prerequisite: admission to SBA.

Mgmt 491 - Training and Development (4)

Training and development highlights the organization's commitment to its employees. The course looks at training needs analysis; the nature, types and methods of training; career stages, paths, planning; retraining outdated workers; outplacement, evaluation of training effectiveness; long-term development programs; and processes of organization development. Also offered for graduate-level credit as Mgmt 591 and may be taken only once for credit.

Prerequisite: prior completion of Mgmt 351; prior completion of or concurrent registration in Mgmt 512. Preference on waiting list will be given to HRM-option students.

Mgmt 493 - Human Resource Strategy (4)

This is the final course in the Human Resource Management sequence. Uses case analysis, outside speakers, and a comprehensive project to provide an in-depth, analytical study of human resource management and the tasks of the modern human resource executive. Focuses on transforming the HRM function for the modern corporation. Emphasizes the strategic aspect of HRM while studying executive-level decision making in all aspects of HRM. Preference on waiting list will be given to HRM-option students.

Prerequisite: Mgmt 351, Mgmt 461, Mgmt 471.
Mgmt 501 - Research (1-9)
(Credit to be arranged.)

Mgmt 503 - Thesis (1-9)
(Credit to be arranged.)

Mgmt 504 - Internship (1-9)
(Credit to be arranged.)

Mgmt 505 - Reading and Conference (1-12)
(Credit to be arranged.) Consent of instructor.

Mgmt 507 - Seminar (1-6)
(Credit to be arranged.) Student-selected problems in business operation and management to be studied by the individual and discussed in group meeting under direction of academic staff.

Mgmt 507S - Seminar (0-8)
(Credit to be arranged.)

Mgmt 509 - Practicum (1-9)
(Credit to be arranged.)

Mgmt 509S - Practicum: Small Business Concepts II (1-8)
(Credit to be arranged.)

Mgmt 510 - Selected Topics (1-9)
(Credit to be arranged.)

Mgmt 510S - Selected Topics (1-8)
(Credit to be arranged.)

Mgmt 511 - Foundations of Strategy (2)
To survive and thrive in the global economy, organizations rely on leaders to analyze the competitive landscape, cultivate essential capabilities, and implement effective business models. These are the key contributors to a successful strategy. This course imparts the analytical skills and tools necessary for leaders to assess the external environment and develop the internal capabilities required for devising and implementing strategies that will contribute to sustained competitive advantage.

Mgmt 512 - Organizational Management (4)
Course participants explore organizational behavior, leadership, and human resource factors that contribute to long term value creation for the organization. Leadership emphasizes the creation and maintenance of relationships with key internal stakeholders as part of building organizational effectiveness, social responsibility and environmental stewardship into organizational systems. Organizations are studied from three perspectives: the individual, the work team, and the organizational system. Topics include motivation, performance assessment, creative problem solving and organizational learning, compensation, staffing, employee development, and organizational design and change.

Mgmt 513 - Law Ethics and Stewardship (4)
The course is designed to provide students with an understanding of how political, social, legal, regulatory, and environmental issues impact business organizations within a global context. Topics covered include legal issues and compliance environments, business ethics, corporate social responsibility and the public policy process. Students gain an understanding of the relationships between values, ethics and legal and public policy environments, are able to aspire to high ethical standards, and build long-term stewardship of financial, societal and natural resources into an organization’s strategy and operations.

Mgmt 514 - Integrated Strategy (2)
This course provides an integrative, capstone experience focused on strategy development and implementation in international and domestic organizations. Case analysis and advanced analytical frameworks are used to develop the skills and judgment necessary to provide strategic direction to organizations. Both business-level and corporate-level strategy development will be undertaken leading students to solidify their strategic mindset, which will be applicable across a broad range of organizations.

Prerequisite: Mgmt 511 and Fin 513.

Mgmt 515 - Information Systems and Technology in Organizations (4)
Course participants explore information, systems, and technology from a managerial responsibility perspective. This focus reflects prevailing industry expectations that business people be involved in decision-making and management related to information resources and enabling technologies. To this end, we consider strategic and operational initiatives in such areas as information management and analytics, information-technology governance, IT portfolio management, package and service selection, project management and system implementation, inter-organizational partnerships and sourcing, and ethical concerns related to technology design and information use. Managerial responsibility for social and environmental impacts associated with the management of information, systems and technology are explored.

Mgmt 521S - Design Thinking for Social Innovation (4)
Engagement with the applied process of social problem analysis and solution development using principles of lean entrepreneurship and design thinking. Exposure to the dynamic and growing field of social innovation and social entrepreneurship through direct communication with leading global social innovators, research, analysis and practical application.

Prerequisite: Sophomore standing or better, competitive PSU or transfer GPA (3.0 or higher with consideration made for special circumstances), and satisfactory completion of a short essay question. Also offered for undergraduate-level credit as Mgmt 421 and may be taken only once for credit. Prerequisites not required for graduate students.

Mgmt 522S - Money Matters for Social Innovation (4)
Participants will learn how to assess market size, create a business model, evaluate and prepare common financial statements, develop nonprofit and for-profit budgets, and identify and utilize the best funding sources and legal forms for social ventures. Also offered for undergraduate-level credit as Mgmt 422 and may be taken only once for credit.

Mgmt 523S - Storytelling and Impact Measurement for Social Innovation (4)
Mastery of storytelling and impact measurement is a key element for effective social innovation. Students will develop effective personal and organizational storytelling skills, examine and apply concepts of personal leadership, marketing strategy, impact analysis and reporting, and approaches to scaling innovation. Also offered for undergraduate-level credit as
Mgmt 423 and may be taken only once for credit.

Mgmt 531 - The Entrepreneurial Mindset (4)
The global economy requires an entrepreneurial mindset. Working on their own idea or with a local entrepreneur, students will: assess their appetite for entrepreneurship; create a venture proposal to effectively attract stakeholders: employees, partners, investors, and customers; understand venture types and their lifecycles to evaluate entrepreneurship as a career option.

Mgmt 533 - Alliances and Acquisitions (4)
Strategic alliances have become an essential element in growing a business. This course studies various types of alliances such as acquisitions, joint ventures and licensing. Covers best practices and unsuccessful practices. Case study analysis and use of current events will illustrate these practices. Pays particular attention to value creation.

Prerequisite: MBA or MSFA admission.

Mgmt 544 - Technology Management (4)
Course takes a systematic approach to managing technology and innovation. Addresses issues of technology and competition, technology infrastructure, technology strategy, research and development, the roles of invention, innovation, research and development, product development, and other critical technology related topics. Coverage will also be given to issues related to product development as well as IT strategy and in-depth examination of the current technologies of the day.

Mgmt 545 - Managing Innovation Performance (4)
Examines the non-technical, human side to the challenges of technological innovation management. Course topics include technical professional performance and productivity, high performing technical teams, managerial effectiveness, innovative work cultures, and organizational practices and policies that promote technological innovation and new product development. Practical applications of course concepts to actual work situations are emphasized.

Mgmt 546 - Principles of International Management (4)
Covers the major challenges of managing internationally, including political risk assessment, international strategy, structuring and controlling the multinational enterprise, international negotiations, and international human resource management. Course is targeted both toward managers who work abroad as well as those dealing with international business from the home country.

Mgmt 547S - The Power of Soul and Spirit in Business (4)
Seminar devoted to exploring what soul and spirit means in the context of today's workplace; its current relevance to business; strategies for injecting more soul and spirit into working environments; and methods for developing sensitivity and appreciation for this dynamic approach to being in the business world. Topics to be explored include methods for building community in the workplace; strategies for developing one's inner life; methods for fueling creativity; approaches to bringing one's whole self to work; and examining new methods of leadership. Also offered for undergraduate-level credit as Mgmt 447 and may be taken only once for credit.

Prerequisite: BA 302 for Mgmt 447; Mgmt 512 for Mgmt 547.

Mgmt 548 - Negotiation and Conflict Resolution (3)
Examines negotiation as a sometimes rational, sometimes irrational social process used for resolving conflict. Studies the interdependence between parties which causes the conflict; focuses on effective and ineffective negotiating tactics between these competing groups. Explores the use of impartial third parties to facilitate negotiations. Practical applications include labor management relationships, purchase agreements, organizational goal setting, etc.

Prerequisite: Mgmt 512.

Mgmt 554S - Negotiation and Conflict Resolution (3)
Examines negotiation as a sometimes rational, sometimes irrational social process used for resolving conflict. Studies the interdependence between parties which causes the conflict; focuses on effective and ineffective negotiating tactics between these competing groups. Explores the use of impartial third parties to facilitate negotiations. Practical applications include labor management relationships, purchase agreements, organizational goal setting, etc.

Prerequisite: Mgmt 512.

Mgmt 555 - Management of Organizational Change Negotiation and Conflict Resolution (3)
A seminar focused on the concepts, theories, and practice of managing organizational change and development. Class discussion will center on an examination of the history and assumptions of organizational development and change, the action research model and other foundations, plus a variety of organization intervention techniques. Special issues such as ethics in client-consultant relationships will be integrated into class activities.

Prerequisite: Mgmt 512.

Mgmt 556 - Organizational Politics and Power (4)
Incorporates theoretical and practical aspects of success in organizations. Topics may include how to acquire, maintain, and use power; how to deal with superiors and subordinates; techniques for more quickly rising on the organizational ladder; misuses of power; developing effective relationships; ethical power use.
Mgmt 561 - Reward Systems and Performance Management (4)

Study of reward system practices that aid in motivation, employee development, and productivity improvement to meet organization goals. Shows how job analysis data forms the information base for both compensation and performance appraisal processes. Includes an analytic study of traditional and evolving methods of compensation management, and relates this and performance appraisal processes to the broad performance management framework. Also offered for undergraduate-level credit as Mgmt 461 and may be taken only once for credit.

Prerequisite: prior completion of Mgmt 351; prior completion of or concurrent registration in Mgmt 512. Preference on waiting list will be given to HRM-option students.

Mgmt 561S - Reward Systems and Performance Management (4)

Undergraduate-level credit as Mgmt 461 and may be taken only once for credit.

Prerequisite: Mgmt 512.

Mgmt 562 - Business Strategy Capstone (4)

An integrative, capstone study of strategy formulation and implementation in international and domestic business enterprises. Case analysis and other appropriate methodologies are used to develop the skills and judgment necessary to provide overall direction to the organization. Special emphasis will be placed on how to successfully match competitive strategy with effective implementation policies.

Prerequisite: Fin 551 or 561.

Mgmt 571 - Staffing and Employee Selection (4)

The staffing process includes the acquisition, selection, and placement of employees to achieve the strategic human resource goals of the organization. Topics covered include staffing strategies, human resource planning, legal issues, recruitment methods, selection techniques (e.g., biographical information, interviewing, ability tests, work samples, assessment centers), selection validation, and utility analysis. Also offered for undergraduate-level credit as Mgmt 471 and may be taken only once for credit.

Prerequisite: prior completion of Mgmt 351; prior completion of or concurrent registration in Mgmt 512. Preference on waiting list will be given to HRM-option students.

Mgmt 571S - Staffing and Employee Selection (4)

Undergraduate-level credit as Mgmt 471 and may be taken only once for credit.

Prerequisite: Mgmt 512.

Mgmt 591S - Training and Development (4)

Training and development highlights the organization’s commitment to its employees. The course looks at training needs analysis; the nature, types and methods of training; career stages, paths, planning; retraining outdated workers; outplacement, evaluation of training effectiveness; long-term development programs; and processes of organization development.

Prerequisite: prior completion of Mgmt 351; prior completion of or concurrent registration in Mgmt 512. Preference on waiting list will be given to HRM-option students.

Mgmt 591 - Training and Development (4)

Training and development highlights the organization’s commitment to its employees. The course looks at training needs analysis; the nature, types and methods of training; career stages, paths, planning; retraining outdated workers; outplacement, evaluation of training effectiveness; long-term development programs; and processes of organization development.

Prerequisite: prior completion of Mgmt 351; prior completion of or concurrent registration in Mgmt 512. Preference on waiting list will be given to HRM-option students.

Mgmt 591S - Training and Development (4)

Undergraduate-level credit as Mgmt 491 and may be taken only once for credit.

Prerequisite: Mgmt 512.

Mgmt 598 - Ecosystem Services Valuation: An Integrated Assessment (4)

Explore environmental, social and economic theories of valuation, quantitative and qualitative methods for incorporating the values into ecosystem service management decisions, novel approaches for integrating each type of values into comprehensive measures, and applications through interdisciplinary team projects. This is the same course as Ec 698; may only be taken once for credit.

Crosslisted as: Ec 698.

Mgmt 601 - Research (1-9)

(Credit to be arranged.)

Mgmt 607 - Seminar (1-9)

(Credit to be arranged.)

Mgmt 694 - Methods and Models in Ecosystem Services (4)

Evaluates changing ecosystem services in a holistic way, drawing multiple disciplines, including ecology, economics, engineering, and geographical and spatial sciences. Introduces methods and models from multiple disciplines to analyze ecosystem services across biophysical, social, economic, and cultural contexts. Provides an interdisciplinary foundation for evaluating ecosystem services. This is the same course as Geog 694 and may be taken only once for credit.

Crosslisted as: Geog 694.
MGrk - Modern Greek

MGrk 101 - First-Year Modern Greek (4)
An introduction to elementary modern Greek. Emphasis on listening comprehension and oral practice, the elements of grammar, vocabulary building, elementary readings and writing exercises. This is the first course in a sequence of three: MGrk 101, MGrk 102, MGrk 103.

MGrk 102 - First-Year Modern Greek (4)
An introduction to elementary modern Greek. Emphasis on listening comprehension and oral practice, the elements of grammar, vocabulary building, elementary readings and writing exercises. This is the second course in a sequence of three: MGrk 101, MGrk 102, MGrk 103.

MGrk 103 - First-Year Modern Greek (4)
An introduction to elementary modern Greek. Emphasis on listening comprehension and oral practice, the elements of grammar, vocabulary building, elementary readings and writing exercises. This is the third course in a sequence of three: MGrk 101, MGrk 102, MGrk 103.

MGrk 199 - Special Studies (1-8)
(Credits to be arranged.)

MGrk 201 - Second-Year Modern Greek (4)
Intensive review of basic materials introduced in first-year program and further development of communication skills. This is the first course in a sequence of three: MGrk 201, MGrk 202, and MGrk 203. Recommended prerequisite: MGrk 103.

MGrk 202 - Second-Year Modern Greek (4)
Intensive review of basic materials introduced in first-year program and further development of communication skills. This is the second course in a sequence of three: MGrk 201, MGrk 202, and MGrk 203. Recommended prerequisite: MGrk 103.

MGrk 203 - Second-Year Modern Greek (4)
Intensive review of basic materials introduced in first-year program and further development of communication skills. This is the third course in a sequence of three: MGrk 201, MGrk 202, and MGrk 203. Recommended prerequisite: MGrk 103.

MGrk 299 - Special Studies (1-8)
(Credit to be arranged.)

MGrk 301 - Third-Year Modern Greek (4)
Intermediate to advanced Modern Greek. Intensive grammatical review, use of increasingly complex syntax. Extensive oral and written practice. This is the first course in a sequence of three: MGrk 301, MGrk 302, and MGrk 303.
Prerequisite: MGrk 203 or instructor’s permission.

MGrk 302 - Third-Year Modern Greek (4)
Intermediate to advanced Modern Greek. Intensive grammatical review, use of increasingly complex syntax. Extensive oral and written practice. This is the second course in a sequence of three: MGrk 301, MGrk 302, and MGrk 303.
Prerequisite: MGrk 203 or instructor’s permission.

MGrk 303 - Third-Year Modern Greek (4)
Intermediate to advanced Modern Greek. Intensive grammatical review, use of increasingly complex syntax. Extensive oral and written practice. This is the third course in a sequence of three: MGrk 301, MGrk 302, and MGrk 303.
Prerequisite: MGrk 203 or instructor’s permission.

MGrk 330 - Modern Greek Culture and Civilization (4)
A multimedia survey of major trends and developments in Modern Greek culture from 1830 to present. Includes topics in religion, social customs, traditions, gender roles in family and social life, language, literature, music, cinema and the Greek Diaspora. Taught in English.

MGrk 330U - Modern Greek Culture and Civilization (4)
A multimedia survey of major trends and developments in Modern Greek culture from 1830 to present. Includes topics in religion, social customs, traditions, gender roles in family and social life, language, literature, music, cinema and the Greek Diaspora. Taught in English.

MGrk 361 - Modern Greece Through Film (4)
Feature films followed by short lectures on the history of Modern Greek cinema from 1950 to present and discussions of their social and artistic significance to contemporary Greek culture. Focus on gender and migration. All films have English subtitles. Readings and discussions are in English.

MGrk 399 - Special Studies (1-8)
(Credit to be arranged.)

MIM - Master of Intl Mgt

MIM 501 - Research (1-9)
(Credit to be arranged.)

MIM 502 - Independent Study (1-4)
(Credit to be arranged.)

MIM 504 - Cooperative Education/Internship (1-9)
(Credit to be arranged.)

MIM 505 - Reading and Conference (1-8)
(Credit to be arranged.)

MIM 506 - Special Project (1-6)
(Credit to be arranged.)

MIM 507 - Age of Pacific Seminar Series (1-9)
Special topics either under the sponsorship of the Age of the Pacific Series or an elective course addressing contemporary business issues in international business.

MIM 508 - Workshop (1-9)
(Credit to be arranged.)

MIM 509 - Practicum (1-9)
(Credit to be arranged.)

MIM 510 - Age of Pacific Seminar Series (1-4)
Special topics either under the sponsorship of the Age of the Pacific Series or an elective course addressing contemporary business issues in international business.

MIM 512 - Global Leadership and Ethics (2)
This course provides students with a solid understanding of the concepts linking leadership to global and social systems, international organizational development, and the connection between leadership and systems. Global leadership is studied from three perspectives: the virtual team leading across borders and organizations, ethical and cultural ramifications of leadership and followership, and to emphasize leadership's
impact on the social, environmental and economic context in which they operate.

**MIM 513 - Pacific Rim Economies, Trade, and Financial Markets (3)**

The course surveys current economic trends among the Pacific Rim economies, focusing on the challenges facing both developed and developing countries. Areas of focus include the principles of international trade, balance of payments, environmental impacts of policies, financial institutions and markets which affect business between the Pacific Rim and the United States.

**MIM 514 - Global Managerial and Cost Accounting (2)**

The course covers global managerial and cost accounting issues; it also focuses on the use of accounting information within the multinational firm. In addition, the course will consider financial models used in analyzing the economic viability of new products and services. Students will also be exposed to activity-based costing, standards and variance analysis, and inventory valuation.

**MIM 515 - Global Contemporary Marketing (4)**

The global/international marketing strategies and operations of multinational corporations (MNCs) are studied through assessment of international markets, marketing environments, and various aspects of global marketing strategies and marketing management.

**MIM 516 - Contemporary Pacific Rim and World Affairs (4)**

This course offers a broad sweep of the history, politics, economics, and foreign relations of the Asia Pacific Rim countries to enhance understanding of current business attitudes and systems across the region. Linking historical events with contemporary issues, the course will help predict how the region will shape the global business community into the future.

**MIM 517 - Accounting for Global Enterprises (4)**

Study of international accounting issues crucial for effective interpretation and understanding of international business. Goal of the course is to build a framework that can be used to analyze and understand financial reports used by multinational corporations (MNCs). Special managerial and control problems of MNCs, including performance evaluation, transfer pricing, and taxation will also be addressed.

**MIM 521 - Sustainability Metrics in Business (4)**

Helps students develop an understanding of how the measurement of a global company's environmental and social performance contributes to business goals and strategies. Students examine how different global companies measure and report on their environmental and social performance, and how their different approaches link to business practices.

**MIM 522 - Global Communications (2)**

Focus on a crucial global business leadership skill: the ability to inform and persuade across cultures through speaking, writing, and listening. Topics include reading, internalizing fundamental concepts, discussing communication challenges, and practicing communication skills. The course will use a workshop format focused on experiential and collaborative learning.

**MIM 524 - Global Sourcing and Supply (4)**

This class is an overview of planning strategies and tactical execution for sustainable operational sourcing in a global environment. Topics to be reviewed include: locating and qualifying international suppliers, the strategies regarding outsourcing/off-shoring, supplier operational metrics and strategies, establishing and maintaining relationships, e-procurement, new product introduction, and quality systems with selected suppliers.

**MIM 527 - Intercultural Competence and Communications I (1)**

Study of the process of communication, its various components, and how cultural, sociocultural, psychocultural, and environmental influences affect the outcome, including the role of non-verbal communication. Analysis of successful adaptation to new cultures, including developing a communication competence in a new culture and dealing with conflict. While the principles of cross-cultural communication and adaptation are generic to all cultures, two cultural environments, China and Japan, will be studied in depth, to develop cultural self-awareness. This is the first course in a sequence of two: MIM 527 and MIM 528.

**MIM 528 - Intercultural Competence and Communications II (1)**

Study of the process of communication, its various components, and how cultural, sociocultural, psychocultural, and environmental influences affect the outcome, including the role of non-verbal communication. Analysis of successful adaptation to new cultures, including developing a communication competence in a new culture and dealing with conflict. While the principles of cross-cultural communication and adaptation are generic to all cultures, two cultural environments, China and Japan, will be studied in depth, to develop cultural self-awareness. This is the second course in a sequence of two: MIM 527 and MIM 528.

**MIM 531 - Product Design and Stewardship for Sustainable Enterprises (4)**

Takes the view that to maximize a company's competitive advantage, managers need to know how to identify opportunities to initiate changes in the firm's value chains that reduce waste and generate value. Addresses the principles of industrial ecology, environmental management systems, product stewardship and life cycle analysis, eco-efficiency and design for the environment. Case studies will be used to explore the practical challenges and opportunities to implementation of product design and stewardship activities.

**MIM 534 - Global Logistics Management (4)**

Includes studies of inventory and warehouse planning and control and the principles of transportation. Managing logistics in an international environment will be the primary focus, with special attention given to air and sea transportation. Topics such as liner conferences and air freight will be included.

**MIM 535 - Global Marketing Research and Innovation (3)**

This course concentrates on how to manage an innovation process, from new opportunity identification to market introduction, with emphasis on integrating appropriate market input at each step. Students will understand how to approach the identification of new opportunities, the rapid evaluation / prioritization of these
opportunities, and management of the development and introduction processes.

MIM 541 - Global Social Innovation and Entrepreneurship (4)

This introductory course will apply the concepts of social entrepreneurship and social enterprise as a for-profit or a not-for-profit business model. It examines a range of ownership and market orientations and the role of stakeholder engagement. Students will examine social intrapreneurships within established companies and conduct real world research projects with social entrepreneurs. Working with a client company, they will investigate a pressing business problem and provide recommendations; alternatively students will develop a mini business plan for a new social venture and acquire techniques and roadmaps for identifying, analyzing, and developing opportunities for market-based solutions to social problems.

MIM 544 - Integrated Global Supply and Logistics Management (4)

Final course in the specialization in global supply chain management. Integrates all of the concepts contained within the previous three classes. Global supply and logistics planning and strategy development is the primary emphasis. Case course where each week students will be expected to analyze and prepare a supply and logistics case in an international setting. Emphasis on developing analytical and problem-solving skills and on generating the quantitative information necessary to make superior managerial decisions.

MIM 545 - Global Selling (4)

Focuses on helping students develop an understanding of Asian company purchasing practices and buyer behavior, and linking that understanding to the development of effective selling skills in a business-to-business environment and an understanding of effective sales management strategies and activities. The integration of sales automation technology and e-business will be discussed.

MIM 551 - Managing and Leading International Non-Governmental Organizations (4)

Introduction to international non-governmental organizations and the contributions they make to the larger society. Develops an overall understanding of the relationship of strategic international NGO management and program effectiveness. Step-by-step development of a strategic plan that flows logically from the mission of the organization, the external environment, and organizational goals and objectives. Studies strategic planning, grant development, project development, execution and evaluation, marketing, financial management and law as it pertains to international NGOs.

Prerequisite: MIM 511.

MIM 558 - Global Comparative Operations Management (4)

The changing international environment in global operations will be reviewed through: comparative study of process selection, facilities design, operations planning and control, supply logistics, process best practices, technology management, international sustainable supply chains and customers, quality management, and performance measurement. The importance of operation’s involvement from new product introduction to the sustainable end of a product lifecycle will be emphasized.

MIM 561 - International Community Policy, Leadership and Decision-Making (4)

Focuses on the principles and strategies of community and economic development in relation to participatory role appraisals, livelihood strategies and assessments, and community leadership and decision making. How to identify the interrelationships and influence of human behavior, natural resources and economic circumstances. Also focuses particularly on economically-disadvantaged international communities. Methods of engagement between international non-governmental organizations, corporations, and communities to further their respective and mutual objectives are addressed.

Recommended prerequisite: MIM 511.

MIM 564 - Global Human Resource Management (4)

Examines the management of human resources in the international firm, including motivating and leading employees in multicultural contexts. Course begins with an analysis of the human resource management philosophies and approaches to industrial and employee relations in representative countries. Integration of human resource management systems in international firms, including the creation of global corporate culture, HR support for organizational learning and approaches to human resource management transfer across borders, are also studied. Also examines the nature of successful cross-cultural teams and principles of leading change in multinational firms.

MIM 568 - Managing Information Technology Globally (2)

Explores the crucial roles that executives, managers, and business professionals play in selecting, sourcing, designing, and implementing information technologies, and in managing the business processes that produce value from those investments. Positions these issues in the context of the particular challenges that arise in managing information technology across international boundaries and in global firms.

MIM 571 - Global Strategic Cost Management (4)

Takes the perspective that global managers should use multiple approaches to developing and using accounting information for global companies. Special emphasis placed on understanding traditional cost systems, activity-based costing systems, cost management in global supply chains and determining the cost of quality. Relies heavily on the examination of actual global company situations.

Prerequisite: MIM 574.

MIM 572 - Global Business Valuation (4)

Focuses on financial analysis of the performance of the global business or parts of the global business such as product or projects. Tools and techniques of financial statement analysis from the perspective of chief financial and accounting officers, investors and creditors; development of models for determining and forecasting the profitability and financial position of the global firm. Business valuation techniques, emphasizing cash flow projections. Some issues in costs and risk management. Theoretical principles and practical approaches of valuation of a global business or business interest, including valuation strategies for specific purposes such as mergers, acquisitions, and corporate
MIM 574 - International Corporate Finance (4)

This final course in the MIM International Corporate Finance Specialization integrates concepts, tools and knowledge gained from the previous specialization coursework. Case analyses are used to enhance analytical and quantitative skills applied to real-world situations. All case work focuses on companies having international operations, with particular emphasis on the Asia-Pacific region.

Prerequisite: MIM 574, MIM 571, and MIM 572.

MIM 579 - Asia Field Study (3)

Field study in China, South Korea and Japan. As a capstone experience, students travel to China, South Korea and Japan (possibly South Korea) to visit companies, meet with international business executives, and learn more about these cultures. This trip allows students the opportunity to immerse themselves in the culture and lifestyle of different Asian countries.

MIM 588 - Global Business Strategy I (2)

The course will analyze business strategy as both a long-term plan and the translation of that plan into sustainable operational results. This 2 part course will examine how strategic decision-making can integrate social responsibility into a global business strategic plan. The course will focus on: the United States, the Pacific Rim, and the European Union. This is the first course in a sequence of two: MIM 588 and MIM 589.

MIM 589 - Global Business Strategy II (2)

The course will analyze business strategy as both a long-term plan and the translation of that plan into sustainable operational results. This 2 part course will examine how strategic decision-making can integrate social responsibility into a global business strategic plan. The course will focus on: the United States, the Pacific Rim, and the European Union. This is the second course in a sequence of two: MIM 588 and MIM 589.

MIM 573 - Cases in International Corporate Financial Management (4)

This final course in the MIM International Corporate Finance Specialization integrates concepts, tools and knowledge gained from the previous specialization coursework. Case analyses are used to enhance analytical and quantitative skills applied to real-world situations. All case work focuses on companies having international operations, with particular emphasis on the Asia-Pacific region.

Prerequisite: MIM 574.

MIM 574 - International Corporate Finance and Investment (4)

Focus on investment and financing decisions of firms operating in more than one nation. Topics include international risk and value analysis, cross border capital budgeting and capital acquisitions, financing mix, working capital management of multinationals, foreign exchange risk and exposure management, estimating cost of capital international investment, international capital markets, and sources of financing.

Prerequisite: MIM 513, 517.

MIM 575 - Marketing in Asia and the Pacific Rim (4)

Study of marketing strategies and practices in Asian and other Pacific Rim countries. Markets, marketing environments, and marketing practices in selected Asian countries are analyzed. Planning, and managing marketing strategies and operations are also included.

Prerequisite: MIM 515, 516, 523, 547.

MIM 577 - International Business Negotiations (3)

Examination of the theory and techniques of negotiation, influencing, and dispute resolution for forging mutually profitable business relationships, enhancing team cohesion, and establishing sustainable international partnerships. The course makes extensive use of negotiation role plays, out-of-class exercises, and panels by experienced negotiators.

Prerequisite: MIM 574.

Mktg 338U - Professional Selling (4)

An introductory course designed to provide an overview of personal selling as an element of the marketing function for both industrial and retail professional sales with an emphasis on the sales process including prospecting, approaching, presenting, negotiating, closing and follow-up. Topics include sales careers, sales strategies and tactics, buyer behavior as part of individual and group purchase processes, establishing and building customer relationships and the role of selling in the marketing effort. In addition to formal theoretical coursework, students practice sales skills in role plays, presentations and other exercises requiring practical application of selling theory.

Prerequisite: BA 205.

Mktg 340 - Advertising (4)

An introductory course designed to provide an overview of marketing communications, plus an understanding of fundamental advertising issues and strategies. Course focuses on concepts, principles, processes, terminology, trends, and techniques which shape this constantly changing field including the impact of technology on message delivery.

Mktg 340U - Advertising (4)

An introductory course designed to provide an overview of marketing communications, plus an understanding of fundamental advertising issues and strategies. Course focuses on concepts, principles, processes, terminology, trends, and techniques which shape this constantly changing field including the impact of technology on message delivery.

Mktg 341 - Public Relations (4)

Principles of public relations in contemporary America, with emphasis on the role of public relations in business.

Mktg 363 - Consumer Behavior and Customer Satisfaction (4)

Explores the determinants of consumer and business buying behavior. Applications of behavioral concepts to marketing strategy are emphasized along with how to measure, retain, and enhance customer satisfaction while developing long-term relationships.
The use of technology and databases in understanding the marketplace is explored.
Prerequisite: BA 311; six credits in psychology, sociology, or anthropology in any combination recommended.

**Mktg 373 - Merchandising Management (4)**
This course focuses on the specific strategies and tactics used by retail, wholesale, and manufacturing industry professionals to forecast, plan, execute, and achieve sales, inventory, turnover, gross margin, and profit objectives. Hands-on practice will build real-world skills and insight and course will include contributions from industry professionals.
Prerequisite: BA 311.

**Mktg 375 - Retailing (4)**
Focuses on the retail distribution of food and consumer goods to consumers with emphasis on the dynamic nature of the retail environment and how changes in consumer demographics, new technology, new competitive forms, and the internet are revolutionizing the retail industry. Topics include: Staffing, management, and retail operations, category management, web marketing, merchandising, and promotion.
Prerequisite: BA 311.

**Mktg 376 - International Business (4)**
International business concepts and practices relating to international trade are presented at a survey level. Current global issues related to international trade and actual international problems are identified along with the basic concepts related to international finance, management, and marketing practices.

**Mktg 399 - Special Studies (1-6)**
(Credit to be arranged.)
Prerequisite: BA 311.

**Mktg 407 - Seminar (1-6)**
(Credit to be arranged.) Student-selected problems in business operation and business management to be studied by the individual and discussed in group meeting under direction of academic staff.
Prerequisite: BA 311.

**Mktg 409 - Practicum (1-12)**
(Credit to be arranged.) Field work involving the practice of professional activities away from campus.
Prerequisite: consent of instructor.

**Mktg 410 - Selected Topics (1-8)**
(Credit to be arranged.)

**Mktg 435 - Consumer Package Goods Marketing (4)**
Examines marketing distribution systems used by food and consumer package goods (CPG) companies. Emphasis on describing CPG industry value chains and how business environmental factors impact the creation, delivery, and capture of customer value by different industry participants. Examines the marketing relationships between manufacturers, wholesalers, brokers, retailers, and consumers. Topics include ECR, category management, Efficient Replenishment, retail trends in buyer behavior, e-commerce, new product introductions, Efficient Promotion, trade relations, industry alliances, competitive trends, channel roles and conflicts, and globalization. Also offered for graduate-level credit as Mktg 535 and may be taken only once for credit.
Prerequisite: BA 311 or 339.

**Mktg 436 - Competitive Dynamics in the Athletic and Outdoor Industry (4)**
Understand the distinctive challenges and insights of the athletic and outdoor industry. Examine the unique business practices of both manufacturers and retailers in this industry. Study such issues as brand management, customer service, supply chain management, innovation, and sustainability in the athletic and outdoor industry.

**Mktg 437 - Product Management in the Athletic and Outdoor Industry (4)**
Provides insight into the product planning process for apparel, footwear, and hard goods in the athletic and outdoor industry. Provides an overview and hands on group project experience of ideating, creating, producing, merchandising, marketing and delivering a product to market. Also offered for graduate-level credit as Mktg 537 and may be taken only once for credit.
Prerequisite: BA 311.

**Mktg 441 - Media Strategy (4)**
Examines the advertising media process as an outgrowth of marketing and advertising objectives. Focuses on strategic issues, quantitative decision making, and media planning and negotiating techniques. This course is data intensive and analytical, with attention given to the Internet, local, and non-traditional mediums, as well as dominant national measured media.
Prerequisite: Mktg 340.

**Mktg 442 - Creative Strategy (4)**
Course puts into practice the theories, principles, and techniques of the advertising business loosely known as “creative.” Course material will focus on the strategy behind advertising messages, techniques for writing and designing advertisements, and the unique requirements of different types of creative messages. Also includes creative considerations for specific media including those driven by technology.
Prerequisite: Mktg 340.

**Mktg 443 - Advertising Campaigns (4)**
Emphasis is on the development of total advertising campaign from a marketing perspective. Integrates elements of the advertising process such as setting objectives, selection of target markets, budget development, media selection, message creation, production, development of presentation and recap documents and the staging of a major promotional event using both traditional and emerging advertising media as available.
Prerequisite: Mktg 340, 441, 442.

**Mktg 444 - Advertising Account Management (4)**
Course for college seniors who aspire to a career in advertising agencies as account managers as well as students who aspire to a career in advertising media or advertising creative positions working with account managers. Course will cover contemporary topics in account service, client relations, skill building, and career planning. Course
form a traditional advertising agency and offered in conjunction with the American Advertising Federation. Participants will form a traditional advertising agency and develop a national campaign for a national brand company. Campaign development focuses on research, creative strategy, the media plan, ad production, integration of promotional and interactive components, presentation, and budgeting. This is the first course in a sequence of three: Mktg 445, Mktg 446 and Mktg 447.

Prerequisite: Mktg 340.

Mktg 445 - National Student Advertising Competition (2)
A three-term, advanced learning course which is part of a national competition and is offered in conjunction with the American Advertising Federation. Participants will form a traditional advertising agency and develop a national campaign for a national brand company. Campaign development focuses on research, creative strategy, the media plan, ad production, integration of promotional and interactive components, presentation, and budgeting. This is the first course in a sequence of three: Mktg 445, Mktg 446 and Mktg 447.

Prerequisite: Mktg 340, Mktg 441 and Mktg 442.

Mktg 446 - National Student Advertising Competition (4)
A three-term, advanced learning course which is part of a national competition and is offered in conjunction with the American Advertising Federation. Participants will form a traditional advertising agency and develop a national campaign for a national brand company. Campaign development focuses on research, creative strategy, the media plan, ad production, integration of promotional and interactive components, presentation, and budgeting. This is the second course in a sequence of three: Mktg 445, Mktg 446 and Mktg 447.

Prerequisite: Mktg 340, Mktg 441 and Mktg 442.

Mktg 447 - National Student Advertising Competition (2)
A three-term, advanced learning course which is part of a national competition and is offered in conjunction with the American Advertising Federation. Participants will form a traditional advertising agency and develop a national campaign for a national brand company. Campaign development focuses on research, creative strategy, the media plan, ad production, integration of promotional and interactive components, presentation, and budgeting. This is the third course in a sequence of three: Mktg 445, Mktg 446 and Mktg 447.

Prerequisite: Mktg 340, Mktg 441 and Mktg 442.

Mktg 448 - Digital Media Planning and Design (4)
Covers the use of digital communication channels (internet, mobile, etc.) to strategically reach key audiences and foster consumer relationships. Topics include interactive media planning principles, use of digital media as PR tools, online metrics to measure marketing/advertising effectiveness, and basics of web site content construction (navigation, atmosphericcs, etc.).

Prerequisite: Mktg 340 and Mktg 441.

Mktg 449 - Portfolio Workshop (2)
Three-day weekend intensive designed to stretch students’ ability to quickly assess business problems, gather research and prepare creative communication strategy for presentation to clients. Students work for real clients, who judge presentation one week after faculty critique. Helps build student portfolio work.

Prerequisite: Mktg 340.

Mktg 450 - Product Innovation and Management (4)
Product innovation is at the core of the marketing process. The Internet has changed the rules of product development by erasing competitive barriers and emphasizing rapid development cycles. The class will focus on identifying new product opportunities, rapid innovation procedures, the management of the development process, and alignment with e-marketing strategy.

Prerequisite: BA 311.

Mktg 451 - Business-to-Business Marketing (3)
Management of the marketing activities of enterprises serving business-to-business markets. The course includes industry and competitor analysis, the fundamentals of competitive advantage and the role of product, price, distribution, and promotion in the creation of competitive market strategies.

Prerequisite: BA 311.

Mktg 455 - Technology Marketing (4)
Survey of Internet-based marketing strategies with special focus on the Web in business-to-business and business-to-consumer situations. The course encompasses the strategic market planning and implementation processes as applied to e-business including identifying and analyzing e-market opportunities, data warehousing/ mining, developing e-products, creating the customer interface, e-pricing, e-branding, and e-positioning strategies. Additional emphasis is on creating and leveraging a strategic Web presence with portals, partnerships, community building, and permission-based marketing.

Prerequisite: BA 311.

Mktg 456 - Marketing Research (4)
Studies the planning, data collection, analysis, and reporting issues relating to marketing research. Key issues include defining information needs, sampling, using conventional methods and information technology to obtain primary and secondary data, instrument design, statistical data analysis, interpretation and reporting of data.

Prerequisite: BA 311.

Mktg 457 - eMarketing (4)
Examines important marketing issues in a business world that is being transformed by widespread adoption of the Internet and related technologies. Topics include customer relationship management, effects of Internet on product-related issues (such as branding and new product development), pricing, distribution, and promotion, security, and privacy concerns. Also offered for graduate-level credit as Mktg 561 and may be taken only once for credit.

Prerequisite: BA 311.

Mktg 458 - Customer Information and Relationship Management (4)
Examines the operational, organizational and behavioral issues that surround customer relationship management. It explores the marketing processes and strategies that are needed to differentiate and interact with customers through customized offerings. Database mining techniques are used to analyze and address customer needs. Also offered for graduate-
level credit as Mktg 562 and may be taken only once for credit.

Prerequisite: BA 311, Mktg 460 for Mktg 462; Mktg 544 for Mktg 562.

Mktg 463 - Service Innovation (4)

This course is focused on the issues that confront marketing managers as they address the development of innovative services and service-oriented marketing strategies. It will cover new service design and development, standards, strategy, delivery, and service management with special attention to the technology-enablement of service business models.

Prerequisite: BA 311.

Mktg 464 - Marketing Strategy and Management (4)

Capstone marketing course that focuses on the development of the marketing plan. The emphasis is on integrating the major areas of marketing management including customer identification, industry analysis, product and communication strategies, distribution, pricing, and control in an e-business environment.

Prerequisite: BA 311, Mktg 460.

Mktg 466 - Principles of International Marketing (4)

Differences between domestic and international marketing are examined. A market-oriented conceptual foundation relating international channels of distribution, financing, documentation, transportation organizing, and staffing is presented.

Prerequisite: BA 311.

Mktg 467 - Sales Management (4)

Survey of the sales management function with attention to sales force selection, allocation of sales effort, motivation and reward of sales force, sales automation tools, and the integration of sales with e-business strategy.

Prerequisite: BA 311.

Mktg 501 - Research (1-9)

(Credit to be arranged.)

Mktg 503 - Thesis (1-9)

(Credit to be arranged.)

Mktg 504 - Internship (1-9)

(Credit to be arranged.)

Mktg 505 - Reading and Conference (1-6)

(Credit to be arranged.) Consent of instructor.

Mktg 507 - Seminar (1-6)


Mktg 507S - Seminar (1-6)


Mktg 509 - Practicum (1-9)

(Credit to be arranged.) Field work involving the practice of professional activities away from campus.

Prerequisite: consent of instructor.

Mktg 510 - Selected Topics (1-8)

(Credit to be arranged.)

Mktg 510S - Selected Studies (1-8)

Credits to be arranged.

Mktg 511 - Pioneering Innovation (4)

This foundational MBA course provides students with an understanding of the innovation process and its relationship to creating and managing organizations that can be sustained in the global economy. Included in the course is consideration of the external forces and trends that confront the innovation process, coupled with an internal assessment of corporate strengths and weaknesses. Consideration of the customer and the customer/firm interface is emphasized. Additionally the course will include methods for fostering the creative process, both individually and within the firm. Concurrent enrollment in BA 521 is required.

Corequisite: BA 521.

Mktg 512 - Marketing Strategy (4)

This course builds directly from the Pioneering Innovation course. Entrepreneurial as well as medium- and large-size organizations are considered in terms of how they develop and implement a marketing strategy. A key focus is to develop the necessary market planning and analytical skills. Specific topics include the role of marketing in a competitive environment, market segmentation, selection of target markets, development of product, pricing, packaging and distribution strategies. In addition, students will learn about social and ‘green’ marketing strategies and the impact of technology on marketing strategies and processes.

Prerequisite: Mktg 511.

Mktg 534 - Advertising and Brand Management (4)

Explores how marketing communications support strategic brand management in a changing media and consumer landscape. Examines changes in technology, consumer behavior and brand significance and their effects on the advertising industry. Course emphasizes strategic thinking and creativity, and helps prepare students to effectively contribute to brand building within a firm.

Mktg 535 - Consumer Package Goods Marketing (4)

Examines marketing distribution systems used by food and consumer package goods (CPG) companies. Emphasis on describing CPG industry value chains and how business environmental factors impact the creation, delivery, and capture of customer value by different industry participants. Examines the marketing relationships between manufacturers, wholesalers, brokers, retailers, and consumers. Topics include ECR, category management, Efficient Replenishment, retail trends in buyer behavior, e-commerce, new product introductions, Efficient Promotion, trade relations, industry alliances, competitive trends, channel roles and conflicts, and globalization. Also offered for undergraduate-level credit as Mktg 435 and may be taken only once for credit.

Prerequisite: BA 311 or 339.

Mktg 535S - Consumer Package Goods Marketing (4)

Examines marketing distribution systems used by food and consumer package goods (CPG) companies. Emphasis on describing CPG industry value chains and how business environmental factors impact the creation, delivery, and capture of customer value by different industry participants. Examines the
marketing relationships between manufacturers, wholesalers, brokers, retailers, and consumers. Topics include ECR, category management, Efficient Replenishment, retail trends in buyer behavior, e-commerce, new product introductions, Efficient Promotion, trade relations, industry alliances, competitive trends, channel roles and conflicts, and globalization.

Prerequisite: BA 311 or 339.

**Mktg 536 - Competitive Dynamics in the Athletic and Outdoor Industry (4)**

Understand the distinctive challenges and insights of the athletic and outdoor industry. Examine the unique business practices of both manufacturers and retailers in this industry. Study such issues as brand management, customer service, supply chain management, innovation, and sustainability in the athletic and outdoor industry.

**Mktg 536S - Athletic and Outdoor Marketing (4)**

Understand the distinctive challenges and insights of the active and outdoor industry. Examine the unique business practices of both manufacturers and retailers in this industry. Study such issues as brand management, customer service, supply chain management, innovation, and sustainability in the athletic and outdoor industry.

**Mktg 537 - Product Management in the Athletic and Outdoor Industry (4)**

Provides insight into the product planning process for apparel, footwear, and hard goods in the athletic and outdoor industry. Provides an overview and hands on group project experience of ideating, creating, producing, merchandising, marketing and delivering a product to market. Also offered for undergraduate-level credit as Mktg 437 and may be taken only once for credit.

Prerequisite: BA 311.

**Mktg 537S - Channel Management in the Athletic and Outdoor Industry (4)**

Provides insight into the product planning process for apparel, footwear, and hard goods in the athletic and outdoor industry. Provides an overview and hands on group project experience of ideating, creating, producing, merchandising, marketing and delivering a product to market. Also offered for undergraduate-level credit as Mktg 437 and may be taken only once for credit.

**Mktg 546 - Buyer Behavior and Communication (4)**

Study of determinants and influences on purchasing behavior emphasizing contributions from behavioral sciences. Course explores application of competitive and technological influences on buyers behavior and marketing strategy. Emphasis on marketing communication and promotion.

Prerequisite: Mktg 544.

**Mktg 547 - Distribution Strategies (3)**

Examines the fundamental and emerging trends in distribution activities of business enterprises. Course analyzes the competitive advantage(s) associated with distribution strategies. Explores trends in channel design, the changing role of participants, channel relationships, and channel communications.

Prerequisite: Mktg 544.

**Mktg 548 - New Products Management (4)**

Reviews the product innovation management process. Major topics include opportunity identification, concept generation, project evaluation, design and development, product launch strategies, and product management. Special consideration will be given to aligning product development with technology-driven, high-growth market opportunities.

Prerequisite: ISQA 511, Mktg 544.

**Mktg 549 - eServices Marketing (4)**

Examines important marketing issues in a business world that is being transformed by widespread adoption of the Internet and related technologies. Topics include customer relationship management, effects of Internet on product-related issues (such as branding and new product development), pricing, competition, and promotion, security, and privacy concerns. Also offered for undergraduate-level credit as Mktg 461 and may be taken only once for credit.

Prerequisite: BA 311.

**Mktg 561S - eMarketing (4)**

Examines important marketing issues in a business world that is being transformed by widespread adoption of the Internet and related technologies. Topics include eService relationships will be examined within a customer loyalty framework that considers customer value, switching costs, and on-line relational bonds as key drivers of loyalty.

Prerequisite: Mktg 544.

**Mktg 555 - Technology Marketing (4)**

Designed to introduce students to the special issues faced by managers marketing technology products in markets characterized by rapid change. Topics include identification of market opportunities, market segmentation, positioning, product innovation, customer value creation, managing the customer interface, and new approaches to distribution. Emphasis will be on strategies for marketing technology products in an e-business environment.

**Mktg 560 - Research for Marketing Decisions (4)**

Designed to study the methods of gathering primary and secondary information for business decisions. Also designed to study how to become a good information user. Emphasizes the planning, design, and implementation of quantitative and qualitative research projects to obtain information from internal and external business environments. Considers the evaluation and appropriate use of information, information sources and research services.

Prerequisite: ISQA 511, Mktg 544.

**Mktg 561 - eMarketing (4)**

Examines important marketing issues in a business world that is being transformed by widespread adoption of the Internet and related technologies. Topics include eService relationships will be examined within a customer loyalty framework that considers customer value, switching costs, and on-line relational bonds as key drivers of loyalty.

Prerequisite: Mktg 544.
customer relationship management, effects of Internet on product-related issues (such as branding and new product development), pricing, distribution, and promotion, security, and privacy concerns.

Prerequisite: BA 311.

Mktg 5625 - Customer Information and Relationship Management (4)

Examines the operational, organizational and behavioral issues that surround customer relationship management. It explores the marketing processes and strategies that are needed to differentiate and interact with customers through customized offerings. Database mining techniques are used to analyze and address customer needs. Also offered for undergraduate-level credit as Mktg 462 and may be taken only once for credit.

Prerequisite: BA 311, Mktg 460 for Mktg 462; Mktg 544 for Mktg 562.

Mktg 566 - Global Marketing Management (4)

Examines and provides a framework for study of the global marketing environment as well as the management of global marketing enterprises and global marketing practices. Encompasses the preparation for global competition, assessment of environmental forces, and strategic and operational planning for marketing in the global environment. Also examines the management of international, multinational and global marketing enterprises and their marketing activities.

Prerequisite: Mktg 544.

Mktg 567 - Sales Force Management (3)

Involves a detailed study of the sales management function. Issues to be addressed include designing the sales force, setting objectives, developing strategy, recruiting, evaluating, compensating, and controlling the program. Special attention is given to integrating the sales force with e-business strategy.

Prerequisite: Mktg 544.

Mktg 601 - Research (1-9)

(Credit to be arranged.)

Mktg 607 - Seminar (1-9)

(Credit to be arranged.)

MSE - Materials Science Engineering

MSE 501 - Research (1-9)

(Credit to be arranged.)

MSE 503 - Thesis (1-12)

(Credit to be arranged.)

MSE 504 - Cooperative Education/Internship (1-12)

(Credit to be arranged.)

MSE 505 - Reading and Conference (1-6)

(Credit to be arranged.)

MSE 506 - Special Projects (1-12)

(Credit to be arranged.)

MSE 507 - Seminar (1-4)

(Credit to be arranged.)

MSE 510 - Special Topics (1-4)

(Credit to be arranged.)

MSE 513 - Engineering Design for Materials Scientists (4)

Application of engineering design principles to materials problems: problem definition, design methodology, design philosophy, and practice. Introduction to fundamentals of machine design, mechanical models, mechanical systems. Required course for materials science and engineering students without an engineering background.

Prerequisite: graduate standing.

MSE 515 - Material Testing Methods (4)

Discussion and application of techniques for materials scientists including image analysis, thermal-physical analyses, fracture, and weldability testing. Lecture and laboratory.

Prerequisite: graduate standing.

MSE 547 - Diffusion (4)

The mathematics, physics, and applications of diffusion theory in materials science. Topics include carburization, nitriding, and sensitization of metals; oxidation and ion implant in semiconductors, and polymer diffusion.

Prerequisite: Mth 261, EAS 213, graduate standing.

MS - Military Science

MS 111 - Basic Leadership Skills (1)

Teaches basic leadership skills based on military training doctrine. Students will be introduced to BE-KNOW-DO method of leadership and learn how to apply it to small group leadership situations.

MS 112 - Roles of the Army (1)

A study of the Total Army it’s concepts and role in society. Examines missions, organization, personnel, and history of the Regular Army, National Guard and Reserves.

MS 113 - Adventure Training (1)

The examination and practical application of Basic Rifle Marksmanship, rappelling, mountain climbing, and basic first aid. An optional once a month field trip is offered for more extensive experience.

MS 121 - Leadership Lab (0)

Provides practical experience in selected military skills and drill and ceremonies. Permits the exercise and evaluation of leadership skills in a controlled situation. Taken in conjunction with MS classes.

MS 122 - Basic Leadership Lab (1)

Contact department for a description of this course.

MS 123 - Basic Leadership Lab (1)

Contact department for a description of this course.

MS 131 - Army Physical Fitness Training (1)

The course is designed to introduce students to the basics of physical fitness training as designed by the Army. An Army Master Physical Fitness Instructor instructs it. Participants will train to pass (score of 180 or above) the Army Physical Fitness Test, which is a combination of push-ups, sit-ups, and a 2-mile run.

MS 132 - Basic Physical Fitness (1)

Contact department for a description of this course.

MS 133 - Basic Physical Fitness (1)

Contact department for a description of this course.

MS 180 - Personal Physical Fitness (1)

Contact department for a description of this course.
MS 190 - Conduct-Pers Physical Fitness (1)
Contact department for a description of this course.

MS 199 - Special Studies (1-4)
(Credit to be arranged.)

MS 211 - Land Navigation (2)
Teaches basic topographic map reading skills and land navigation using a lensatic compass and terrain association. Includes practical exercises.

MS 212 - Leadership and Management (2)
Introduction to fundamental leadership and management including problem analysis, decision-making, planning, management control, and interpersonal skills. Topics such as professional ethics, team development, and oral communication skills.

MS 213 - Basic Military Skills (2)
The course teaches basic military skills in first aid, wireless communication, land navigation, weapons systems, and small group leadership techniques.

MS 215 - Fundamentals of Military Science (3)
Contact department for a description of this course.

MS 216 - Basic Military Science (6)
Contact department for a description of this course.

MS 221 - Leadership Lab (1)
Contact department for a description of this course.

MS 222 - Basic Leadership Lab (1)
Contact department for a description of this course.

MS 223 - Basic Leadership Lab (1)
Contact department for a description of this course.

MS 231 - Basic Physical Fitness (1)
Contact department for a description of this course.

MS 233 - Basic Physical Fitness (1)
Contact department for a description of this course.

MS 240 - OCS Phase I - Summer (2)
Contact department for a description of this course.

MS 299 - Special Studies (1-4)
(Credits to be arranged.)

MS 309 - Introduction to American Military History (3)
Covers the American Army's history from its birth in 1775 to the eve of World War I.

MS 310 - American Military History (3)
The course builds on the introduction to American Military History covering World War I to the Global War on Terror. Recommended prerequisite MS 309

MS 311 - Military Leadership (3)
This course studies Army Command and Control along with small unit leadership fundamentals. The Junior Officer's role and responsibilities in the leadership process are fully examined.

MS 312 - Military Operations (3)
The course studies the principles of war and the employment of military forces in accordance with U.S. Army doctrine, organization, equipment, and training.

MS 313 - Small-Unit Tactics (3)
The course studies the fundamentals, techniques, and procedures of light infantry squad and platoon tactics. Develops leadership skills in planning, organizing, and conducting small unit operations.

MS 314 - Advanced Summer Program (0)
Contact department for a description of this course.

MS 321 - Advanced Leadership Lab (1)
Contact department for a description of this course.

MS 322 - Advanced Leadership Lab (1)
Contact department for a description of this course.

MS 323 - Leadership Lab (1)
Contact department for a description of this course.

MS 331 - Advanced Physical Fitness (1)
Contact department for a description of this course.

MS 332 - Advanced Physical Fitness (1)
Contact department for a description of this course.

MS 333 - Advanced Physical Fitness (1)
Contact department for a description of this course.

MS 399 - Special Studies (1-4)
(Credits to be arranged.)

MS 405 - Reading and Conference (1-6)
(Credits to be arranged.)

MS 406 - Special Problems Special Projects (1-4)
(Credits to be arranged.)

MS 409 - Practical Field Experiences (1-6)
This course covers the summer practical experiences at either the Leadership Training Course (LTC) or Leadership Development and Assessment Course (LDAC).

MS 411 - Army Training Management (4)
The course studies both the Army's training philosophy and it's training system. The class focuses on the Junior Officer's role and responsibilities in the process of battle planning, establishment of unit training programs, and execution of military instruction.

MS 412 - Military Law and Administration (4)
The course focuses on Military Justice, Army Personnel Management, and Army Logistics and Supply. Students study the Junior Officer's role and responsibilities in military law enforcement, officer and enlisted personnel management, resource management, and service and support.

MS 413 - Personal Affairs and Career Development (3)
An in-depth examination of the Second Lieutenant on the Total Army and preparation for officer commissioning in the Army National Guard, Reserves or Active Duty. This course will help provide students with the critical information on various topics such as: officer specialty selection, unit assignments, promotion and
mobilization, career planning and professional development.

**MS 421 - Advanced Leadership Lab (1)**
Contact department for a description of this course.

**MS 422 - Advanced Leadership Lab (1)**
Contact department for a description of this course.

**MS 423 - Advanced Leadership Lab (1)**
Contact department for a description of this course.

**MS 431 - Advanced Physical Fitness (1)**
Contact department for a description of this course.

**MS 432 - Advanced Physical Fitness (1)**
Contact department for a description of this course.

**MS 499 - Special Studies (1-4)**
(Credits to be arranged.)

**Mth - Mathematical Sciences**

**Mth 105 - Excursions in Mathematics (4)**
Exploration of a variety of modern mathematical topics. Topics may include the mathematics of voting systems, graphs and networks, symmetry in art and nature, population growth, fractals, probability. Intended for students without a strong algebra/calculus background, but with a desire to explore some interesting mathematics.

Prerequisite: Completion of Mth 95 with a grade of C- or above within the last year, or passing at the necessary level on the mathematics placement test within the last year (see Math Department webpage at mth.pdx.edu for information).

**Mth 111 - Introductory College Mathematics I (4)**
An integrated treatment of topics from algebra and trigonometry. These courses serve as additional preparation for students with insufficient background who desire to take Mth 251, 252, 253. Neither Mth 111 nor 112 can be taken for credit if a grade of C-, P, or above has already been received for a course which requires either of them as a prerequisite. This is the first course in a sequence of two: Mth 111 and Mth 112 which must be taken in sequence.

**Mth 112 - Introductory College Mathematics II (4)**
An integrated treatment of topics from algebra and trigonometry. These courses serve as additional preparation for students with insufficient background who desire to take Mth 251, 252, 253. Neither Mth 111 nor 112 can be taken for credit if a grade of C-, P, or above has already been received for a course which requires either of them as a prerequisite. This is the second course in a sequence of two: Mth 111 and Mth 112 which must be taken in sequence.

**Mth 191 - Mathematics Tutoring (3)**
Training in one-to-one and small-group tutoring over a wide range of mathematical topics. Mth 191: tutoring in arithmetic and other non-university courses. Mth 192: tutoring in freshman-level mathematics. Mth 193: tutoring in sophomore junior- and senior-level mathematics. Required field work consists of providing tutoring service in the community or University. This is the first course in a sequence of three: Mth 191, Mth 192, and Mth 193. Recommended prerequisite: consent of instructor.

**Mth 192 - Mathematics Tutoring (3)**
Training in one-to-one and small-group tutoring over a wide range of mathematical topics. Mth 191: tutoring in arithmetic and other non-university courses. Mth 192: tutoring in freshman-level mathematics. Mth 193: tutoring in sophomore junior- and senior-level mathematics. Required field work consists of providing tutoring service in the community or University. This is the second course in a sequence of three: Mth 191, Mth 192, and Mth 193. Recommended prerequisite: consent of instructor.

**Mth 193 - Mathematics Tutoring (3)**
Training in one-to-one and small-group tutoring over a wide range of mathematical topics. Mth 191: tutoring in arithmetic and other non-university courses. Mth 192: tutoring in freshman-level mathematics. Mth 193: tutoring in sophomore junior- and senior-level mathematics. Required field work consists of providing tutoring service in the community or University. This is the third course in a sequence of three: Mth 191, Mth 192, and Mth 193. Recommended prerequisite: consent of instructor.

**Mth 199 - Special Studies (1-4)**
(Credit to be arranged.)

**Mth 211 - Foundations Of Elementary Mathematics I (4)**
A constructivist approach to fundamental ideas of mathematics for prospective K-8 teachers. Topics include numeration, operations, number theory, and problem solving. This is the first course in a sequence of three: Mth 211, Mth 212, and Mth 23 which must be taken in sequence.

**Mth 212 - Foundations Of Elementary Mathematics II (4)**
A constructivist approach to fundamental ideas of mathematics for prospective K-8 teachers. Topics include rational numbers, probability, and statistics. This is the second course in a sequence of three: Mth 211, Mth 212, and Mth 23 which must be taken in sequence.

**Mth 213 - Foundations Of Elementary Mathematics III (4)**
A constructivist approach to fundamental ideas of mathematics for prospective K-8 teachers. Topics include algebra, geometry, and measurement. This is the third course in a sequence of three: Mth 211, Mth 212, and Mth 23 which must be taken in sequence.

**Mth 241 - Calculus for Management and Social Sciences (4)**
An introduction to differential and integral calculus, this course is intuitive in approach and emphasizes applications. While intended as a terminal course, the interested student may follow it by the more extensive and rigorous calculus sequence Mth 251, 252, 253, 254. Students may not receive credit for this course if they already have credit for Mth 251.

Prerequisite: Mth 111.

**Mth 251 - Calculus I (0-4)**
Differential and integral calculus of functions of a single variable, analytic geometry, infinite series, and applications. This is the first course in a sequence of three: Mth 251, Mth 252 and Mth 253 which must be taken in sequence.
Mth 251R - Recitation Mth 251 (0)
Recitation for Mth 251.

Mth 252 - Calculus II (0-4)
Differential and integral calculus of functions of a single variable, analytic geometry, infinite series, and applications. This is the second course in a sequence of three: Mth 251, Mth 252 and Mth 253 which must be taken in sequence.

Mth 253 - Calculus III (4)
Differential and integral calculus of functions of a single variable, analytic geometry, infinite series, and applications. This is the third course in a sequence of three: Mth 251, Mth 252 and Mth 253 which must be taken in sequence.

Mth 254 - Calculus IV (4)
An introduction to differential and integral calculus of functions of several variables and applications.
Prerequisite: Mth 253 or (Mth 252 and Mth 261).

Mth 256 - Applied Differential Equations I (4)
Solution techniques in ordinary differential equations; applications.
Prerequisite: Mth 252, 261.

Mth 261 - Introduction to Linear Algebra (0-4)
Systems of linear equations, linear transformations, matrix algebra, vector spaces, and determinants.
Prerequisite: Mth 251 or passing at the necessary level of the mathematics placement test within the last year (see Math Department webpage at mth.pdx.edu for information).

Mth 261R - Recitation for Mth 261 (0)
Recitation for Mth 261.

Mth 271 - Mathematical Computing (4)
Prerequisite: Mth 253, 261.

Mth 299 - Special Studies (1-4)
(Credit to be arranged.)

Mth 300 - Introduction to Mathematical Reasoning (4)
Fundamental abstract concepts common to all branches of mathematics, including first order predicate calculus, sets and functions, and elements from group theory and the foundations of analysis. Special emphasis is placed on the ability to understand and construct rigorous proofs.
Prerequisite: Mth 253, Mth 261.

Mth 301 - Elements of Modern Mathematics I (4)
Topics selected from arithmetic, algebra, geometry, calculus, probability, and statistics. A cultural approach to mathematics in which technical proficiency is not the primary objective. Recommended for liberal arts students.
Prerequisite: Mth 111.

Mth 302 - Elements of Modern Mathematics II (4)
Topics selected from arithmetic, algebra, geometry, calculus, probability, and statistics. A cultural approach to mathematics in which technical proficiency is not the primary objective. Recommended for liberal arts students.
Prerequisite: Mth 111.

Mth 303 - Elements of Modern Mathematics III (4)
Topics selected from arithmetic, algebra, geometry, calculus, probability, and statistics. A cultural approach to mathematics in which technical proficiency is not the primary objective. Recommended for liberal arts students.
Prerequisite: Mth 111.

Mth 304 - Introduction to Mathematical Analysis I (4)
Prerequisite: Mth 253.

Mth 312 - Introduction to Mathematical Analysis II (4)
Prerequisite: Mth 253.

Mth 313 - Advanced Multivariate Calculus (4)
Differential and integral calculus of functions of several variables, the inverse and implicit function theorems, vector field theory, line and surface integrals, Green’s, Stokes’, and Gauss’ theorems.
Prerequisite: Mth 254 and Mth 312.

Mth 322 - Applied Partial Differential Equations (4)
Introduction to equations of mathematical physics, in particular, linear and nonlinear advection equation, wave equation, initial and boundary value problems, method of characteristics, separation of variables.
Prerequisite: Mth 256.

Mth 324 - Vector Analysis (4)
Modern vector methods with applications for students of mathematics, physics, and engineering.
Prerequisite: Mth 254.

Mth 338 - Modern College Geometry (4)
Topics in Euclidean and non-Euclidean geometry.
Prerequisite: Mth 252, 261.

Mth 343 - Applied Linear Algebra (4)
Topics in matrix algebra, determinants, systems of linear equations, eigenvalues, eigenvectors, and linear transformations. Selected applications from science, engineering, computer science, and business.
Mth 407 - Seminar (1-6)  
Instructor.  
(Credit to be arranged.) Consent of instructor.

Mth 344 - Introduction to Group Theory and Applications (4)  
Groups, homomorphisms, factor groups. Selected applications from geometry, combinatorics, computer science, chemistry. 
Prerequisite: Mth 252, 261.

Mth 345 - Introduction to Ring and Field Theory (4)  
Topics in rings, integral domains, fields, ordered fields, polynomial rings. The development of the real number system. 
Prerequisite: Mth 344.

Mth 346 - Number Theory (4)  
A presentation of the properties of numbers as found in the theory of divisibility, congruence, diophantine equations, continued fractions, and algebraic numbers. 
Prerequisite: Mth 252, 261.

Mth 356 - Discrete Mathematics (4)  
Topics in discrete mathematics, including propositional logic, sets, relations, inverse functions, divisibility, induction, recurrences, inclusion-exclusion, permutations, combinations, graphs, graph coloring, and applications. Expected preparation: MTH 261.  
Prerequisite: Mth 253.

Mth 399U - Special Studies (4)  
(Credit to be arranged.) Consent of instructor.

Mth 399 - Special Studies (1-6)  
(Credit to be arranged.) Consent of instructor.

Mth 401 - Research (1-6)  
(Credit to be arranged.) Consent of instructor.

Mth 404 - Cooperative Education/Internship (1-12)  
(Credit to be arranged.)

Mth 407 - Seminar (1-6)  
(Credit to be arranged.) Consent of instructor.

Mth 410 - Selected Topics (1-6)  
(Credit to be arranged.) Consent of instructor.

Mth 411 - Introduction to Real Analysis I (3)  
Sequences and series of functions; Lebesgue measure and integration; the Stone-Weierstrass and Baire category theorems; Fourier Series; elements of functional analysis. This is the first course in a sequence of three: Mth 411, Mth 412 and Mth 413 which must be taken in sequence. Also offered for graduate-level credit as Mth 511 and may be taken only once for credit.  
Prerequisite: Mth 312.

Mth 412 - Introduction to Real Analysis II (3)  
Sequences and series of functions; Lebesgue measure and integration; the Stone-Weierstrass and Baire category theorems; Fourier Series; elements of functional analysis. This is the second course in a sequence of three: Mth 411, Mth 412 and Mth 413 which must be taken in sequence. Also offered for graduate-level credit as Mth 512 and may be taken only once for credit.  
Prerequisite: Mth 312.

Mth 413 - Introduction to Real Analysis III (3)  
Sequences and series of functions; Lebesgue measure and integration; the Stone-Weierstrass and Baire category theorems; Fourier Series; elements of functional analysis. This is the third course in a sequence of three: Mth 411, Mth 412 and Mth 413 which must be taken in sequence. Also offered for graduate-level credit as Mth 513 and may be taken only once for credit.  
Prerequisite: Mth 312.

Mth 417 - Introduction to Functional Analysis I (3)  
Continuity theorems for systems. Additional topics. This is the first course in a sequence of three: Mth 417, Mth 418, and Mth 419 which must be taken in sequence. Also offered for graduate-level credit as Mth 517 and may be taken only once for credit.  
Prerequisite: Mth 317.

Mth 418 - Introduction to Functional Analysis II (3)  
Continuity theorems for systems. Additional topics. This is the second course in a sequence of three: Mth 417, Mth 418, and Mth 419 which must be taken in sequence. Also offered for graduate-level credit as Mth 518 and may be taken only once for credit.  
Prerequisite: Mth 318.

Mth 419 - Introduction to Functional Analysis III (3)  
Continuity theorems for systems. Additional topics. This is the third course in a sequence of three: Mth 417, Mth 418, and Mth 419 which must be taken in sequence. Also offered for graduate-level credit as Mth 519 and may be taken only once for credit.  
Prerequisite: Mth 319.

Mth 420 - Introduction to Complexity Theory (3)  
An introduction to theoretical computer science. Includes a study of models of computation, complexity classes, Cook's theorem, polynomial and nonpolynomial classes, discrete problems.  
Prerequisite: Mth 344.

Mth 421 - Theory of Ordinary Differential Equations I (3)  
Vector fields and phase flows in the plane. Geometric and algebraic properties of linear systems. Existence, uniqueness, and continuity theorems for systems. Additional topics. This is the first course in a sequence of three: Mth 421, Mth 422, and Mth 423 which must be taken in sequence. Also offered for graduate-level credit as Mth 521 and may be taken only once for credit.  
Prerequisite: Mth 312.

Mth 422 - Theory of Ordinary Differential Equations II (3)  
Vector fields and phase flows in the plane. Geometric and algebraic properties of linear systems. Existence, uniqueness, and continuity theorems for systems. Additional topics. This is the second course in a sequence of three: Mth 421, Mth 422, and Mth 423 which must be taken in sequence. Also offered for graduate-level credit as Mth 522 and may be taken only once for credit.  
Prerequisite: Mth 312.

Mth 423 - Theory of Ordinary Differential Equations III (3)  
Vector fields and phase flows in the plane. Geometric and algebraic properties of linear systems. Existence, uniqueness, and continuity theorems for systems. Additional topics. This is the third course in a sequence of three: Mth 421, Mth 422, and Mth 423 which must be taken in sequence. Also offered for graduate-level credit as Mth 523 and may be taken only once for credit.  
Prerequisite: Mth 312.

Mth 424 - Elementary Differential Geometry I (3)  
Differential geometry of curves and surfaces; elementary Riemannian geometry; the Gauss-Bonnet theorem; applications from mechanics and field theory. This is the first course in a sequence of two: Mth 424 and Mth 425 which must be taken in sequence. Also offered for graduate-level credit as Mth 524 and may be taken only once for credit.  
Prerequisite: Either Mth 421 or both Mth 254 and Mth 256.

Mth 425 - Elementary Differential Geometry II (3)  
Differential geometry of curves and surfaces; elementary Riemannian geometry; the Gauss-Bonnet theorem; applications from mechanics and field theory. This is the second course in a sequence of two: Mth 424 and Mth 425 which must be taken in sequence. Also offered for graduate-level
credit as Mth 525 and may be taken only once for credit.

Prerequisite: Either Mth 421 or both Mth 254 and Mth 256.

Mth 427 - Partial Differential Equations I (3)
Solution techniques, qualitative analysis and applications: separation of variables, eigenfunction expansion, Sturm-Liouville problems, Green’s functions, Fourier transform solutions, finite difference and finite element methods. This is the first course in a sequence of two: Mth 427 and Mth 428 which must be taken in sequence. Also offered for graduate-level credit as Mth 527 and may be taken only once for credit.

Prerequisite: Mth 256, Mth 253/254. Prior knowledge of PDEs (Mth 322) is recommended, but not required.

Mth 428 - Partial Differential Equations II (3)
Solution techniques, qualitative analysis and applications: separation of variables, eigenfunction expansion, Sturm-Liouville problems, Green’s functions, Fourier transform solutions, finite difference and finite element methods. This is the second course in a sequence of two: Mth 427 and Mth 428 which must be taken in sequence. Also offered for graduate-level credit as Mth 528 and may be taken only once for credit.

Prerequisite: Mth 256, Mth 253/254. Prior knowledge of PDEs (Mth 322) is recommended, but not required.

Mth 430 - Topics in Mathematical Modeling (3)
Basic introduction to mathematical model building starting with prototype, model purpose definition, and model validation. Models will be chosen from life, the physical and social sciences. Applications chosen from differential equations, linear programming, group theory, probability or other fields. Also offered for graduate-level credit as Mth 530.

Prerequisite: Consent of instructor and either Mth 256 or 421/521. With approval, this course may be repeated for credit.

Mth 431 - Topics in Geometry I (3)
Topics selected from projective geometry, non-Euclidean geometry, algebraic geometry, convexity, differential geometry, foundations of geometry, combinatorial topology. This is the first course in a sequence of three: Mth 431, Mth 432, and Mth 433; with departmental approval, this sequence may be repeated for credit. Also offered for graduate-level credit as Mth 531.

Prerequisite: Mth 311, Mth 338, or Mth 344.

Mth 432 - Topics in Geometry II (3)
Topics selected from projective geometry, non-Euclidean geometry, algebraic geometry, convexity, differential geometry, foundations of geometry, combinatorial topology. This is the second course in a sequence of three: Mth 431, Mth 432, and Mth 433; with departmental approval, this sequence may be repeated for credit. Also offered for graduate-level credit as Mth 532.

Prerequisite: Mth 311, Mth 338, or Mth 344.

Mth 433 - Topics in Geometry III (3)
Topics selected from projective geometry, non-Euclidean geometry, algebraic geometry, convexity, differential geometry, foundations of geometry, combinatorial topology. This is the third course in a sequence of three: Mth 431, Mth 432, and Mth 433; with departmental approval, this sequence may be repeated for credit. Also offered for graduate-level credit as Mth 533.

Prerequisite: Mth 311, Mth 338, or Mth 344.

Mth 434 - Set Theory and Topology I (3)
Cardinal and ordinal numbers. The axiom of choice and equivalent formulations. Introduction to general topology with the notions of interior, closure, topological space, continuity, and homeomorphism. Construction techniques and properties of point-set topology, especially connectedness, compactness, and separation. Additional topics. This is the first course in a sequence of three: Mth 434, Mth 435, and Mth 436 which must be taken in sequence. Also offered for graduate-level credit as Mth 534 and may be taken only once for credit.

Prerequisite: Mth 311.

Mth 435 - Set Theory and Topology II (3)
Cardinal and ordinal numbers. The axiom of choice and equivalent formulations. Introduction to general topology with the notions of interior, closure, topological space, continuity, and homeomorphism. Construction techniques and properties of point-set topology, especially connectedness, compactness, and separation. Additional topics. This is the second course in a sequence of three: Mth 434, Mth 435, and Mth 436 which must be taken in sequence. Also offered for graduate-level credit as Mth 534 and may be taken only once for credit.

Prerequisite: Mth 311.

Mth 436 - Set Theory and Topology III (3)
Cardinal and ordinal numbers. The axiom of choice and equivalent formulations. Introduction to general topology with the notions of interior, closure, topological space, continuity, and homeomorphism. Construction techniques and properties of point-set topology, especially connectedness, compactness, and separation. Additional topics. This is the third course in a sequence of three: Mth 434, Mth 435, and Mth 436 which must be taken in sequence. Also offered for graduate-level credit as Mth 534 and may be taken only once for credit.

Prerequisite: Mth 311.

Mth 441 - Introduction to Abstract Algebra I (3)
Groups and rings with homomorphism theorems, vector spaces, modules, algebraic theory of fields and Galois theory, lattices, algebras. This is the first course in a sequence of three: Mth 441, Mth 442, and Mth 443 which must be taken in sequence. Also offered for graduate-level credit as Mth 541 and may be taken only once for credit.

Prerequisite: Mth 344.

Mth 442 - Introduction to Abstract Algebra II (3)
Groups and rings with homomorphism theorems, vector spaces, modules, algebraic theory of fields and Galois theory, lattices, algebras. This is the second course in a sequence of three: Mth 441, Mth 442, and Mth 443 which must be taken in sequence.

Mth 443 - Introduction to Abstract Algebra III (3)
Axiomatic treatment of Boolean algebras, finite Boolean algebras, representation theorems. Introduction to partially ordered sets and lattices. Transfinite induction, Zorn’s lemma. Applications to logic and switching circuits.

Prerequisite: Mth 344.

Mth 444 - Boolean Algebra (4)
Axiomatic treatment of Boolean algebras, finite Boolean algebras, representation theorems. Introduction to partially ordered sets and lattices. Transfinite induction, Zorn’s lemma. Applications to logic and switching circuits.

Prerequisite: Mth 344.
Also offered for graduate-level credit as Mth 542 and may be taken only once for credit.

Prerequisite: Mth 344.

Mth 443 - Introduction to Abstract Algebra III (3)

Groups and rings with homomorphism theorems, vector spaces, modules, algebraic theory of fields and Galois theory, lattices, algebras. This is the third course in a sequence of three: Mth 441, Mth 442, and Mth 443 which must be taken in sequence. Also offered for graduate-level credit as Mth 543 and may be taken only once for credit.

Prerequisite: Mth 344.

Mth 444 - Advanced Linear/Multilinear Algebra I (3)

A second course in linear algebra. Products, quotients, and duals of vector spaces. Multilinear maps, tensor products, exterior algebra. Minimal and characteristic polynomials, canonical forms. Finite dimensional spectral theory. This is the first course in a sequence of two: Mth 444 and Mth 445 which must be taken in sequence. Also offered for graduate-level credit as Mth 544 and with departmental approval, this sequence may be repeated for credit.

Prerequisite: Mth 344.

Mth 445 - Advanced Linear/Multilinear Algebra II (3)

A second course in linear algebra. Products, quotients, and duals of vector spaces. Multilinear maps, tensor products, exterior algebra. Minimal and characteristic polynomials, canonical forms. Finite dimensional spectral theory. This is the second course in a sequence of two: Mth 444 and Mth 445 which must be taken in sequence. Also offered for graduate-level credit as Mth 544 and with departmental approval, this sequence may be repeated for credit.

Prerequisite: Mth 344.

Mth 449 - Topics in Advanced Number Theory (3)

A study of advanced topics selected from the areas of algebraic or analytic theory. With departmental approval, this course may be repeated for credit. Also offered for graduate-level credit as Mth 549 and may be taken only once for credit.

Prerequisite: Mth 346.

Mth 451 - Numerical Calculus I (3)

Computer arithmetic. Solution of nonlinear equations. Interpolation. Numerical integration and differentiation. Solution of linear equation systems. Eigenvalue problem, least square, Chebyshev, trigonometric and rational function approximation. Numerical solution of differential equations. This is the first course in a sequence of three: Mth 451, Mth 452, and Mth 453 which must be taken in sequence. Also offered for graduate-level credit as Mth 551 and may be taken only once for credit.

Prerequisite: knowledge of a programming language such as MATLAB or C/C++, Mth 253 and Mth 261.

Mth 452 - Numerical Calculus II (3)

Computer arithmetic. Solution of nonlinear equations. Interpolation. Numerical integration and differentiation. Solution of linear equation systems. Eigenvalue problem, least square, Chebyshev, trigonometric and rational function approximation. Numerical solution of differential equations. This is the second course in a sequence of three: Mth 451, Mth 452, and Mth 453 which must be taken in sequence. Also offered for graduate-level credit as Mth 552 and may be taken only once for credit.

Prerequisite: knowledge of a programming language such as MATLAB or C/C++, Mth 253 and Mth 261.

Mth 453 - Numerical Calculus III (3)

Computer arithmetic. Solution of nonlinear equations. Interpolation. Numerical integration and differentiation. Solution of linear equation systems. Eigenvalue problem, least square, Chebyshev, trigonometric and rational function approximation. Numerical solution of differential equations. This is the third course in a sequence of three: Mth 451, Mth 452, and Mth 453 which must be taken in sequence. Also offered for graduate-level credit as Mth 553 and may be taken only once for credit.

Prerequisite: knowledge of a programming language such as MATLAB or C/C++, Mth 253 and Mth 261.

Mth 456 - Topics in Combinatorics (3)

Selected topics from: permutations, combinations, partitions, generating functions, inclusion/exclusion, recursion, Polya counting, block designs, orthogonal polynomials, and error-correcting codes. Also offered for graduate-level credit as Mth 556; with departmental approval may be repeated for credit.

Prerequisite: Mth 356 or CS 251.

Mth 457 - The Mathematical Theory of Games (3)

Introduction to mathematical game theory and game theoretic analysis. Topics include: combinatorial and strategic games, Perfect Competition, Zermelo’s Algorithm, Payoffs, cooperative and non-cooperative games, bargaining, mixed strategies, Nash Equilibrium, repeated games and finite automata, common knowledge and incomplete information, the prisoner’s dilemma. Selected applications to economics, biology, computer science, and political science. This is the first course in a sequence of two: Mth 457 and Mth 458. Also offered for graduate-level credit as Mth 557 and may be taken only once for credit.

Prerequisite: Mth 261 and/or Stat 243.

Mth 458 - The Mathematical Theory of Games (3)

Introduction to mathematical game theory and game theoretic analysis. Topics include: combinatorial and strategic games, Perfect Competition, Zermelo’s Algorithm, Payoffs, cooperative and non-cooperative games, bargaining, mixed strategies, Nash Equilibrium, repeated games and finite automata, common knowledge and incomplete information, the prisoner’s dilemma. Selected applications to economics, biology, computer science, and political science. This is the second course in a sequence of two: Mth 457 and Mth 458. Also offered for graduate-level credit as Mth 558 and may be taken only once for credit.

Prerequisite: Mth 261 and/or Stat 243.

Mth 461 - Graph Theory I (3)

Topics in graph theory, including connectivity, matchings, graph algorithms, network flows, graph matrices, isomorphisms, Eulerian and Hamiltonian graphs, spanning trees, decompositions, shortest paths, the matrix-tree theorem,
colorings of graphs, planarity and embeddings, Kuratowski's theorem, matroids, and selected applications. This is the first course in a sequence of two: Mth 461 and Mth 462 which must be taken in sequence. Also offered for graduate-level credit as Mth 561 and may be taken only once for credit.

Prerequisite: Mth 261, 356.

Mth 462 - Graph Theory II (3)
Topics in graph theory, including connectivity, matchings, graph algorithms, network flows, graph matrices, isomorphisms, Eulerian and Hamiltonian graphs, spanning trees, decompositions, shortest paths, the matrix-tree theorem, colorings of graphs, planarity and embeddings, Kuratowski's theorem, matroids, and selected applications. This is the second course in a sequence of two: Mth 461 and Mth 462 which must be taken in sequence. Also offered for graduate-level credit as Mth 562 and may be taken only once for credit.

Prerequisite: Mth 261, 356.

Mth 470 - Complex Analysis and Boundary Value Problems I (3)
Fundamental concepts of complex variables, partial differential equations and boundary value problems using Fourier series. This is the first course in a sequence of three: Mth 470, Mth 471, and Mth 472. Also offered for graduate-level credit as Mth 570 and may be taken only once for credit.

Prerequisite: Mth 254 and either 256 or 421.

Mth 471 - Complex Analysis and Boundary Value Problems II (3)
Fundamental concepts of complex variables, partial differential equations and boundary value problems using Fourier series. This is the second course in a sequence of three: Mth 470, Mth 471, and Mth 472. Also offered for graduate-level credit as Mth 571 and may be taken only once for credit.

Prerequisite: Mth 254 and either 256 or 421.

Mth 472 - Complex Analysis and Boundary Value Problems III (3)
Fundamental concepts of complex variables, partial differential equations and boundary value problems using Fourier series. This is the third course in a sequence of three: Mth 470, Mth 471, and Mth 472. Also offered for graduate-level credit as Mth 572 and may be taken only once for credit.

Prerequisite: Mth 254 and either 256 or 421.

Mth 477 - Mathematical Control Theory I (3)
Mathematical foundations of linear time invariant control systems. Controllability, observability, stabilizability, feedback. Elements of the calculus of variations and optimal control. Dynamic programming. Pontryagin maximum principle. Applications. This is the first course in a sequence of two: Mth 477 and Mth 478. Also offered for graduate-level credit as Mth 577 and may be taken only once for credit.

Prerequisite: Mth 256. Expected preparation: Mth 253, 254.

Mth 478 - Mathematical Control Theory II (3)
Mathematical foundations of linear time invariant control systems. Controllability, observability, stabilizability, feedback. Elements of the calculus of variations and optimal control. Dynamic programming. Pontryagin maximum principle. Applications. This is the second course in a sequence of two: Mth 477 and Mth 478. Also offered for graduate-level credit as Mth 578 and may be taken only once for credit.

Prerequisite: Mth 256. Expected preparation: Mth 253, 254.

Mth 480 - Systems Analysis: Calculus of Variations (3)
Basic problems of the calculus of variations. Euler equations. Lagrange conditions. Lagrange multipliers. Lagrange equations. Hamilton’s equations. Application to mechanical and electrical systems. Also offered for graduate-level credit as Mth 580 and may be taken only once for credit.

Prerequisite: Mth 256 or 422/522.

Mth 481 - Topics in Probability for Mathematics Teachers (3)
Introduction to probability as a modeling technique in mathematics and methods of teaching probability. Use of probability in decision making and inference. Simulation of experiments. Methods of enumeration. Laws of probability. Special probability distributions. Computer-assisted analysis. Also offered for graduate-level credit as Mth 581; with departmental approval may be repeated for credit.

Prerequisite: at least two upper-division courses approved for math major credit. Enrollment is limited to pre-service and in-service mathematics teachers or permission of instructor.

Mth 482 - Topics in Statistics for Mathematics Teachers (3)
Selected topics in probability for mathematics teachers. Also offered for graduate-level credit as Mth 582; with departmental approval may be repeated for credit.

Prerequisite: at least two upper-division courses approved for math major credit. Enrollment is limited to pre-service and in-service mathematics teachers or permission of instructor.

Mth 483 - Topics in Geometry for Mathematics Teachers (3)
Selected topics in geometry for mathematics teachers. Also offered for graduate-level credit as Mth 583; with departmental approval may be repeated for credit.

Prerequisite: at least two upper-division courses approved for major credit.

Mth 484 - Topics in Algebra for Mathematics Teachers (3)
Selected topics in algebra for mathematics teachers. Also offered for graduate-level credit as Mth 584; with departmental approval may be repeated for credit.

Prerequisite: at least two upper-division courses approved for major credit.

Mth 485 - Topics in Analysis for Mathematics Teachers (3)
Selected topics in analysis for mathematics teachers. Also offered for graduate-level credit as Mth 585; with departmental approval may be repeated for credit.

Prerequisite: at least two upper-division courses approved for major credit.
Mth 486 - Topics in The History of Mathematics (3)
Selected topics in the historical development of mathematics. Also offered for graduate-level credit as Mth 586; with departmental approval, this course may be repeated for credit.
Prerequisite: at least two upper-division courses approved for major credit.

Mth 487 - Topics in Discrete Mathematics for Mathematics Teachers (3)
Selected topics from: permutations and combinations, partitions, generating functions, inclusion and exclusion principles, recurrence relations, Polya's theory of counting, elementary theory of graphs and trees, block designs. Applications directed to teaching of Discrete Mathematics at the high school level. Also offered for graduate-level credit as Mth 587; with departmental approval may be repeated for credit.
Prerequisite: at least two upper-division courses approved for math major credit. Enrollment is limited to pre-service and in-service mathematics teachers or by permission of instructor.

Mth 488 - Topics in Computing for Mathematics Teachers (3)
Hands-on experience in the study of the role of computer software and calculators in the teaching and learning of mathematics. Also offered for graduate-level credit as Mth 588; with departmental approval may be repeated for credit.
Prerequisite: at least two upper-division courses approved for major credit.

Mth 490 - Computing in Mathematics for Middle School Teachers (3)
A study of the role of computing in mathematics with emphasis on the use of modern technology. Not approved for major credit. Available for graduate credit toward the graduate certificate program in middle school mathematics. Also offered for graduate-level credit as Mth 590 and may be taken only once for credit.
Prerequisite: Mth 112, 212, 213.

Mth 491 - Experimental Probability and Statistics for Middle School Teachers (3)
A study of probability and statistics through laboratory experiments, simulations, and applications. Not approved for major credit. Available for graduate credit toward the graduate certificate program in middle school mathematics. Also offered for graduate-level credit as Mth 591 and may be taken only once for credit.
Prerequisite: Mth 112, 212, 213.

Mth 492 - Problem Solving for Middle School Teachers (3)
Examination and application of problem-solving techniques and strategies. Problems are drawn from various areas of mathematics. Not approved for major credit. Available for graduate credit toward the graduate certificate program in middle school mathematics. Also offered for graduate-level credit as Mth 592 and may be taken only once for credit.
Prerequisite: Mth 112, Mth 212, Mth 213.

Mth 493 - Geometry for Middle School Teachers (3)
Selected topics from: Euclidean, coordinate, and non-Euclidean geometry. Not approved for major credit. Available for graduate credit toward the graduate certificate program in middle school mathematics. Also offered for graduate-level credit as Mth 593 and may be taken only once for credit.
Prerequisite: Mth 112, Mth 212, Mth 213.

Mth 494 - Arithmetic and Algebraic Structures for Middle School Teachers (3)
The study of the real number system and its subsystems will lead to the introduction of more general algebraic structures and their applications. Not approved for major credit. Available for graduate credit toward the graduate certificate program in middle school mathematics. Also offered for graduate-level credit as Mth 594 and may be taken only once for credit.
Prerequisite: Mth 112, Mth 212, Mth 213.

Mth 495 - Historical Topics in Mathematics for Middle School Teachers (3)
A survey of the historical development of topics in mathematics from ancient to modern times, with special emphasis on topics in arithmetic, algebra and informal geometry. Not approved for major credit. Available for graduate credit toward the graduate certificate program in middle school mathematics. Also offered for graduate-level credit as Mth 595 and may be taken only once for credit.
Prerequisite: Mth 493/593, Mth 494/594.

Mth 496 - Concepts of Calculus for Middle School Teachers (3)
An introduction to the limit concept and its role in defining the derivative, the integral and infinite series. Applications to middle school mathematics. Not approved for major credit. Available for graduate credit toward the graduate certificate program in middle school mathematics. Also offered for graduate-level credit as Mth 596 and may be taken only once for credit.
Prerequisite: at least two of the following courses: Mth 490/590, Mth 491/591, Mth 492/592, Mth 493/593, Mth 494/594.

Mth 497 - Mathematics in the Middle School Classroom (3)
A survey of mathematics taught in the middle school grades, with focus on both content and pedagogical recommendations of the National Council of Teachers of Mathematics. Not approved for major credit. Available for graduate credit toward the graduate certificate program in mathematics for middle school teachers. Also offered for graduate-level credit as Mth 597 and may be taken only once for credit.
Prerequisite: Mth 112, Mth 212, Mth 213.

Mth 501 - Research (1-9)
(Credit to be arranged.) Consent of instructor.

Mth 503 - Thesis (1-9)
(Credit to be arranged.)

Mth 504 - Cooperative Education/Internship (1-9)
(Credit to be arranged.)

Mth 505 - Reading and Conference (1-6)
(Credit to be arranged.) Consent of instructor.

Mth 507 - Seminar (1-6)
(Credit to be arranged.) Consent of instructor.

Mth 509 - Practicum (1-9)
(Credit to be arranged.)
Mth 510 - Selected Topics (1-6)
(Credit to be arranged.) Consent of instructor.

Mth 511 - Introduction to Real Analysis I (3)
Sequences and series of functions; Lebesgue measure and integration; the Stone-Weierstrass and Baire category theorems; Fourier Series; elements of functional analysis. This is the first course in a sequence of three: Mth 511, Mth 512 and Mth 513 which must be taken in sequence. Also offered for undergraduate-level credit as Mth 411 and may be taken only once for credit.
Prerequisite: Mth 312.

Mth 512 - Introduction to Real Analysis II (3)
Sequences and series of functions; Lebesgue measure and integration; the Stone-Weierstrass and Baire category theorems; Fourier Series; elements of functional analysis. This is the second course in a sequence of three: Mth 511, Mth 512 and Mth 513 which must be taken in sequence. Also offered for undergraduate-level credit as Mth 412 and may be taken only once for credit.
Prerequisite: Mth 312.

Mth 513 - Introduction to Real Analysis III (3)
Sequences and series of functions; Lebesgue measure and integration; the Stone-Weierstrass and Baire category theorems; Fourier Series; elements of functional analysis. This is the third course in a sequence of three: Mth 511, Mth 512 and Mth 513 which must be taken in sequence. Also offered for undergraduate-level credit as Mth 413 and may be taken only once for credit.
Prerequisite: Mth 312.

Mth 520 - Introduction to Complexity Theory (3)
An introduction to theoretical computer science. Includes a study of models of computation, complexity classes, Cook's theorem, polynomial and nonpolynomial classes, discrete problems.
Prerequisite: Mth 344.

Mth 521 - Theory of Ordinary Differential Equations I (3)
Vector fields and phase flows in the plane. Geometric and algebraic properties of linear systems. Existence, uniqueness, and continuity theorems for systems. Additional topics. This is the first course in a sequence of three: Mth 521, Mth 522, and Mth 523 which must be taken in sequence. Also offered for undergraduate-level credit as Mth 421 and may be taken only once for credit.
Prerequisite: Mth 312.

Mth 522 - Theory of Ordinary Differential Equations II (3)
Vector fields and phase flows in the plane. Geometric and algebraic properties of linear systems. Existence, uniqueness, and continuity theorems for systems. Additional topics. This is the second course in a sequence of three: Mth 521, Mth 522, and Mth 523 which must be taken in sequence. Also offered for undergraduate-level credit as Mth 422 and may be taken only once for credit.
Prerequisite: Mth 312.

Mth 523 - Theory of Ordinary Differential Equations III (3)
Vector fields and phase flows in the plane. Geometric and algebraic properties of linear systems. Existence, uniqueness, and continuity theorems for systems. Additional topics. This is the third course in a sequence of three: Mth 521, Mth 522, and Mth 523 which must be taken in sequence. Also offered for undergraduate-level credit as Mth 423 and may be taken only once for credit.
Prerequisite: Mth 312.

Mth 524 - Elementary Differential Geometry I (3)
Differential geometry of curves and surfaces; elementary Riemannian geometry; the Gauss-Bonnet theorem; applications from mechanics and field theory. This is the first course in a sequence of two: Mth 524 and Mth 525 which must be taken in sequence. Also offered for undergraduate-level credit as Mth 424 and may be taken only once for credit.
Prerequisite: Either Mth 421 or both Mth 254 and Mth 256.

Mth 525 - Elementary Differential Geometry II (3)
Differential geometry of curves and surfaces; elementary Riemannian geometry; the Gauss-Bonnet theorem; applications from mechanics and field theory. This is the second course in a sequence of two: Mth 424 and Mth 425 which must be taken in sequence. Also offered for undergraduate-level credit as Mth 525 and may be taken only once for credit.
Prerequisite: Either Mth 421 or both Mth 254 and Mth 256.

Mth 527 - Partial Differential Equations I (3)
Solution techniques, qualitative analysis and applications: separation of variables, eigenfunction expansion, Sturm-Liouville problems, Green's functions, Fourier transform solutions, finite difference and finite element methods. This is the first course in a sequence of two: Mth 527 and Mth 528 which must be taken in sequence. Also offered for undergraduate-level credit as Mth 427 and may be taken only once for credit.
Prerequisite: Mth 254, Mth 253/254. Prior knowledge of PDEs (Mth 322) is recommended, but not required.

Mth 528 - Partial Differential Equations II (3)
Solution techniques, qualitative analysis and applications: separation of variables, eigenfunction expansion, Sturm-Liouville problems, Green's functions, Fourier transform solutions, finite difference and finite element methods. This is the second course in a sequence of two: Mth 527 and Mth 528 which must be taken in sequence. Also offered for undergraduate-level credit as Mth 428 and may be taken only once for credit.
Prerequisite: Mth 256, Mth 253/254. Prior knowledge of PDEs (Mth 322) is recommended, but not required.

Mth 530 - Topics in Mathematical Modeling (3)
Basic introduction to mathematical model building starting with prototype, model purpose definition, and model validation. Models will be chosen from life, the physical and social sciences. Applications chosen from differential equations, linear programming, group theory, probability or...
other fields. Also offered for undergraduate-level credit as Mth 430.

Prerequisite: Consent of instructor and either Mth 256 or 421/521. With approval, this course may be repeated for credit.

Mth 531 - Topics in Geometry I (3)
Topics selected from projective geometry, non-Euclidean geometry, algebraic geometry, convexity, differential geometry, foundations of geometry, combinatorial topology. This is the first course in a sequence of three: Mth 531, Mth 532, and Mth 533; with departmental approval, this sequence may be repeated for credit. Also offered for undergraduate-level credit as Mth 431.

Prerequisite: Mth 311, Mth 338, or Mth 344.

Mth 532 - Topics in Geometry II (3)
Topics selected from projective geometry, non-Euclidean geometry, algebraic geometry, convexity, differential geometry, foundations of geometry, combinatorial topology. This is the second course in a sequence of three: Mth 531, Mth 532, and Mth 533; with departmental approval, this sequence may be repeated for credit. Also offered for undergraduate-level credit as Mth 432.

Prerequisite: Mth 311, Mth 338, or Mth 344.

Mth 533 - Topics in Geometry III (3)
Topics selected from projective geometry, non-Euclidean geometry, algebraic geometry, convexity, differential geometry, foundations of geometry, combinatorial topology. This is the third course in a sequence of three: Mth 531, Mth 532, and Mth 533; with departmental approval, this sequence may be repeated for credit. Also offered for undergraduate-level credit as Mth 433.

Prerequisite: Mth 311, Mth 338, or Mth 344.

Mth 534 - Set Theory and Topology I (3)
Cardinal and ordinal numbers. The axiom of choice and equivalent formulations. Introduction to general topology with the notions of interior, closure, topological space, continuity, and homeomorphism. Construction techniques and properties of point-set topology, especially connectedness, compactness, and separation. Additional topics. This is the first course in a sequence of three: Mth 534, Mth 535, and Mth 536 which must be taken in sequence. Also offered for undergraduate-level credit as Mth 434 and may be taken only once for credit.

Prerequisite: Mth 311.

Mth 535 - Set Theory and Topology II (3)
Cardinal and ordinal numbers. The axiom of choice and equivalent formulations. Introduction to general topology with the notions of interior, closure, topological space, continuity, and homeomorphism. Construction techniques and properties of point-set topology, especially connectedness, compactness, and separation. Additional topics. This is the second course in a sequence of three: Mth 534, Mth 535, and Mth 536 which must be taken in sequence. Also offered for undergraduate-level credit as Mth 435 and may be taken only once for credit.

Prerequisite: Mth 311.

Mth 536 - Set Theory and Topology III (3)
Cardinal and ordinal numbers. The axiom of choice and equivalent formulations. Introduction to general topology with the notions of interior, closure, topological space, continuity, and homeomorphism. Construction techniques and properties of point-set topology, especially connectedness, compactness, and separation. Additional topics. This is the third course in a sequence of three: Mth 534, Mth 535, and Mth 536 which must be taken in sequence. Also offered for undergraduate-level credit as Mth 436 and may be taken only once for credit.

Prerequisite: Mth 311.

Mth 540 - Boolean Algebra (4)
Axiomatic treatment of Boolean algebras, finite Boolean algebras, representation theorems. Introduction to partially ordered sets and lattices. Transfinite induction, Zorn’s lemma. Applications to logic and switching circuits.

Prerequisite: Mth 344.

Mth 541 - Introduction to Abstract Algebra I (3)
Groups and rings with homomorphism theorems, vector spaces, modules, algebraic theory of fields and Galois theory, lattices, algebras. This is the first course in a sequence of three: Mth 541, Mth 542, and Mth 543 which must be taken in sequence. Also offered for undergraduate-level credit as Mth 441 and may be taken only once for credit.

Prerequisite: Mth 344.

Mth 542 - Introduction to Abstract Algebra II (3)
Groups and rings with homomorphism theorems, vector spaces, modules, algebraic theory of fields and Galois theory, lattices, algebras. This is the second course in a sequence of three: Mth 541, Mth 542, and Mth 543 which must be taken in sequence. Also offered for undergraduate-level credit as Mth 442 and may be taken only once for credit.

Prerequisite: Mth 344.

Mth 543 - Introduction to Abstract Algebra III (3)
Groups and rings with homomorphism theorems, vector spaces, modules, algebraic theory of fields and Galois theory, lattices, algebras. This is the third course in a sequence of three: Mth 541, Mth 542, and Mth 543 which must be taken in sequence. Also offered for undergraduate-level credit as Mth 443 and may be taken only once for credit.

Prerequisite: Mth 344.

Mth 544 - Advanced Linear/Multilinear Algebra I (3)
A second course in linear algebra. Products, quotients, and duals of vector spaces. Multilinear maps, tensor products, exterior algebra. Minimal and characteristic polynomials, canonical forms. Finite dimensional spectral theory. This is the first course in a sequence of two: Mth 544 and Mth 545 which must be taken in sequence. Also offered for undergraduate-level credit as Mth 444 and with departmental approval, this sequence may be repeated for credit.

Prerequisite: Mth 344.

Mth 545 - Advanced Linear/Multilinear Algebra II (3)
A second course in linear algebra. Products, quotients, and duals of vector spaces. Multilinear maps, tensor products, exterior algebra. Minimal and characteristic polynomials, canonical forms. Finite dimensional spectral theory. This is the
second course in a sequence of two: Mth 544 and Mth 545 which must be taken in sequence. Also offered for undergraduate-level credit as Mth 445 and with departmental approval, this sequence may be repeated for credit.

Prerequisite: Mth 344.

Mth 549 - Topics in Advanced Number Theory (3)

A study of advanced topics selected from the areas of algebraic or analytic theory. With departmental approval, this course may be repeated for credit. Also offered for undergraduate-level credit as Mth 449 and may be taken only once for credit.

Prerequisite: Mth 346.

Mth 551 - Numerical Calculus I (3)

Computer arithmetic. Solution of nonlinear equations. Interpolation. Numerical integration and differentiation. Solution of linear equation systems. Eigenvector problem, least square, Chebyshev, trigonometric and rational function approximation. Numerical solution of differential equations. This is the first course in a sequence of three: Mth 551, Mth 552, and Mth 553 which must be taken in sequence. Also offered for undergraduate-level credit as Mth 451 and may be taken only once for credit.

Prerequisite: knowledge of a programming language such as MATLAB or C/C++, Mth 253 and Mth 261.

Mth 552 - Numerical Calculus II (3)

Computer arithmetic. Solution of nonlinear equations. Interpolation. Numerical integration and differentiation. Solution of linear equation systems. Eigenvector problem, least square, Chebyshev, trigonometric and rational function approximation. Numerical solution of differential equations. This is the second course in a sequence of three: Mth 551, Mth 552, and Mth 553 which must be taken in sequence. Also offered for undergraduate-level credit as Mth 452 and may be taken only once for credit.

Prerequisite: knowledge of a programming language such as MATLAB or C/C++, Mth 253 and Mth 261.

Mth 553 - Numerical Calculus III (3)

Computer arithmetic. Solution of nonlinear equations. Interpolation. Numerical integration and differentiation. Solution of linear equation systems. Eigenvector problem, least square, Chebyshev, trigonometric and rational function approximation. Numerical solution of differential equations. This is the third course in a sequence of three: Mth 551, Mth 552, and Mth 553 which must be taken in sequence. Also offered for undergraduate-level credit as Mth 453 and may be taken only once for credit.

Prerequisite: knowledge of a programming language such as MATLAB or C/C++, Mth 253 and Mth 261.

Mth 554 - Topics in Advanced Number Theory (3)

A study of advanced topics selected from the areas of algebraic or analytic theory. With departmental approval, this course may be repeated for credit. Also offered for undergraduate-level credit as Mth 449 and may be taken only once for credit.

Prerequisite: Mth 346.

Mth 555 - Topology (3)

Selected topics from: point-set topology, topological spaces, connectedness, compactness, metric spaces, completeness, separation axioms, Tychonoff's theorem, continuity, homotopy, fundamental group, covering spaces, lifting theorems, fixed point theorems. This is the second course in a sequence of two: Mth 555 and Mth 556. Also offered for undergraduate-level credit as Mth 455 and with departmental approval, this sequence may be repeated for credit.

Prerequisite: Mth 261 and/or Stat 243.

Mth 556 - Topics in Combinatorics (3)

Selected topics from: permutations, combinations, partitions, generating functions, inclusion/exclusion, recursion, Polya counting, block designs, orthogonal polynomials, and error-correcting codes. Also offered for undergraduate-level credit as Mth 456; with departmental approval, this sequence may be repeated for credit.

Prerequisite: Mth 356 or CS 251.

Mth 557 - The Mathematical Theory of Games (3)

Introduction to mathematical game theory and game theoretic analysis. Topics include: combinatorial and strategic games, Perfect Competition, Zermelo's Algorithm, Payoffs, cooperative and non-cooperative games, bargaining, mixed strategies, Nash Equilibrium, repeated games and finite automata, common knowledge and incomplete information, the prisoner's dilemma. Selected applications to economics, biology, computer science, and political science. This is the first course in a sequence of two: Mth 557 and Mth 558. Also offered for undergraduate-level credit as Mth 458 and may be taken only once for credit.

Prerequisite: Mth 261 and/or Stat 243.

Mth 558 - The Mathematical Theory of Games (3)

Introduction to mathematical game theory and game theoretic analysis. Topics include: combinatorial and strategic games, Perfect Competition, Zermelo's Algorithm, Payoffs, cooperative and non-cooperative games, barging, mixed strategies, Nash Equilibrium, repeated games and finite automata, common knowledge and incomplete information, the prisoner's dilemma. Selected applications to economics, biology, computer science, and political science. This is the second course in a sequence of two: Mth 557 and Mth 558. Also offered for undergraduate-level credit as Mth 458 and may be taken only once for credit.

Prerequisite: Mth 261 and/or Stat 243.

Mth 559 - Complex Analysis and Boundary Value Problems I (3)

Topics in graph theory, including connectivity, matchings, graph algorithms, network flows, graph matrices, isomorphisms, Eulerian and Hamiltonian graphs, spanning trees, decompositions, shortest paths, the matrix-tree theorem, colorings of graphs, planarity and embeddings, Kuratowski's theorem, matroids, and selected applications. This is the first course in a sequence of two: Mth 559 and Mth 560. Also offered for undergraduate-level credit as Mth 460 and may be taken only once for credit.

Prerequisite: Mth 261, 356.

Mth 560 - Graph Theory II (3)

Topics in graph theory, including connectivity, matchings, graph algorithms, network flows, graph matrices, isomorphisms, Eulerian and Hamiltonian graphs, spanning trees, decompositions, shortest paths, the matrix-tree theorem, colorings of graphs, planarity and embeddings, Kuratowski's theorem, matroids, and selected applications. This is the second course in a sequence of two: Mth 559 and Mth 560. Also offered for undergraduate-level credit as Mth 460 and may be taken only once for credit.

Prerequisite: Mth 261, 356.

Mth 570 - Complex Analysis and Boundary Value Problems I (3)

Fundamental concepts of complex variables, partial differential equations and boundary value problems using Fourier series. This is the first course in a sequence of three: Mth 570, Mth 571, and Mth 572. Also offered for undergraduate-level credit as Mth 470 and may be taken only once for credit.
Prerequisite: Mth 254 and either 256 or 421.

**Mth 571 - Complex Analysis and Boundary Value Problems II (3)**
Fundamental concepts of complex variables, partial differential equations and boundary value problems using Fourier series. This is the second course in a sequence of three: Mth 570, Mth 571, and Mth 572. Also offered for undergraduate-level credit as Mth 471 and may be taken only once for credit.

Prerequisite: Mth 254 and either 256 or 421.

**Mth 572 - Complex Analysis and Boundary Value Problems III (3)**
Fundamental concepts of complex variables, partial differential equations and boundary value problems using Fourier series. This is the third course in a sequence of three: Mth 570, Mth 571, and Mth 572. Also offered for undergraduate-level credit as Mth 472 and may be taken only once for credit.

Prerequisite: Mth 254 and either 256 or 421.

**Mth 577 - Mathematical Control Theory I (3)**
Mathematical foundations of linear time invariant control systems. Controllability, observability, stabilizability, feedback. Elements of the calculus of variations and optimal control. Dynamic programming. Pontryagin maximum principle. Applications. This is the first course in a sequence of two: Mth 577 and Mth 578. Also offered for undergraduate-level credit as Mth 477 and may be taken only once for credit.

Prerequisite: Mth 256. Expected preparation: Mth 253, 254.

**Mth 578 - Mathematical Control Theory II (3)**
Mathematical foundations of linear time invariant control systems. Controllability, observability, stabilizability, feedback. Elements of the calculus of variations and optimal control. Dynamic programming. Pontryagin maximum principle. Applications. This is the second course in a sequence of two: Mth 577 and Mth 578. Also offered for undergraduate-level credit as Mth 478 and may be taken only once for credit.

Prerequisite: Mth 256. Expected preparation: Mth 253, 254.

**Mth 580 - Systems Analysis: Calculus of Variations (3)**
Basic problems of the calculus of variations. Euler equations. Lagrange conditions. Lagrange multipliers. Lagrange equations. Hamilton’s equations. Application to mechanical and electrical systems. Also offered for undergraduate-level credit as Mth 480 and may be taken only once for credit.

Prerequisite: Mth 256 or 422/522.

**Mth 581 - Topics in Probability for Mathematics Teachers (2-3)**
Introduction to probability as a modeling technique in mathematics and methods of teaching probability. Use of probability in decision making and inference. Simulation of experiments. Methods of enumeration. Laws of probability. Special probability distributions. Computer-assisted analysis. Also offered for undergraduate-level credit as Mth 481; with departmental approval may be repeated for credit.

Prerequisite: at least two upper-division courses approved for math major credit. Enrollment is limited to pre-service and in-service mathematics teachers or permission of instructor.

**Mth 582 - Topics in Statistics for Mathematics Teachers (2-3)**
Introduction to methods of statistical analysis and methods for teaching statistics. Descriptive statistics, organization of data, sampling techniques, sampling distributions, methods of statistical inference, estimation, hypothesis testing, regression, and correlation. Computer-assisted analysis. Also offered for undergraduate-level credit as Mth 482; with departmental approval may be repeated for credit.

Prerequisite: at least two upper-division courses approved for math major credit. Enrollment is limited to pre-service and in-service mathematics teachers or permission of instructor.

**Mth 583 - Topics in Geometry for Mathematics Teachers (2-3)**
Selected topics in geometry for mathematics teachers. Also offered for undergraduate-level credit as Mth 483; with departmental approval may be repeated for credit.

Prerequisite: at least two upper-division courses approved for major credit.

**Mth 584 - Topics in Algebra for Mathematics Teachers (2-3)**
Selected topics in algebra for mathematics teachers. Also offered for undergraduate-level credit as Mth 484; with departmental approval may be repeated for credit.

Prerequisite: at least two upper-division courses approved for major credit.

**Mth 585 - Topics in Analysis for Mathematics Teachers (2-3)**
Selected topics in analysis for mathematics teachers. Also offered for undergraduate-level credit as Mth 485; with departmental approval may be repeated for credit.

Prerequisite: at least two upper-division courses approved for major credit.

**Mth 586 - Topics in The History of Mathematics (2-3)**
Selected topics in the historical development of mathematics. Also offered for undergraduate-level credit as Mth 486; with departmental approval, this course may be repeated for credit.

Prerequisite: at least two upper-division courses approved for major credit.

**Mth 587 - Topics in Discrete Mathematics for Mathematics Teachers (2-3)**
Selected topics from: permutations and combinations, partitions, generating functions, inclusion and exclusion principles, recurrence relations, Polya’s theory of counting, elementary theory of graphs and trees, block designs. Applications directed to teaching of Discrete Mathematics at the high school level. Also offered for undergraduate-level credit as Mth 487; with departmental approval may be repeated for credit.

Prerequisite: at least two upper-division courses approved for math major credit. Enrollment is limited to pre-service and in-service mathematics teachers or by permission of instructor.

**Mth 588 - Topics in Computing for Mathematics Teachers (1-3)**
Hands-on experience in the study of the role of computer software and calculators in the teaching and learning of mathematics. Also offered for undergraduate-level credit as
Mth 488; with departmental approval may be repeated for credit.

Prerequisite: at least two upper-division courses approved for major credit.

Mth 590 - Computing in Mathematics for Middle School Teachers (3)
A study of the role of computing in mathematics with emphasis on the use of modern technology. Not approved for major credit. Available for graduate credit toward the graduate certificate program in middle school mathematics. Also offered for undergraduate-level credit as Mth 490 and may be taken only once for credit.

Prerequisite: Mth 112, Mth 212, Mth 213.

Mth 591 - Experimental Probability and Statistics for Middle School Teachers (3)
A study of probability and statistics through laboratory experiments, simulations, and applications. Not approved for major credit. Available for graduate credit toward the graduate certificate program in middle school mathematics. Also offered for undergraduate-level credit as Mth 491 and may be taken only once for credit.

Prerequisite: Mth 112, Mth 212, Mth 213.

Mth 592 - Problem Solving for Middle School Teachers (3)
Examination and application of problem-solving techniques and strategies. Problems are drawn from various areas of mathematics. Not approved for major credit. Available for graduate credit toward the graduate certificate program in middle school mathematics. Also offered for undergraduate-level credit as Mth 492 and may be taken only once for credit.

Prerequisite: Mth 112, Mth 212, Mth 213.

Mth 593 - Geometry for Middle School Teachers (3)
Selected topics from informal geometry, both two- and three-dimensional. Not approved for major credit. Available for graduate credit toward the graduate certificate program in middle school mathematics. Also offered for undergraduate-level credit as Mth 493 and may be taken only once for credit.

Prerequisite: Mth 112, Mth 212, Mth 213.

Mth 594 - Arithmetic and Algebraic Structures for Middle School Teachers (3)
The study of the real number system and its subsystems will lead to the introduction of more general algebraic structures and their applications. Not approved for major credit. Available for graduate credit toward the graduate certificate program in middle school mathematics. Also offered for undergraduate-level credit as Mth 494 and may be taken only once for credit.

Prerequisite: Mth 112, Mth 212, Mth 213.

Mth 595 - Historical Topics in Mathematics for Middle School Teachers (3)
A survey of the historical development of topics in mathematics from ancient to modern times, with special emphasis on topics in arithmetic, algebra and informal geometry. Not approved for major credit. Available for graduate credit toward the graduate certificate program in middle school mathematics. Also offered for undergraduate-level credit as Mth 495 and may be taken only once for credit.

Prerequisite: Mth 493/593, Mth 494/594.

Mth 596 - Concepts of Calculus for Middle School Teachers (3)
An introduction to the limit concept and its role in defining the derivative, the integral and infinite series. Applications to middle school mathematics. Not approved for major credit. Available for graduate credit toward the graduate certificate program in middle school mathematics. Also offered for undergraduate-level credit as Mth 496 and may be taken only once for credit.

Prerequisite: at least two of the following courses: Mth 490/590, Mth 491/591, Mth 492/592, Mth 493/593, Mth 494/594.

Mth 597 - Mathematics in the Middle School Classroom (3)
A survey of mathematics taught in the middle school grades, with focus on both content and pedagogical recommendations of the National Council of Teachers of Mathematics. Not approved for major credit. Available for graduate credit toward the graduate certificate program in mathematics for middle school teachers. Also offered for undergraduate-level credit as Mth 497 and may be taken only once for credit.

Prerequisite: Mth 112, Mth 212, Mth 213.

Mth 598 - Modules for Middle School Teachers (3)
Courses designed to serve as modules that may be repeated for credit.

Prerequisite: Mth 412/512.

Mth 601 - Research (1-9)
(Credit to be arranged.)

Mth 603 - Dissertation (1-9)
(Credit to be arranged.)

Mth 604 - Cooperative Education/Internship (1-9)
(Credit to be arranged.)

Mth 605 - Reading and Conference (1-9)
(Credit to be arranged.)

Mth 606 - Special Projects (1-12)
(Credit to be arranged.)

Mth 607 - Seminar (1-9)
(Credit to be arranged.)

Mth 610 - Selected Topics (1-9)
(Credit to be arranged.)

Mth 611 - Theory of Functions of a Real Variable I (3)
Lebesgue measure and outer measure, measurable functions and the Lebesgue integral, convergence theorems, product measures, and Fubini’s theorem. Lp spaces, derivates, derivative, finite variation and absolutely continuous functions. Courses must be taken in sequence. Recommended prerequisite: Mth 412/512.

Mth 612 - Theory of Functions of a Real Variable II (3)
Lebesgue measure and outer measure, measurable functions and the Lebesgue integral, convergence theorems, product measures, and Fubini’s theorem. Lp spaces, derivates, derivative, finite variation and absolutely continuous functions. Courses must be taken in sequence. Recommended prerequisite: Mth 412/512.

Mth 613 - Theory of Functions of a Real Variable III (3)
Lebesgue measure and outer measure, measurable functions and the Lebesgue integral, convergence theorems, product measures, and Fubini’s theorem. Lp spaces, derivates, derivative, finite variation and absolutely continuous functions. Courses must be taken in sequence. Recommended prerequisite: Mth 412/512.

Mth 614 - Modern Analysis I (3)
Topics from nonlinear analysis, harmonic analysis, analytic functions, ordered vector
spaces, analysis on Lie groups, and operator theory. This is the first course in a sequence of three: Mth 614, Mth 615, and Mth 616. Recommended prerequisite: Mth 412/512.

Mth 615 - Modern Analysis II (3)
Topics from nonlinear analysis, harmonic analysis, analytic functions, ordered vector spaces, analysis on Lie groups, and operator theory. This is the second course in a sequence of three: Mth 614, Mth 615, and Mth 616. Recommended prerequisite: Mth 412/512.

Mth 616 - Modern Analysis III (3)
Topics from nonlinear analysis, harmonic analysis, analytic functions, ordered vector spaces, analysis on Lie groups, and operator theory. This is the third course in a sequence of three: Mth 614, Mth 615, and Mth 616. Recommended prerequisite: Mth 412/512.

Mth 617 - Functional Analysis I (3)
Hilbert and Banach spaces, the Hahn-Banach, open mapping, and closed graph theorems. Compact, self-adjoint, normal, and Fredholm operators. Locally convex spaces, weak topologies, duality. Banach and C*-algebras, spectral theory. This is the first course in a sequence of three: Mth 617, Mth 618, and Mth 619 which must be taken in sequence. Recommended prerequisite: Mth 412/512.

Mth 618 - Functional Analysis II (3)
Hilbert and Banach spaces, the Hahn-Banach, open mapping, and closed graph theorems. Compact, self-adjoint, normal, and Fredholm operators. Locally convex spaces, weak topologies, duality. Banach and C*-algebras, spectral theory. This is the second course in a sequence of three: Mth 617, Mth 618, and Mth 619 which must be taken in sequence. Recommended prerequisite: Mth 412/512.

Mth 619 - Functional Analysis III (3)
Hilbert and Banach spaces, the Hahn-Banach, open mapping, and closed graph theorems. Compact, self-adjoint, normal, and Fredholm operators. Locally convex spaces, weak topologies, duality. Banach and C*-algebras, spectral theory. This is the third course in a sequence of three: Mth 617, Mth 618, and Mth 619 which must be taken in sequence. Recommended prerequisite: Mth 412/512.

Mth 621 - Advanced Differential Equations I (3)
Advanced theory of dynamical systems and partial differential equations including the basics of partial differential equations, boundary value problems for elliptic equations, the Cauchy problem, and parabolic equations. Topics selected from Hamiltonian systems, waves and shocks, variational methods, control theory. This is the first course in a sequence of three: Mth 621, Mth 622, and Mth 623. Recommended prerequisite: Mth 423/523 or Mth 472/572.

Mth 622 - Advanced Differential Equations II (3)
Advanced theory of dynamical systems and partial differential equations including the basics of partial differential equations, boundary value problems for elliptic equations, the Cauchy problem, and parabolic equations. Topics selected from Hamiltonian systems, waves and shocks, variational methods, control theory. This is the second course in a sequence of three: Mth 621, Mth 622, and Mth 623. Recommended prerequisite: Mth 423/523 or Mth 472/572.

Mth 623 - Advanced Differential Equations III (3)
Advanced theory of dynamical systems and partial differential equations including the basics of partial differential equations, boundary value problems for elliptic equations, the Cauchy problem, and parabolic equations. Topics selected from Hamiltonian systems, waves and shocks, variational methods, control theory. This is the third course in a sequence of three: Mth 621, Mth 622, and Mth 623. Recommended prerequisite: Mth 423/523 or Mth 472/572.

Mth 624 - Advanced Differential Geometry I (3)
Topics selected from differentiable manifolds, differential forms, DeRham cohomology, Lie groups, fibre bundles, the Riemannian metric, affine and Riemannian connections, parallel translations, holonomy, geodesics, curvature, isometric embeddings and hypersurfaces, the Second Fundamental Form, complete Riemannian manifolds and the Hopf-Rinow theorem, spaces of constant curvature, variations of arc length, and the Morse Index theorem. This is the first course in a sequence of three: Mth 624, Mth 625, and Mth 626. Recommended prerequisite: Mth 425/525.

Mth 625 - Advanced Differential Geometry II (3)
Topics selected from differentiable manifolds, differential forms, DeRham cohomology, Lie groups, fibre bundles, the Riemannian metric, affine and Riemannian connections, parallel translations, holonomy, geodesics, curvature, isometric embeddings and hypersurfaces, the Second Fundamental Form, complete Riemannian manifolds and the Hopf-Rinow theorem, spaces of constant curvature, variations of arc length, and the Morse Index theorem. This is the second course in a sequence of three: Mth 624, Mth 625, and Mth 626. Recommended prerequisite: Mth 425/525.

Mth 626 - Advanced Differential Geometry III (3)
Topics selected from differentiable manifolds, differential forms, DeRham cohomology, Lie groups, fibre bundles, the Riemannian metric, affine and Riemannian connections, parallel translations, holonomy, geodesics, curvature, isometric embeddings and hypersurfaces, the Second Fundamental Form, complete Riemannian manifolds and the Hopf-Rinow theorem, spaces of constant curvature, variations of arc length, and the Morse Index theorem. This is the third course in a sequence of three: Mth 624, Mth 625, and Mth 626. Recommended prerequisite: Mth 425/525.

Mth 634 - Algebraic Topology I (3)
Topics from singular and simplicial homology and cohomology theories, fundamental group and covering spaces, CW complexes and elements of homotopy theory, algebraic theory of manifolds, introduction to differential topology and vector bundles, applications. This is the first course in a sequence of three: Mth 634, Mth 635, and Mth 636 which must be taken in sequence. Recommended prerequisites: Mth 435/535 and 444/544.

Mth 635 - Algebraic Topology II (3)
Topics from singular and simplicial homology and cohomology theories, fundamental group and covering spaces, CW complexes and elements of homotopy theory, algebraic theory of manifolds, introduction to differential topology and vector bundles, applications. This is the second course in a
Mth 634 - Modern Algebra I (3)
Topics from groups, semigroups, rings, fields, algebras, and homological algebra. This is the first course in a sequence of three: Mth 641, Mth 642, and Mth 643. Recommended prerequisite: Mth 443/543 or both Mth 442/542 and Mth 445/545.

Mth 635 - Modern Algebra II (3)
Topics from groups, semigroups, rings, fields, algebras, and homological algebra. This is the second course in a sequence of three: Mth 641, Mth 642, and Mth 643. Recommended prerequisite: Mth 443/543 or both Mth 442/542 and Mth 445/545.

Mth 636 - Modern Algebra III (3)
Topics from groups, semigroups, rings, fields, algebras, and homological algebra. This is the third course in a sequence of three: Mth 641, Mth 642, and Mth 643. Recommended prerequisite: Mth 443/543 or both Mth 442/542 and Mth 445/545.

Mth 637 - Geometric Topology I (3)
Topics from geometric and piecewise linear topology, knots and 3-manifolds and gauge theories, geometric structures and geometricization of manifolds, applications to differential topology, vector bundles and to mathematical physics. This is the first course in a sequence of three: Mth 637 Mth 638, and Mth 639. Recommended prerequisite: Mth 436/536.

Mth 638 - Geometric Topology II (3)
Topics from geometric and piecewise linear topology, knots and 3-manifolds and gauge theories, geometric structures and geometricization of manifolds, applications to differential topology, vector bundles and to mathematical physics. This is the second course in a sequence of three: Mth 637 Mth 638, and Mth 639. Recommended prerequisite: Mth 436/536.

Mth 639 - Geometric Topology III (3)
Topics from geometric and piecewise linear topology, knots and 3-manifolds and gauge theories, geometric structures and geometricization of manifolds, applications to differential topology, vector bundles and to mathematical physics. This is the third course in a sequence of three: Mth 637 Mth 638, and Mth 639. Recommended prerequisite: Mth 436/536.

Mth 641 - Modern Algebra I (3)
Topics from groups, semigroups, rings, fields, algebras, and homological algebra. This is the first course in a sequence of three: Mth 641, Mth 642, and Mth 643. Recommended prerequisite: Mth 443/543 or both Mth 442/542 and Mth 445/545.

Mth 642 - Modern Algebra II (3)
Topics from groups, semigroups, rings, fields, algebras, and homological algebra. This is the second course in a sequence of three: Mth 641, Mth 642, and Mth 643. Recommended prerequisite: Mth 443/543 or both Mth 442/542 and Mth 445/545.

Mth 643 - Modern Algebra III (3)
Topics from groups, semigroups, rings, fields, algebras, and homological algebra. This is the third course in a sequence of three: Mth 641, Mth 642, and Mth 643. Recommended prerequisite: Mth 443/543 or both Mth 442/542 and Mth 445/545.

Mth 651 - Advanced Numerical Analysis I (3)
An advanced study of numerical methods with emphasis on theory, economy of computation, and the solution of pathological problems. Topics will typically be chosen from: evaluation of functions, roots of equations, quadrature, ordinary and partial differential equations, integral equations, eigenvalues, construction of approximating functions, orthonormalizing codes, and treatment of singularities. This is the first course in a sequence of three: Mth 651, Mth 652, and Mth 653 which must be taken in sequence. Recommended prerequisite: Mth 453/553.

Mth 652 - Advanced Numerical Analysis II (3)
An advanced study of numerical methods with emphasis on theory, economy of computation, and the solution of pathological problems. Topics will typically be chosen from: evaluation of functions, roots of equations, quadrature, ordinary and partial differential equations, integral equations, eigenvalues, construction of approximating functions, orthonormalizing codes, and treatment of singularities. This is the second course in a sequence of three: Mth 651, Mth 652, and Mth 653 which must be taken in sequence. Recommended prerequisite: Mth 453/553.

Mth 653 - Advanced Numerical Analysis III (3)
An advanced study of numerical methods with emphasis on theory, economy of computation, and the solution of pathological problems. Topics will typically be chosen from: evaluation of functions, roots of equations, quadrature, ordinary and partial differential equations, integral equations, eigenvalues, construction of approximating functions, orthonormalizing codes, and treatment of singularities. This is the third course in a sequence of three: Mth 651, Mth 652, and Mth 653 which must be taken in sequence. Recommended prerequisite: Mth 453/553.
Mth 667 - Stochastic Processes and Probability Theory I (3)

Mth 668 - Stochastic Processes and Probability Theory II (3)

Mth 669 - Stochastic Processes and Probability Theory III (3)

Mth 690 - Curriculum in Mathematics Education (3)
An analysis of curriculum development and assessment efforts in mathematics education both past and present.

Mth 691 - Research on the Learning of Mathematics (3)
An analysis of the research on the learning of mathematics, including topics from K-16 mathematics.

Mth 692 - Research on the Teaching of Mathematics (3)
An analysis of the research on the teaching of mathematics, including issues from levels K-16.

Mth 693 - Topics in Research in Mathematics Education (3)
A special topics seminar devoted to exploring particular issues in more depth.

Mth 694 - Research on the Learning of Mathematics (3)
An analysis of the research on the teaching of mathematics, including topics from K-16 mathematics.

Mth 801 - Research (1-12)
(Credit to be arranged.)

Mth 802 - Independent Study (1-12)
(Credit to be arranged.)

Mth 804 - Cooperative Education/Internship (1-12)
(Credit to be arranged.)

Mth 805 - Reading and Conference (1-12)
(Credit to be arranged.)

Mth 806 - Special Problems/Projects (1-12)
(Credit to be arranged.)

Mth 807 - Seminar (1-12)
(Credit to be arranged.)

Mth 808 - Workshop (0-12)
(Credit to be arranged.)

Mth 809 - Practicum (1-12)
(Credit to be arranged.)

Mth 810 - Selected Topics (1-12)
(Credit to be arranged.)

MuEd - Music Education

MuEd 328 - Introduction to Music Education (2)
Overview of the music education profession, with emphasis on the various levels, genres, options, and requirements of the field. Concurrent enrollment in an appropriate practicum (Mus 409) required.

MuEd 332 - String Techniques (1)
Study of the stringed instrument family for students in the teacher education program. Special emphasis will be given to the teaching of these instruments to groups of young and/or inexperienced students.

MuEd 333 - Guitar Techniques (1)
Study of the guitar and the methods and materials used to teach guitar to young and/or inexperienced students. Required for students in the Music Education Program.

MuEd 334 - Vocal Techniques K-12 (1)
Study of vocal techniques for students in the teacher education program. Special emphasis will be given to teaching voice to groups of young and/or inexperienced students from childhood through high school.

MuEd 335 - Percussion Techniques (1)
Study of the percussion instruments of orchestra and band for students in the teacher education program. Special emphasis will be given to the teaching of these instruments to groups of young and/or inexperienced students.

MuEd 336 - Flute and Double Reeds (1)
Study of how to teach and play flute and double reeds (bassoon and oboe) for students enrolled in the teacher education program.

MuEd 337 - Clarinet and Saxophone (1)
Study of how to teach and play clarinet and saxophone for students enrolled in the teacher education program.

MuEd 338 - High Brass Techniques (1)
Study of how to teach and play trumpet and horn for students enrolled in the teacher education program.

MuEd 339 - Low Brass Techniques (1)
Study of how to teach and play trombone, euphonium and tuba for students enrolled in the teacher education program.
MuEd 340 - Wind Instrument Techniques (3)
For students in the Choral/General Music Education track. Techniques of brass and woodwind instruments for groups of young students with special emphasis on resources, beginning techniques, and appropriate literature.

MuEd 341 - Jazz Techniques (1)
Study of techniques used in the teaching of middle and high school instrumental jazz music. Includes rehearsal techniques, basic arranging, swing concepts, rhythm section concepts, and improvisation.
Prerequisite: instructor approval.

MuEd 399 - Special Studies (1-6)
(Credits to be arranged.)

MuEd 420 - Choral Literature and Rehearsal Techniques I (3)
Students will learn the essentials of rehearsing large choral groups from grades 6-12 and requisite materials and techniques for starting and building a choral program. Also offered for graduate-level credit as MuEd 520 and may be taken only once for credit. This is the first course in a sequence of two: MuEd 420 and MuEd 421.
Prerequisite: Mus 322, MuEd 328, MuEd 334.

MuEd 421 - Choral Literature and Rehearsal Techniques II (3)
Students will learn the essentials of rehearsing large choral groups from grades 6-12 and requisite materials and techniques for starting and building a choral program. Also offered for graduate-level credit as MuEd 521 and may be taken only once for credit. This is the second course in a sequence of two: MuEd 420 and MuEd 421.
Prerequisite: Mus 322, MuEd 328, MuEd 334.

MuEd 422 - Instrumental Literature and Rehearsal Techniques I (3)
Study of the literature and rehearsal techniques for teaching instrumental music in grades 5-8 primarily. Student will serve as a lab ensemble for each other and will play primary and secondary instruments. Score study, appropriate literature selection and administration of a middle school instrumental program are the core areas of study. Also offered for graduate-level credit as MuEd 522 and may be taken only once for credit.
Prerequisite: Mus 321, MuEd 328, 335 336, 337.

MuEd 423 - Instrumental Literature and Rehearsal Techniques II (3)
Study of the literature and rehearsal techniques for teaching instrumental music in grades 9-12, primarily. Student will serve as a lab ensemble for each other and will play primary and secondary instruments. Score study, appropriate literature selection and administration of a high school instrumental program are the core areas of study. Also offered for graduate-level credit as MuEd 523 and may be taken only once for credit.
Prerequisite: Mus 321, MuEd 328, MuEd 335, MuEd 336, MuEd 337, MuEd 422 or MuEd 522.

MuEd 480 - Kodály Training: Level I (5)
A two-week intensive introduction to the Kodály approach and its applications in the field of Music Education. Students will participate in pedagogy, folk music, musicianship, materials, and choir classes within the course. Also offered for graduate-level credit as MuEd 580 and may be taken only once for credit.
Prerequisite: junior standing.

MuEd 481 - Kodály Training: Level II (5)
A two-week continuation of the Kodály approach and its applications in the field of Music Education. Students will participate in pedagogy, folk music, musicianship, materials, conducting, and choir classes within the course. Also offered for graduate-level credit as MuEd 581 and may be taken only once for credit.
Prerequisite: MuEd 480 or MuEd 580 or other Kodály Level 1 coursework.

MuEd 482 - Kodály Training: Level III (5)
The third course in the Kodály approach and its applications in the field of Music Education. Students will participate in pedagogy, folk music, musicianship, materials, conducting, and choir classes within the course. Also offered for graduate-level credit as MuEd 582 and may be taken only once for credit.
Prerequisite: MuEd 481 or other Kodály Level II coursework.

MuEd 484 - Music with Children (3)
Methods and materials for teaching general music classes in the elementary school. Designed for the music specialist; required of all students who seek a basic teaching certificate in music. It is presupposed that all students have performing and theoretical skills and at least one year of music history. Concurrent enrollment in an appropriate practicum (Mus 409) required. Also offered for undergraduate-level credit as MuEd 584 and may be taken only once for credit.
Prerequisite: upper-division standing in music.

MuEd 508 - Workshop (1-9)
(Credit to be arranged.)

MuEd 520 - Choral Literature and Rehearsal Techniques I (3)
Students will learn the essentials of rehearsing large choral groups from grades 6-12 and requisite materials and techniques for starting and building a choral program. Also offered for undergraduate-level credit as MuEd 420 and may be taken only once for credit. This is the first course in a sequence of two: MuEd 520 and MuEd 521.
Prerequisite: Mus 322, MuEd 328, 334.

MuEd 521 - Choral Literature and Rehearsal Techniques II (3)
Students will learn the essentials of rehearsing large choral groups from grades 6-12 and requisite materials and techniques for starting and building a choral program. Also offered for undergraduate-level credit as MuEd 421 and may be taken only once for credit. This is the second course in a sequence of two: MuEd 520 and MuEd 521.
Prerequisite: Mus 322, MuEd 328, 334.

MuEd 522 - Choral Literature and Rehearsal Techniques II (3)
Students will learn the essentials of rehearsing large choral groups from grades 6-12 and requisite materials and techniques for starting and building a choral program. Also offered for undergraduate-level credit as MuEd 421 and may be taken only once for credit. This is the second course in a sequence of two: MuEd 520 and MuEd 521.
Prerequisite: Mus 322, MuEd 328, 334.

MuEd 523 - Choral Literature and Rehearsal Techniques II (3)
Students will learn the essentials of rehearsing large choral groups from grades 6-12 and requisite materials and techniques for starting and building a choral program. Also offered for undergraduate-level credit as MuEd 421 and may be taken only once for credit. This is the second course in a sequence of two: MuEd 520 and MuEd 521.
Prerequisite: Mus 322, MuEd 328, 334.

MuEd 522 - Instrumental Literature and Rehearsal Techniques I (3)
Study of the literature and rehearsal techniques for teaching instrumental music in grades 5-8 primarily. Student will serve as a lab ensemble for each other and will play primary and secondary instruments. Score study, appropriate literature selection and administration of a middle school instrumental program are the core areas of study. Also offered for graduate-level credit as MuEd 522 and may be taken only once for credit.
Prerequisite: MuEd 481 or MuEd 581 or other Kodály Level II coursework.

MuEd 524 - Music with Children (3)
Methods and materials for teaching general music classes in the elementary school. Designed for the music specialist; required of all students who seek a basic teaching certificate in music. It is presupposed that all students have performing and theoretical skills and at least one year of music history. Concurrent enrollment in an appropriate practicum (Mus 409) required. Also offered for undergraduate-level credit as MuEd 584 and may be taken only once for credit.
Prerequisite: upper-division standing in music.

MuEd 508 - Workshop (1-9)
(Credit to be arranged.)
study. Also offered for undergraduate-level credit as MuEd 422 and may be taken only once for credit.

**Prerequisite:** Mus 321, MuEd 328, 335 336, 337.

**MuEd 523 - Instrumental Literature and Rehearsal Techniques II (3)**

Study of the literature and rehearsal techniques for teaching instrumental music in grades 9-12, primarily. Student will serve as a lab ensemble for each other and will play primary and secondary instruments. Score study, appropriate literature selection and administration of a high school instrumental program are the core areas of study. Also offered for undergraduate-level credit as MuEd 423 and may be taken only once for credit.

**Prerequisite:** Mus 321, MuEd 328, MuEd 335, MuEd 336, MuEd 337, MuEd 422 or MuEd 522.

**MuEd 530 - Managing the Music Classroom (2)**

Focus on classroom management techniques specific to music classrooms in k-12 schools, both large ensembles and general music courses. Students will research and problem-solve challenges in these unique classes.

**MuEd 580 - Kodály Training: Level I (5)**

A two-week intensive introduction to the Kodály approach and its applications in the field of Music Education. Students will participate in pedagogy, folk music, musicianship, materials, conducting, and choir classes within the course. Also offered for undergraduate-level credit as MuEd 480 and may be taken only once for credit.

**Prerequisite:** junior standing.

**MuEd 581 - Kodály Training: Level II (5)**

A two-week continuation of the Kodály approach and its applications in the field of Music Education. Students will participate in pedagogy, folk music, musicianship, materials, conducting, and choir classes within the course. Also offered for undergraduate-level credit as MuEd 481 and may be taken only once for credit.

**Prerequisite:** MuEd 480 or MuEd 580 or other Kodály Level 1 coursework.

**MuEd 582 - Kodály Training: Level III (5)**

The third course in the Kodály approach and its applications in the field of Music Education. Students will participate in pedagogy, folk music, musicianship, materials, conducting, and choir classes within the course. Also offered for undergraduate-level credit as MuEd 482 and may be taken only once for credit.

**Prerequisite:** MuEd 481 or MuEd 581 or other Kodály Level II coursework.

**MuEd 583 - Kodály Training: Level IV (5)**

The final course in the Kodály approach and its applications in the field of Music Education. Students will prepare a dvd of their teaching and present their projects/dvds for evaluation as well as participate in pedagogy, folk music, musicianship, materials, conducting, and choir classes within the course.

**Prerequisite:** MuEd 482/582 or other Kodály Level III coursework.

**MuEd 584 - Music with Children (3)**

Methods and materials for teaching general music classes in the elementary school. Designed for the music specialist; required of all students who seek a basic teaching certificate in music. It is presupposed that all students have performing and theoretical skills and at least one year of music history. Concurrent enrollment in an appropriate practicum (Mus 409) required. Also offered for undergraduate-level credit as MuEd 484 and may be taken only once for credit.

**Prerequisite:** upper-division standing in music.

**Mup - Applied Music**

**Mup 190 - Applied Music: Trombone (1-4)**

Freshman year. Individual instruction in organ, piano, harpsichord, voice, guitar, orchestral and band instruments. Maximum: 12 credits.

**Prerequisite:** approval of faculty applied music supervisor. Corequisite: Mus 195.

**Mup 190B - Applied Music: Bass (1-4)**

Freshman year. Individual instruction in organ, piano, harpsichord, voice, guitar, orchestral and band instruments. Maximum: 12 credits.

**Prerequisite:** approval of faculty applied music supervisor.

**Mup 190C - Applied Music: Cello (1-4)**

Freshman year. Individual instruction in organ, piano, harpsichord, voice, guitar, orchestral and band instruments. Maximum: 12 credits.

**Prerequisite:** approval of faculty applied music supervisor. Corequisite: Mus 196.

**Mup 190D - Applied Music: Percussion (1-4)**

Freshman year. Individual instruction in organ, piano, harpsichord, voice, guitar, orchestral and band instruments. Maximum: 12 credits.

**Prerequisite:** approval of faculty applied music supervisor. Corequisite: Mus 195.

**Mup 190E - Applied Music: Early Instruments (1-4)**

Freshman year. Individual instruction in organ, piano, harpsichord, voice, guitar, orchestral and band instruments. Maximum: 12 credits.

**Prerequisite:** approval of faculty applied music supervisor. Corequisite: Mus 197.

**Mup 190F - Applied Music: French Horn (1-4)**

Freshman year. Individual instruction in organ, piano, harpsichord, voice, guitar, orchestral and band instruments. Maximum: 12 credits.

**Prerequisite:** approval of faculty applied music supervisor. Corequisite: Mus 195.

**Mup 190G - Applied Music: Guitar (1-4)**

Freshman year. Individual instruction in organ, piano, harpsichord, voice, guitar, orchestral and band instruments. Maximum: 12 credits.

**Prerequisite:** approval of faculty applied music supervisor. Corequisite: Mus 185.
Mup 190H - Applied Music: Harpsichord/Organ (1-4)
Freshman year. Individual instruction in organ, piano, harpsichord, voice, guitar, orchestral and band instruments. Maximum: 12 credits.
Prerequisite: approval of faculty applied music supervisor. Corequisite: Mus 197.

Mup 190I - Applied Music: Flute (1-4)
Freshman year. Individual instruction in organ, piano, harpsichord, voice, guitar, orchestral and band instruments. Maximum: 12 credits.
Prerequisite: Prerequisite: approval of faculty applied music supervisor.
Corequisite: Mus 197.

Mup 190J - Applied Music: Jazz Studies (1-4)
Freshman year. Individual instruction in organ, piano, harpsichord, voice, guitar, orchestral and band instruments. Maximum: 12 credits.
Prerequisite: approval of faculty applied music supervisor. Corequisite: Mus 195.

Mup 190K - Applied Music: Clarinet (1-4)
Freshman year. Individual instruction in organ, piano, harpsichord, voice, guitar, orchestral and band instruments. Maximum: 12 credits.
Prerequisite: approval of faculty applied music supervisor. Corequisite: Mus 195.

Mup 190L - Applied Music: Bassoon (1-4)
Freshman year. Individual instruction in organ, piano, harpsichord, voice, guitar, orchestral and band instruments. Maximum: 12 credits.
Prerequisite: approval of faculty applied music supervisor. Corequisite: Mus 195.

Mup 190M - Applied Music: Composition (1-4)
Freshman year. Individual instruction in organ, piano, harpsichord, voice, guitar, orchestral and band instruments. Maximum: 12 credits.
Prerequisite: approval of faculty applied music supervisor. Corequisite: Mus 185.

Mup 190N - Applied Music: Non-Western (1-2)
Freshman year. Individual instruction in organ, piano, harpsichord, voice, guitar, orchestral and band instruments. Maximum: 12 credits.
Prerequisite: approval of faculty applied music supervisor.

Mup 190O - Applied Music: Oboe (1-4)
Freshman year. Individual instruction in organ, piano, harpsichord, voice, guitar, orchestral and band instruments. Maximum: 12 credits.
Prerequisite: approval of faculty applied music supervisor.
Corequisite: Mus 195.

Mup 190P - Applied Music: Piano (1-4)
Freshman year. Individual instruction in organ, piano, harpsichord, voice, guitar, orchestral and band instruments. Maximum: 12 credits.
Prerequisite: approval of faculty applied music supervisor. Corequisite: Mus 197.

Mup 190Q - Applied Music: Harp (1-4)
Freshman year. Individual instruction in organ, piano, harpsichord, voice, guitar, orchestral and band instruments. Maximum: 12 credits.
Prerequisite: approval of faculty applied music supervisor. Corequisite: Mus 197.

Mup 190S - Applied Music: Violin (1-4)
Freshman year. Individual instruction in organ, piano, harpsichord, voice, guitar, orchestral and band instruments. Maximum: 12 credits.
Prerequisite: approval of faculty applied music supervisor. Corequisite: Mus 197.

Mup 190T - Applied Music: Trumpet (1-4)
Freshman year. Individual instruction in organ, piano, harpsichord, voice, guitar, orchestral and band instruments. Maximum: 12 credits.
Prerequisite: approval of faculty applied music supervisor. Corequisite: Mus 195.

Mup 190U - Applied Music: Trombone (1-4)
Freshman year. Individual instruction in organ, piano, harpsichord, voice, guitar, orchestral and band instruments. Maximum: 12 credits.
Prerequisite: approval of faculty applied music supervisor. Corequisite: Mus 195.

Mup 190V - Applied Music: Voice (1-4)
Freshman year. Individual instruction in organ, piano, harpsichord, voice, guitar, orchestral and band instruments. Maximum: 12 credits.
Prerequisite: approval of faculty applied music supervisor. Corequisite: Mus 197.

Mup 190W - Applied Music: Violin Non-Western (1-2)
Freshman year. Individual instruction in organ, piano, harpsichord, voice, guitar, orchestral and band instruments. Maximum: 12 credits.
Prerequisite: approval of faculty applied music supervisor.
Corequisite: Mus 195.

Mup 190Y - Applied Music: Viola (1-4)
Freshman year. Individual instruction in organ, piano, harpsichord, voice, guitar, orchestral and band instruments. Maximum: 12 credits.
Prerequisite: approval of faculty applied music supervisor. Corequisite: Mus 195.

Mup 190Z - Applied Music: Saxophone (1-4)
Freshman year. Individual instruction in organ, piano, harpsichord, voice, guitar, orchestral and band instruments. Maximum: 12 credits.
Prerequisite: approval of faculty applied music supervisor. Corequisite: Mus 196.

Mup 190A - Applied Music: Trombone (1-4)
Sophomore year. Continuation of MuP 190. Maximum: 12 credits.
Prerequisite: MuP 190 and audition. Corequisite: Mus 195.

Mup 190B - Applied Music: Bassoon (1-4)
Sophomore year. Continuation of MuP 190. Maximum: 12 credits.
Prerequisite: MuP 190 and audition. Corequisite: Mus 196.
Prerequisite: MuP 190 and audition.
Corequisite: Mus 195.

Mup 290B - Applied Music: Bass (1-4)
Sophomore year. Continuation of MuP 190. Maximum: 12 credits.
Prerequisite: MuP 190 and audition.

Mup 290C - Applied Music: Cello (1-4)
Sophomore year. Continuation of MuP 190. Maximum: 12 credits.
Prerequisite: MuP 190 and audition.
Corequisite: Mus 196.

Mup 290D - Applied Music: Percussion (1-4)
Sophomore year. Continuation of MuP 190. Maximum: 12 credits.
Prerequisite: MuP 190 and audition.
Corequisite: Mus 195.

Mup 290E - Applied Music: Early Instruments (1-4)
Sophomore year. Continuation of MuP 190. Maximum: 12 credits.
Prerequisite: MuP 190 and audition.
Corequisite: Mus 197.

Mup 290F - Applied Music: French Horn (1-4)
Sophomore year. Continuation of MuP 190. Maximum: 12 credits.
Prerequisite: MuP 190 and audition.
Corequisite: Mus 195.

Mup 290G - Applied Music: Guitar (1-4)
Sophomore year. Continuation of MuP 190. Maximum: 12 credits.
Prerequisite: MuP 190 and audition.
Corequisite: Mus 185.

Mup 290H - Applied Music: Harpsichord/Organ (1 - 4)
Sophomore year. Continuation of MuP 190. Maximum: 12 credits.
Prerequisite: Prerequisites: MuP 190 and audition. Corequisite: Mus 197.

Mup 290I - Applied Music: Flute (1-4)
Sophomore year. Continuation of MuP 190. Maximum: 12 credits.
Prerequisite: MuP 190 and audition.
Corequisite: Mus 195.

Mup 290J - Applied Music: Jazz Studies (1-4)
Sophomore year. Continuation of MuP 190. Maximum: 12 credits.
Prerequisite: MuP 190 and audition.
Corequisite: Mus 195.

Mup 290K - Applied Music: Clarinet (1-4)
Sophomore year. Continuation of MuP 190. Maximum: 12 credits.
Prerequisite: MuP 190 and audition.
Corequisite: Mus 195.

Mup 290L - Applied Music: Bassoon (1-4)
Sophomore year. Continuation of MuP 190. Maximum: 12 credits.
Prerequisite: MuP 190 and audition.
Corequisite: Mus 195.

Mup 290M - Applied Music: Composition (1-4)
Sophomore year. Continuation of MuP 190. Maximum: 12 credits.
Prerequisite: MuP 190 and audition.
Corequisite: Mus 195.

Mup 290N - Applied Music: Oboe (1-4)
Sophomore year. Continuation of MuP 190. Maximum: 12 credits.
Prerequisite: MuP 190 and audition.
Corequisite: Mus 185.

Mup 290O - Applied Music: Harp (1-4)
Sophomore year. Continuation of MuP 190. Maximum: 12 credits.
Prerequisite: MuP 190 and audition.
Corequisite: Mus 197.

Mup 290P - Applied Music: Violin (1-4)
Sophomore year. Continuation of MuP 190. Maximum: 12 credits.
Prerequisite: MuP 190 and audition.
Corequisite: Mus 197.

Mup 290Q - Applied Music: Harp (1-4)
Sophomore year. Continuation of MuP 190. Maximum: 12 credits.
Prerequisite: MuP 190 and audition.
Corequisite: Mus 197.

Mup 290R - Applied Music: Violin (1-4)
Sophomore year. Continuation of MuP 190. Maximum: 12 credits.
Prerequisite: MuP 190 and audition.
Corequisite: Mus 197.

Mup 290S - Applied Music: Harpsichord/Organ (1-4)
Sophomore year. Continuation of MuP 190. Maximum: 12 credits.
Prerequisite: Prerequisites: MuP 190 and audition. Corequisite: Mus 197.

Mup 290T - Applied Music: Trumpet (1-4)
Sophomore year. Continuation of MuP 190. Maximum: 12 credits.
Prerequisite: MuP 190 and audition.
Corequisite: Mus 195.

Mup 290U - Applied Music: Trombone (1-4)
Sophomore year. Continuation of MuP 190. Maximum: 12 credits.
Prerequisite: MuP 190 and audition.
Corequisite: Mus 195.

Mup 290V - Applied Music: Voice (1-4)
Sophomore year. Continuation of MuP 190. Maximum: 12 credits.
Prerequisite: MuP 190 and audition.
Corequisite: Mus 197.

Mup 290W - Applied Music: Tuba (1-4)
Sophomore year. Continuation of MuP 190. Maximum: 12 credits.
Prerequisite: MuP 190 and audition.
Corequisite: Mus 195.

Mup 290X - Applied Music: Euphonium (1-4)
Sophomore year. Continuation of MuP 190. Maximum: 12 credits.
Prerequisite: MuP 190 and audition.
Corequisite: Mus 195.

Mup 290Y - Applied Music: Viola (1-4)
Sophomore year. Continuation of MuP 190. Maximum: 12 credits.
Prerequisite: MuP 190 and audition.
Corequisite: Mus 195.

Mup 390 - Applied Music: Trombone (1-4)
Junior year. Continuation of MuP 290. Maximum: 12 credits.
Prerequisite: MuP 290 and upper division examination. Corequisite: Mus 395.

Mup 390A - Applied Music: Trombone (1-4)
Junior year. Continuation of MuP 290. Maximum: 12 credits.
Prerequisite: MuP 290 and upper division examination. Corequisite: Mus 395.
Mup 390B - Applied Music: Bass (1-4)
Junior year. Continuation of MuP 290. Maximum: 12 credits.
Prerequisite: MuP 290 and upper division examination.

Mup 390C - Applied Music: Cello (1-4)
Junior year. Continuation of MuP 290. Maximum: 12 credits.
Prerequisite: MuP 290 and upper division examination. Corequisite: Mus 396.

Mup 390D - Applied Music: Percussion (1-4)
Junior year. Continuation of MuP 290. Maximum: 12 credits.
Prerequisite: MuP 290 and upper division examination. Corequisite: Mus 395.

Mup 390E - Applied Music: Early Instruments (1-4)
Junior year. Continuation of MuP 290. Maximum: 12 credits.
Prerequisite: MuP 290 and upper division examination. Corequisite: Mus 397.

Mup 390F - Applied Music: French Horn (1-4)
Junior year. Continuation of MuP 290. Maximum: 12 credits.
Prerequisite: MuP 290 and upper division examination. Corequisite: Mus 395.

Mup 390G - Applied Music: Guitar (1-4)
Junior year. Continuation of MuP 290. Maximum: 12 credits.
Prerequisite: MuP 290 and upper division examination. Corequisite: Mus 385.

Mup 390H - Applied Music: Harpsichord/Organ (1 - 4)
Junior year. Continuation of MuP 290. Maximum: 12 credits.
Prerequisite: Prerequisites: MuP 290 and upper division examination. Corequisite: Mus 397.

Mup 390I - Applied Music: Flute (1-4)
Junior year. Continuation of MuP 290. Maximum: 12 credits.
Prerequisite: MuP 290 and upper division examination. Corequisite: Mus 395.

Mup 390J - Applied Music: Jazz Studies (1-4)
Junior year. Continuation of MuP 290. Maximum: 12 credits.
Prerequisite: MuP 290 and upper division examination. Corequisite: Mus 395.

Mup 390K - Applied Music: Clarinet (1-4)
Junior year. Continuation of MuP 290. Maximum: 12 credits.
Prerequisite: MuP 290 and upper division examination. Corequisite: Mus 395.

Mup 390L - Applied Music: Bassoon (1-4)
Junior year. Continuation of MuP 290. Maximum: 12 credits.
Prerequisite: MuP 290 and upper division examination. Corequisite: Mus 395.

Mup 390M - Applied Music: Composition (1-4)
Junior year. Continuation of MuP 290. Maximum: 12 credits.
Prerequisite: MuP 290 and upper division examination. Corequisite: Mus 385.

Mup 390N - Applied Music: Oboe (1-4)
Junior year. Continuation of MuP 290. Maximum: 12 credits.
Prerequisite: MuP 290 and upper division examination. Corequisite: Mus 395.

Mup 390P - Applied Music: Piano (1-4)
Junior year. Continuation of MuP 290. Maximum: 12 credits.
Prerequisite: MuP 290 and upper division examination. Corequisite: Mus 397.

Mup 390Q - Applied Music: Harp (1-4)
Junior year. Continuation of MuP 290. Maximum: 12 credits.
Prerequisite: MuP 290 and upper division examination. Corequisite: Mus 397.

Mup 390R - Applied Music: Saxophone (1-4)
Junior year. Continuation of MuP 290. Maximum: 12 credits.
Prerequisite: MuP 290 and upper division examination. Corequisite: Mus 395.

Mup 390S - Applied Music: Trombone (1-4)
Junior year. Continuation of MuP 290. Maximum: 12 credits.
Prerequisite: MuP 290 and upper division examination. Corequisite: Mus 395.

Mup 390T - Applied Music: Trumpet (1-4)
Junior year. Continuation of MuP 290. Maximum: 12 credits.
Prerequisite: MuP 290 and upper division examination. Corequisite: Mus 395.

Mup 390U - Applied Music: Trombone (1-4)
Junior year. Continuation of MuP 290. Maximum: 12 credits.
Prerequisite: MuP 290 and upper division examination. Corequisite: Mus 395.

Mup 390V - Applied Music: Voice (1-4)
Junior year. Continuation of MuP 290. Maximum: 12 credits.
Prerequisite: MuP 290 and upper division examination. Corequisite: Mus 397.

Mup 390W - Applied Music: Tuba (1-4)
Junior year. Continuation of MuP 290. Maximum: 12 credits.
Prerequisite: MuP 290 and upper division examination. Corequisite: Mus 395.

Mup 390X - Applied Music: Euphonium (1-4)
Junior year. Continuation of MuP 290. Maximum: 12 credits.
Prerequisite: MuP 290 and upper division examination. Corequisite: Mus 395.

Mup 390Y - Applied Music: Viola (1-4)
Junior year. Continuation of MuP 290. Maximum: 12 credits.
Prerequisite: MuP 290 and upper division examination. Corequisite: Mus 396.

Mup 390Z - Applied Music: Saxophone (1-4)
Junior year. Continuation of MuP 290. Maximum: 12 credits.
Prerequisite: MuP 290 and upper division examination. Corequisite: Mus 395.

Mup 490 - Applied Music: Trombone (1-4)
Senior year. Continuation of MuP 390. Maximum: 12 credits.
Prerequisite: MuP 390 and audition. Corequisite: Mus 395.
Mup 490B - Applied Music: Bass (1-4)
Senior year. Continuation of MuP 390. Maximum: 12 credits.
Prerequisite: MuP 390 and audition.
Mup 490C - Applied Music: Cello (1-4)
Senior year. Continuation of MuP 390. Maximum: 12 credits.
Prerequisite: MuP 390 and audition.
Corequisite: Mus 396.
Mup 490D - Applied Music: Percussion (1-4)
Senior year. Continuation of MuP 390. Maximum: 12 credits.
Prerequisite: MuP 390 and audition.
Corequisite: Mus 395.
Mup 490E - Applied Music: Early Instruments (1-4)
Senior year. Continuation of MuP 390. Maximum: 12 credits.
Prerequisite: MuP 390 and audition.
Corequisite: Mus 397.
Mup 490F - Applied Music: French Horn (1-4)
Senior year. Continuation of MuP 390. Maximum: 12 credits.
Prerequisite: MuP 390 and audition.
Corequisite: Mus 385.
Mup 490G - Applied Music: Guitar (1-4)
Senior year. Continuation of MuP 390. Maximum: 12 credits.
Prerequisite: MuP 390 and audition.
Corequisite: Mus 395.
Mup 490H - Applied Music: Harpsichord/Organ (1 - 4)
Senior year. Continuation of MuP 390. Maximum: 12 credits.
Prerequisite: Prerequisites: MuP 390 and audition. Corequisite: Mus 397.
Mup 490I - Applied Music: Flute (1-4)
Senior year. Continuation of MuP 390. Maximum: 12 credits.
Prerequisite: MuP 390 and audition.
Corequisite: Mus 395.
Mup 490J - Applied Music: Jazz Studies (1-4)
Senior year. Continuation of MuP 390. Maximum: 12 credits.
Prerequisite: MuP 390 and audition.
Corequisite: Mus 385.
Mup 490K - Applied Music: Clarinet (1-4)
Senior year. Continuation of MuP 390. Maximum: 12 credits.
Prerequisite: MuP 390 and audition.
Corequisite: Mus 395.
Mup 490L - Applied Music: Bassoon (1-4)
Senior year. Continuation of MuP 390. Maximum: 12 credits.
Prerequisite: MuP 390 and audition.
Corequisite: Mus 395.
Mup 490M - Applied Music: Composition (1-4)
Senior year. Continuation of MuP 390. Maximum: 12 credits.
Prerequisite: MuP 390 and audition.
Corequisite: Mus 385.
Mup 490N - Applied Music: Oboe (1-4)
Senior year. Continuation of MuP 390. Maximum: 12 credits.
Prerequisite: MuP 390 and audition.
Corequisite: Mus 395.
Mup 490P - Applied Music: Piano (1-4)
Senior year. Continuation of MuP 390. Maximum: 12 credits.
Prerequisite: MuP 390 and audition.
Corequisite: Mus 397.
Mup 490Q - Applied Music: Harp (1-4)
Senior year. Continuation of MuP 390. Maximum: 12 credits.
Prerequisite: MuP 390 and audition.
Corequisite: Mus 397.
Mup 490R - Applied Music: Violin (1-4)
Senior year. Continuation of MuP 390. Maximum: 12 credits.
Prerequisite: MuP 390 and audition.
Corequisite: Mus 396.
Mup 490S - Applied Music: Viola (1-4)
Senior year. Continuation of MuP 390. Maximum: 12 credits.
Prerequisite: MuP 390 and audition.
Corequisite: Mus 396.
Mup 490T - Applied Music: Trumpet (1-4)
Senior year. Continuation of MuP 390. Maximum: 12 credits.
Prerequisite: MuP 390 and audition.
Corequisite: Mus 395.
Mup 490U - Applied Music: Trombone (1-4)
Senior year. Continuation of MuP 390. Maximum: 12 credits.
Prerequisite: MuP 390 and audition.
Corequisite: Mus 395.
Mup 490V - Applied Music: Voice (1-4)
Senior year. Continuation of MuP 390. Maximum: 12 credits.
Prerequisite: MuP 390 and audition.
Corequisite: Mus 397.
Mup 490W - Applied Music: Tuba (1-4)
Senior year. Continuation of MuP 390. Maximum: 12 credits.
Prerequisite: MuP 390 and audition.
Corequisite: Mus 395.
Mup 490X - Applied Music: Euphonium (1-4)
Senior year. Continuation of MuP 390. Maximum: 12 credits.
Prerequisite: MuP 390 and audition.
Corequisite: Mus 395.
Mup 490Y - Applied Music: Viola (1-4)
Senior year. Continuation of MuP 390. Maximum: 12 credits.
Prerequisite: MuP 390 and audition.
Corequisite: Mus 395.
Mup 490Z - Applied Music: Saxophone (1-4)
Senior year. Continuation of MuP 390. Maximum: 12 credits.
Prerequisite: MuP 390 and audition.
Corequisite: Mus 395.
Mup 491 - Applied Music in Secondary Area: Trombone/Tuba (1-2)
Private instruction in voice, keyboard, guitar, and orchestral or band instruments, not to include the student's major performance area in order to extend the performance skills of the music specialist in the public schools. Graduate students not passing MuP 590 audition will be assigned MuP 591.
Mup 491B - Applied Music in Secondary Area: Baritone (1-2)
Private instruction in voice, keyboard, guitar, and orchestral or band instruments, not to include the student's major performance area in order to extend the performance skills of the music specialist in the public
schools. Graduate students not passing MuP 590 audition will be assigned MuP 591.

MuP 491C - Applied Music in Secondary Area: Cello/Bass (1-2)
Private instruction in voice, keyboard, guitar, and orchestral or band instruments, not to include the student's major performance area in order to extend the performance skills of the music specialist in the public schools. Graduate students not passing MuP 590 audition will be assigned MuP 591.

MuP 491D - Applied Music in Secondary Area: Percussion (1-2)
Private instruction in voice, keyboard, guitar, and orchestral or band instruments, not to include the student's major performance area in order to extend the performance skills of the music specialist in the public schools. Graduate students not passing MuP 590 audition will be assigned MuP 591.

MuP 491E - Applied Music in Secondary Area: French Horn (1-2)
Private instruction in voice, keyboard, guitar, and orchestral or band instruments, not to include the student's major performance area in order to extend the performance skills of the music specialist in the public schools. Graduate students not passing MuP 590 audition will be assigned MuP 591.

MuP 491F - Applied Music in Secondary Area: Guitar (1-2)
Private instruction in voice, keyboard, guitar, and orchestral or band instruments, not to include the student's major performance area in order to extend the performance skills of the music specialist in the public schools. Graduate students not passing MuP 590 audition will be assigned MuP 591.

MuP 491G - Applied Music in Secondary Area: Violin (1-2)
Private instruction in voice, keyboard, guitar, and orchestral or band instruments, not to include the student's major performance area in order to extend the performance skills of the music specialist in the public schools. Graduate students not passing MuP 590 audition will be assigned MuP 591.

MuP 491H - Applied Music in Secondary Area: Harpsichord/ Organ (1-2)
Private instruction in voice, keyboard, guitar, and orchestral or band instruments, not to include the student's major performance area in order to extend the performance skills of the music specialist in the public schools. Graduate students not passing MuP 590 audition will be assigned MuP 591.

MuP 491I - Applied Music in Secondary Area: Flute (1-2)
Private instruction in voice, keyboard, guitar, and orchestral or band instruments, not to include the student's major performance area in order to extend the performance skills of the music specialist in the public schools. Graduate students not passing MuP 590 audition will be assigned MuP 591.

MuP 491J - Applied Music in Secondary Area: Saxophone (1-2)
Private instruction in voice, keyboard, guitar, and orchestral or band instruments, not to include the student's major performance area in order to extend the performance skills of the music specialist in the public schools. Graduate students not passing MuP 590 audition will be assigned MuP 591.

MuP 491K - Applied Music in Secondary Area: Clarinet (1-2)
Private instruction in voice, keyboard, guitar, and orchestral or band instruments, not to include the student's major performance area in order to extend the performance skills of the music specialist in the public schools. Graduate students not passing MuP 590 audition will be assigned MuP 591.

MuP 491L - Applied Music in Secondary Area: Bassoon (1-2)
Private instruction in voice, keyboard, guitar, and orchestral or band instruments, not to include the student's major performance area in order to extend the performance skills of the music specialist in the public schools. Graduate students not passing MuP 590 audition will be assigned MuP 591.

MuP 491M - Applied Music in Secondary Area: Oboe (1-2)
Private instruction in voice, keyboard, guitar, and orchestral or band instruments, not to include the student's major performance area in order to extend the performance skills of the music specialist in the public schools. Graduate students not passing MuP 590 audition will be assigned MuP 591.

MuP 491N - Applied Music in Secondary Area: Piano (1-2)
Private instruction in voice, keyboard, guitar, and orchestral or band instruments, not to include the student's major performance area in order to extend the performance skills of the music specialist in the public schools. Graduate students not passing MuP 590 audition will be assigned MuP 591.

MuP 491O - Applied Music in Secondary Area: Viola (1-2)
Private instruction in voice, keyboard, guitar, and orchestral or band instruments, not to include the student's major performance area in order to extend the performance skills of the music specialist in the public schools. Graduate students not passing MuP 590 audition will be assigned MuP 591.

MuP 491P - Applied Music in Secondary Area: Trumpet (1-2)
Private instruction in voice, keyboard, guitar, and orchestral or band instruments, not to include the student's major performance area in order to extend the performance skills of the music specialist in the public schools. Graduate students not passing MuP 590 audition will be assigned MuP 591.

MuP 491Q - Applied Music in Secondary Area: Viola (1-2)
Private instruction in voice, keyboard, guitar, and orchestral or band instruments, not to include the student's major performance area in order to extend the performance skills of the music specialist in the public schools. Graduate students not passing MuP 590 audition will be assigned MuP 591.

MuP 491R - Applied Music in Secondary Area: Saxophone (1-2)
Private instruction in voice, keyboard, guitar, and orchestral or band instruments, not to include the student's major performance area in order to extend the performance skills of the music specialist in the public schools. Graduate students not passing MuP 590 audition will be assigned MuP 591.
schools. Graduate students not passing MuP 590 audition will be assigned MuP 591.

Mup 590 - Applied Music: Trombone (1-4)
Individual instruction in organ, piano, harpsichord, voice, guitar, and orchestral and band instruments. Maximum: 12 credits.
Prerequisite: audition.

Mup 590A - Applied Music: Trombone (1-4)
Individual instruction in organ, piano, harpsichord, voice, guitar, and orchestral and band instruments. Maximum: 12 credits.
Prerequisite: audition.

Mup 590B - Applied Music: Bass (1-4)
Individual instruction in organ, piano, harpsichord, voice, guitar, and orchestral and band instruments. Maximum: 12 credits.
Prerequisite: audition.

Mup 590C - Applied Music: Cello/Bass (1-4)
Individual instruction in organ, piano, harpsichord, voice, guitar, and orchestral and band instruments. Maximum: 12 credits.
Prerequisite: audition.

Mup 590D - Applied Music: Percussion (1-4)
Individual instruction in organ, piano, harpsichord, voice, guitar, and orchestral and band instruments. Maximum: 12 credits.
Prerequisite: audition.

Mup 590E - Applied Music: Early Instruments (1-4)
Individual instruction in organ, piano, harpsichord, voice, guitar, and orchestral and band instruments. Maximum: 12 credits.
Prerequisite: audition.

Mup 590F - Applied Music: French Horn (1-4)
Individual instruction in organ, piano, harpsichord, voice, guitar, and orchestral and band instruments. Maximum: 12 credits.
Prerequisite: audition.

Mup 590G - Applied Music: Guitar (1-4)
Individual instruction in organ, piano, harpsichord, voice, guitar, and orchestral and band instruments. Maximum: 12 credits.
Prerequisite: audition.

Mup 590H - Applied Music: Harpsichord/Organ (1 - 4)
Individual instruction in organ, piano, harpsichord, voice, guitar, and orchestral and band instruments. Maximum: 12 credits.
Prerequisite: Prerequisite: audition.

Mup 590I - Applied Music: Flute (1-4)
Individual instruction in organ, piano, harpsichord, voice, guitar, and orchestral and band instruments. Maximum: 12 credits.
Prerequisite: audition.

Mup 590J - Applied Music: Jazz Studies (1-4)
Individual instruction in organ, piano, harpsichord, voice, guitar, and orchestral and band instruments. Maximum: 12 credits.
Prerequisite: audition.

Mup 590K - Applied Music: Clarinet (1-4)
Individual instruction in organ, piano, harpsichord, voice, guitar, and orchestral and band instruments. Maximum: 12 credits.
Prerequisite: audition.

Mup 590L - Applied Music: Bassoon (1-4)
Individual instruction in organ, piano, harpsichord, voice, guitar, and orchestral and band instruments. Maximum: 12 credits.
Prerequisite: audition.

Mup 590M - Applied Music: Composition (1-4)
Individual instruction in organ, piano, harpsichord, voice, guitar, and orchestral and band instruments. Maximum: 12 credits.
Prerequisite: audition.

Mup 590N - Applied Music: Oboe (1-4)
Individual instruction in organ, piano, harpsichord, voice, guitar, and orchestral and band instruments. Maximum: 12 credits.
Prerequisite: audition.

Mup 590P - Applied Music: Piano (1-4)
Individual instruction in organ, piano, harpsichord, voice, guitar, and orchestral and band instruments. Maximum: 12 credits.
Prerequisite: audition.

Mup 590Q - Applied Music: Harp (1-4)
Individual instruction in organ, piano, harpsichord, voice, guitar, and orchestral and band instruments. Maximum: 12 credits.
Prerequisite: audition.

Mup 590S - Applied Music: Violin (1-4)
Individual instruction in organ, piano, harpsichord, voice, guitar, and orchestral and band instruments. Maximum: 12 credits.
Prerequisite: audition.

Mup 590T - Applied Music: Trumpet (1-4)
Individual instruction in organ, piano, harpsichord, voice, guitar, and orchestral and band instruments. Maximum: 12 credits.
Prerequisite: audition.

Mup 590U - Applied Music: Trombone (1-4)
Individual instruction in organ, piano, harpsichord, voice, guitar, and orchestral and band instruments. Maximum: 12 credits.
Prerequisite: audition.

Mup 590V - Applied Music: Voice (1-4)
Individual instruction in organ, piano, harpsichord, voice, guitar, and orchestral and band instruments. Maximum: 12 credits.
Prerequisite: audition.

Mup 590W - Applied Music: Tuba (1-4)
Individual instruction in organ, piano, harpsichord, voice, guitar, and orchestral and band instruments. Maximum: 12 credits.
Prerequisite: audition.

Mup 590X - Applied Music: Euphonium (1-4)
Individual instruction in organ, piano, harpsichord, voice, guitar, and orchestral and band instruments. Maximum: 12 credits.
Prerequisite: audition.

Mup 590Y - Applied Music: Viola (1-4)
Individual instruction in organ, piano, harpsichord, voice, guitar, and orchestral and band instruments. Maximum: 12 credits.
Prerequisite: audition.

Mup 590Z - Applied Music: Saxophone (1-4)
Individual instruction in organ, piano, harpsichord, voice, guitar, and orchestral and band instruments. Maximum: 12 credits.
Prerequisite: audition.

Mup 591 - Applied Music in Secondary Area: Trombone/Tuba (1-2)

Private instruction in voice, keyboard, guitar, and orchestral or band instruments, not to include the student's major performance area in order to extend the performance skills of the music specialist in the public schools. Graduate students not passing MuP 590 audition will be assigned MuP 591.

Mup 591A - Applied Music in Secondary Area: Trombone (1-2)

Private instruction in voice, keyboard, guitar, and orchestral or band instruments, not to include the student's major performance area in order to extend the performance skills of the music specialist in the public schools. Graduate students not passing MuP 590 audition will be assigned MuP 591.

Mup 591B - Applied Music in Secondary Area: Baritone (1-2)

Private instruction in voice, keyboard, guitar, and orchestral or band instruments, not to include the student's major performance area in order to extend the performance skills of the music specialist in the public schools. Graduate students not passing MuP 590 audition will be assigned MuP 591.

Mup 591C - Applied Music in Secondary Area: Cello/Bass (1-2)

Private instruction in voice, keyboard, guitar, and orchestral or band instruments, not to include the student's major performance area in order to extend the performance skills of the music specialist in the public schools. Graduate students not passing MuP 590 audition will be assigned MuP 591.

Mup 591D - Applied Music in Secondary Area: Percussion (1-2)

Private instruction in voice, keyboard, guitar, and orchestral or band instruments, not to include the student's major performance area in order to extend the performance skills of the music specialist in the public schools. Graduate students not passing MuP 590 audition will be assigned MuP 591.

Mup 591F - Applied Music in Secondary Area: French Horn (1-2)

Private instruction in voice, keyboard, guitar, and orchestral or band instruments, not to include the student's major performance area in order to extend the performance skills of the music specialist in the public schools. Graduate students not passing MuP 590 audition will be assigned MuP 591.

Mup 591G - Applied Music in Secondary Area: Guitar (1-2)

Private instruction in voice, keyboard, guitar, and orchestral or band instruments, not to include the student's major performance area in order to extend the performance skills of the music specialist in the public schools. Graduate students not passing MuP 590 audition will be assigned MuP 591.

Mup 591H - Applied Music in Secondary Area: Harpsichord/Organ (1-2)

Private instruction in voice, keyboard, guitar, and orchestral or band instruments, not to include the student's major performance area in order to extend the performance skills of the music specialist in the public schools. Graduate students not passing MuP 590 audition will be assigned MuP 591.

Mup 591I - Applied Music in Secondary Area: Jazz Studies (1-2)

Private instruction in voice, keyboard, guitar, and orchestral or band instruments, not to include the student's major performance area in order to extend the performance skills of the music specialist in the public schools. Graduate students not passing MuP 590 audition will be assigned MuP 591.

Mup 591J - Applied Music in Secondary Area: Clarinet (1-2)

Private instruction in voice, keyboard, guitar, and orchestral or band instruments, not to include the student's major performance area in order to extend the performance skills of the music specialist in the public schools. Graduate students not passing MuP 590 audition will be assigned MuP 591.

Mup 591K - Applied Music in Secondary Area: Bassoon (1-2)

Private instruction in voice, keyboard, guitar, and orchestral or band instruments, not to include the student's major performance area in order to extend the performance skills of the music specialist in the public schools. Graduate students not passing MuP 590 audition will be assigned MuP 591.

Mup 591L - Applied Music in Secondary Area: Oboe (1-2)

Private instruction in voice, keyboard, guitar, and orchestral or band instruments, not to include the student's major performance area in order to extend the performance skills of the music specialist in the public schools. Graduate students not passing MuP 590 audition will be assigned MuP 591.

Mup 591M - Applied Music in Secondary Area: Piano (1-2)

Private instruction in voice, keyboard, guitar, and orchestral or band instruments, not to include the student's major performance area in order to extend the performance skills of the music specialist in the public schools. Graduate students not passing MuP 590 audition will be assigned MuP 591.

Mup 591N - Applied Music in Secondary Area: Trumpet (1-2)

Private instruction in voice, keyboard, guitar, and orchestral or band instruments, not to include the student's major performance area in order to extend the performance skills of the music specialist in the public schools. Graduate students not passing MuP 590 audition will be assigned MuP 591.
Mus 591V - Applied Music in Secondary Area: Voice (1-2)

Private instruction in voice, keyboard, guitar, and orchestral or band instruments, not to include the student's major performance area in order to extend the performance skills of the music specialist in the public schools. Graduate students not passing MuP 590 audition will be assigned MuP 591.

Mus 591Y - Applied Music in Secondary Area: Viola (1-2)

Private instruction in voice, keyboard, guitar, and orchestral or band instruments, not to include the student’s major performance area in order to extend the performance skills of the music specialist in the public schools. Graduate students not passing MuP 590 audition will be assigned MuP 591.

Mus 591Z - Applied Music in Secondary Area: Saxophone (1-2)

Private instruction in voice, keyboard, guitar, and orchestral or band instruments, not to include the student’s major performance area in order to extend the performance skills of the music specialist in the public schools. Graduate students not passing MuP 590 audition will be assigned MuP 591.

Mus - Music

Mus 047 - Final Project (0)

All Bachelor of Arts and Bachelor of Science degree candidates must complete a final project consisting of one of the following: (1) a half recital, (2) a performance project, (3) regular performances on area recitals.

Mus 101 - Basic Materials of Music (4)

Basic course in the theory, structure, and literature of music, requiring no previous musical experience. Includes basic sight-singing, music reading, writing, score analysis and composition in a variety of musical styles. For non-majors and preparation for students for enrollment in Music Theory I. This is the second course in a sequence of three: Mus 101, Mus 102, and Mus 103.

Mus 103 - Basic Materials of Music (4)

Basic course in the theory, structure, and literature of music, requiring no previous musical experience. Includes basic sight-singing, music reading, writing, score analysis and composition in a variety of musical styles. For non-majors and preparation for students for enrollment in Music Theory I. This is the third course in a sequence of three: Mus 101, Mus 102, and Mus 103.

Mus 105 - Introduction to Music Theory (3)

Preparatory level of music theory introducing basic concepts: music notation, meter, beat, rhythm, intervals, circle of fifth, key signatures, major and minor scales, triads and dominant seventh chord, and their implementation in blues form and popular song. No previous musical knowledge required. Complements Practical Musicianship.

Mus 106 - Aural Skills (3)

Designed to train the student to aurally recognize meters, rhythms, intervals, triads and seventh chords. Students learn to sing melodies on sight as well as develop strategies for composing and harmonizing melodies for instrumental or vocal accompaniment.

Mus 111 - Music Theory I (3)

Provides a thorough ground-work in the melodic, harmonic, and rhythmic elements of music with written exercises and analysis based on the styles of Bach, Haydn, Mozart, Beethoven, and other 17th and 18th century composers. Registration in the appropriate Sight-Singing/Ear Training course is required. An entrance placement examination will be given. Basic Keyboard Skills is recommended for music majors and minors. This is the first course in a sequence of three: Mus 111, Mus 112, and Mus 113.

Mus 113 - Music Theory I (3)

Provides a thorough ground-work in the melodic, harmonic, and rhythmic elements of music with written exercises and analysis based on the styles of Bach, Haydn, Mozart, Beethoven, and other 17th and 18th century composers. Registration in the appropriate Sight-Singing/Ear Training course is required. An entrance placement examination will be given. Basic Keyboard Skills is recommended for music majors and minors. This is the third course in a sequence of three: Mus 111, Mus 112, and Mus 113.

Mus 114 - Sight-Singing/Ear Training (1)

Studies to develop the ability to sing notation at sight and to recognize and notate aural patterns. Registration in the appropriate Music Theory I course is required. This is the first course in a sequence of three: Mus 114, Mus 115, Mus 116.

Mus 115 - Sight-Singing/Ear Training (1)

Studies to develop the ability to sing notation at sight and to recognize and notate aural patterns. Registration in the appropriate Music Theory I course is required. This is the second course in a sequence of three: Mus 114, Mus 115, Mus 116.

Mus 116 - Sight-Singing/Ear Training (1)

Studies to develop the ability to sing notation at sight and to recognize and notate aural patterns. Registration in the appropriate Music Theory I course is required. This is the third course in a sequence of three: Mus 114, Mus 115, Mus 116.

Mus 125 - Guitar Workshop (2)

A workshop for discussion and applications of guitar related topics. Topics to include technique, sight-reading, transcribing. Audition may be required. This is the first course in a sequence of three: Mus 125, Mus 126, and Mus 127.
Mus 126 - Guitar Workshop (2)
A workshop for discussion and applications of guitar related topics. Topics to include technique, sight-reading, transcribing. Audition may be required. This is the second course in a sequence of three: Mus 125, Mus 126, and Mus 127.

Mus 127 - Guitar Workshop (2)
A workshop for discussion and applications of guitar related topics. Topics to include technique, sight-reading, transcribing. Audition may be required. This is the third course in a sequence of three: Mus 125, Mus 126, and Mus 127.

Mus 128 - Recording Live Sound (4)
Provides students with the skills necessary to set-up and operate professional sound reinforcement equipment. Guides students through the ins and outs of sound system components, setups, mixing and troubleshooting, as well as principles and concepts fundamental to live sound reinforcement. Provides video tutorials with hands-on demonstrations providing tips and techniques used in real live sound situations from indoor venues to outdoor stages.

Mus 129 - Desktop Music Production (4)
Provides students with the necessary skills and techniques to produce CD quality music using modern music technology. Students will learn to record and edit audio from a variety of sources, processing and effects, MIDI and Podcasting.

Mus 174 - Introduction to Music Technology (3)
A hands-on introduction to the basic concepts, equipment, and software involved in modern music production. Covers introduction to MIDI sequencing, analog and digital audio, and basic studio techniques.

Mus 185 - Guitar Orchestra (1)
A large guitar ensemble. Audition required.

Mus 187 - Yoga, Relaxation and Flexibility for Musicians (1)
A course for musicians that incorporates gentle stretching, mild postures, breathing and relaxation techniques. Class participants will be guided through activities drawn from the disciplines of yoga, Tai Chi, and general flexibility and relaxation exercises. There are no prerequisites for this class. Equipment required: yoga mat and strap. Optional equipment: yoga block.

Mus 188 - Performance Attendance (0)
The student is expected to attend a minimum of eight live performances approved by the School of Music for each term registered. It is expected that students will register for Performance Attendance concurrently with registration for Applied Music.

Mus 189 - Repertoire Study (1)
Study and performance of selected repertoire. Available only to students enrolled in large ensemble, chamber music or applied music.
Prerequisite: consent of instructor.

Mus 191 - Class Instruction (2)
Class instruction in instruments or voice. Offerings include piano, guitar, and voice. Music majors in Mus 193 Class Piano should be enrolled in Mus 046 concurrently. This is the first course in a sequence of three: Mus 191, Mus 192, and Mus 193.

Mus 192 - Class Instruction (2)
Class instruction in instruments or voice. Offerings include piano, guitar, and voice. Music majors in Mus 193 Class Piano should be enrolled in Mus 046 concurrently. This is the second course in a sequence of three: Mus 191, Mus 192, and Mus 193.

Mus 193 - Class Instruction (2)
Class instruction in instruments or voice. Offerings include piano, guitar, and voice. Music majors in Mus 193 Class Piano should be enrolled in Mus 046 concurrently. This is the third course in a sequence of three: Mus 191, Mus 192, and Mus 193.

Mus 194 - Chamber Music (1)
Instruction in the art of small ensemble performance; the established repertory of string, wind, keyboard, or vocal chamber music. Maximum: 6 credits. Audition may be requested.
Prerequisite: consent of instructor.

Mus 195 - Band (1)
Maximum: 6 credits. Audition may be requested.

Mus 196 - Orchestra (1)
Maximum: 6 credits. Audition may be requested.

Mus 197 - Chorus (1)
Maximum: 6 credits. Audition may be requested.

Mus 198 - Jazz Lab Band (1)
Performance of jazz literature in a big band setting. Maximum: 6 credits. Audition may be requested.

Mus 199 - Special Studies (1-4)
(Credit to be arranged.)

Mus 200 - Musical Instruments (4)
Study of the conventional classification, history, construction, and the use of instruments in classical, folk, and popular music. Instruments are explored in terms of: manner of producing sound, tuning and transposing, technical capabilities, virtuosity, and compatibility with other instruments/vocal parts as demonstrated in the literature. Develops aural recognition of each instrument.

Mus 201 - Introduction to Music (4)
Designed for non-majors. Course involves lectures, reading, and listening. Course may emphasize music of different world cultures. Successively the course deals with elements of music and small forms (201), and large forms of music and categories of musical literature (202). This is the first course in a sequence of two: Mus 201 and Mus 202.

Mus 202 - Introduction to Music (4)
Designed for non-majors. Course involves lectures, reading, and listening. Course may emphasize music of different world cultures. Successively the course deals with elements of music and small forms (201), and large forms of music and categories of musical literature (202). This is the second course in a sequence of two: Mus 201 and Mus 202.

Mus 203 - Music in the Western World (4)
Designed for music majors and others with the ability to read music. Introduction to the great composers and their compositions within a historical framework.

Mus 204 - Body Mapping for Musicians (2)
Anatomical information about the body in movement for musicians. Topics include
sensory awareness, inclusive awareness, standing and sitting at balance, skeletal anatomy of the arms and legs, the structures and movements of breathing, hearing loss prevention, and performance anxiety.

Prerequisite: At least one year of experience as a singer or instrumentalist.

Mus 205 - Listening I (1)

Online listening survey of the major works within various musical traditions, including Western art music, Jazz, American music, and World music. This is the first course in a sequence of two: Mus 205 and Mus 206.

Mus 206 - Listening II (1)

Online listening survey of the major works within various musical traditions, including Western art music, Jazz, American music, and World music. This is the second course in a sequence of two: Mus 205 and Mus 206.

Mus 211 - Music Theory II (3)

Continuation of the study of harmony. Introduction to harmonic counterpoint. Composition in small forms in various 18th, 19th, and 20th century idioms. Registration in the appropriate Sight-Singing/Ear Training course is required. This is the first course in a sequence of three: Mus 211, Mus 212, and Mus 213.

Prerequisite: Mus 046, Mus 113, and Mus 116.

Mus 212 - Music Theory II (3)

Continuation of the study of harmony. Introduction to harmonic counterpoint. Composition in small forms in various 18th, 19th, and 20th century idioms. Registration in the appropriate Sight-Singing/Ear Training course is required. This is the second course in a sequence of three: Mus 211, Mus 212, and Mus 213.

Prerequisite: Mus 046, Mus 113, and Mus 116.

Mus 213 - Music Theory II (3)

Continuation of the study of harmony. Introduction to harmonic counterpoint. Composition in small forms in various 18th, 19th, and 20th century idioms. Registration in the appropriate Sight-Singing/Ear Training course is required. This is the third course in a sequence of three: Mus 211, Mus 212, and Mus 213.

Prerequisite: Mus 046, Mus 113, and Mus 116.

Mus 214 - Sight Singing and Ear Training (1)

Continuation of the study of sight-singing and ear training at an advanced level. Ability to sing notation at sight and to recognize and notate aural patterns. Registration in the appropriate Music Theory II course is required. This is the first course in a sequence of three: Mus 214, Mus 215, and Mus 216.

Prerequisite: Mus 113 and Mus 116.

Mus 215 - Sight Singing and Ear Training (1)

Continuation of the study of sight-singing and ear training at an advanced level. Ability to sing notation at sight and to recognize and notate aural patterns. Registration in the appropriate Music Theory II course is required. This is the second course in a sequence of three: Mus 214, Mus 215, and Mus 216.

Prerequisite: Mus 113 and Mus 116.

Mus 216 - Sight Singing and Ear Training (1)

Continuation of the study of sight-singing and ear training at an advanced level. Ability to sing notation at sight and to recognize and notate aural patterns. Registration in the appropriate Music Theory II course is required. This is the third course in a sequence of three: Mus 214, Mus 215, and Mus 216.

Prerequisite: Mus 113 and Mus 116.

Mus 228 - Sound Design (4)

Up-to-date introduction to the art of sound synthesis and sampling with special emphasis on today’s technology and the evolving market place. Comprehensive overview of specific techniques for creating new sounds, capturing and manipulating existing sounds and application.

Mus 229 - Recording Theory (4)

Up-to-date introduction to the art of audio recording with special emphasis on today's technology and the evolving marketplace. Comprehensive overview of microphones, specific techniques for recording drums, individual instruments and vocals. Considerations for Home studio development are discussed including DAW selection and acoustic conditioning.
Prerequisite: Mus 113 and Mus 116.

**Mus 242 - Composition I (2)**
The course involves the study of 20th century composition techniques. Students will compose chamber works using techniques studied in the class. This is the third course in a sequence of three: Mus 240, Mus 241, and Mus 242 which must be taken in sequence.

Prerequisite: Mus 113 and Mus 116.

**Mus 261 - History of Rock Music (4)**
Traces the history and development of a popular music style in the United States, Great Britain, and other parts of the world. Includes other types of popular music in the twentieth century. This is the first course in a sequence of two: Mus 261 and Mus 262.

**Mus 262 - History of Rock Music (4)**
Traces the history and development of a popular music style in the United States, Great Britain, and other parts of the world. Includes other types of popular music in the twentieth century. This is the second course in a sequence of two: Mus 261 and Mus 262.

**Mus 273 - Jazz Improvisation (2)**
Introduces the fundamentals of jazz improvisation. Beginning jazz skills include scales, song forms, melodic patterns, and repertoire development. Instructor approval required. This is the first course in a sequence of three: Mus 271, Mus 272, and Mus 273.

**Mus 272 - Jazz Improvisation (2)**
Introduces the fundamentals of jazz improvisation. Beginning jazz skills include scales, song forms, melodic patterns, and repertoire development. Instructor approval required. This is the second course in a sequence of three: Mus 271, Mus 272, and Mus 273.

**Mus 274 - Introduction to World Music (4)**
Provides an insight into the abundance of trends called World Music. Explains what is considered world music and what is not. With a very broad approach, material samples every corner of the world through representative traditions, performing styles and instruments of different nations.

**Mus 291 - Advanced Class Piano (2)**
Advanced class instruction developing functional piano skills. Activities include performing scales, chords, and progressions in all keys. Students develop harmonization, sight reading, and improvisation skills. They perform simple piano pieces and accompaniments. Assessment by the instructor determines whether students are admitted, or should take basic Class Piano first. This is the first course in a sequence of three: Mus 291, Mus 292, and Mus 293.

**Mus 292 - Advanced Class Piano (2)**
Advanced class instruction developing functional piano skills. Activities include performing scales, chords, and progressions in all keys. Students develop harmonization, sight reading, and improvisation skills. They perform simple piano pieces and accompaniments. Assessment by the instructor determines whether students are admitted, or should take basic Class Piano first. This is the second course in a sequence of three: Mus 291, Mus 292, and Mus 293.

**Mus 293 - Advanced Class Piano (2)**
Advanced class instruction developing functional piano skills. Activities include performing scales, chords, and progressions in all keys. Students develop harmonization, sight reading, and improvisation skills. They perform simple piano pieces and accompaniments. Assessment by the instructor determines whether students are admitted, or should take basic Class Piano first. This is the third course in a sequence of three: Mus 291, Mus 292, and Mus 293.

**Mus 301 - Survey of Music Literature I (4)**
For non-majors; study of the history of music through examination of the literature of particular periods as follows: Mus 301: Music from 1700 to 1875; Mus 302: Music from 1875 to present. This is the first course in a sequence of two: Mus 301 and Mus 302.

**Mus 302 - Survey of Music Literature II (4)**
For non-majors; study of the history of music through examination of the literature of particular periods as follows: Mus 301: Music from 1700 to 1875; Mus 302: Music from 1875 to present. This is the second course in a sequence of two: Mus 301 and Mus 302.

**Mus 304U - Survey of Music Literature III (4)**
For non-majors; study of the history of music through examination of the literature of particular periods as follows: Mus 301: Music from 1700 to 1875; Mus 302: Music from 1875 to present. This is the second course in a sequence of two: Mus 301 and Mus 302.

**Mus 304 - Music History (4)**
Intensive analytical study of the history of music in the Medieval and Renaissance Periods (Mus 304), Baroque and Classical Periods (Mus 305) and Romantic and 20th century periods (Mus 306). This is the first course in a sequence of three: Mus 304, Mus 305, and Mus 306.

**Mus 305 - Music History (4)**
Intensive analytical study of the history of music in the Medieval and Renaissance Periods (Mus 304), Baroque and Classical Periods (Mus 305) and Romantic and 20th century periods (Mus 306). This is the second course in a sequence of three: Mus 304, Mus 305, and Mus 306.

**Mus 306 - Music History (4)**
Intensive analytical study of the history of music in the Medieval and Renaissance Periods (Mus 304), Baroque and Classical Periods (Mus 305) and Romantic and 20th century periods (Mus 306). This is the third course in a sequence of three: Mus 304, Mus 305, and Mus 306.
Mus 311 - Formal Analysis (3)
Thorough study of formal analysis, including phrases and periods, variations, two- and three-part song forms, developed ternary forms, sonata, rondo, and the concerto.
Prerequisite: Mus 213.

Mus 312 - Orchestration (3)
Fundamentals of arranging music for instrumental ensembles. Emphasis on basic principles of orchestration and their practical applications.
Prerequisite: Mus 213. Countertop (3)

Mus 313 - Counterpoint (3)
Intensive study of polyphonic music. Analysis and application in writing contrapuntal exercises using two, three, and four voices.
Prerequisite: Mus 213.

Mus 314 - Harmonic and Structural Analysis (2)
Thorough study of formal analysis, including the phrase unit, period, two- and three-part song forms, developed ternary forms, sonata, symphony, concerto, etc.
Prerequisite: Mus 211, 212, 213.

Mus 319 - Choral Arranging (2)
Fundamentals of arranging music for vocal ensembles. Emphasis on basic principles of SATB writing.
Prerequisite: Mus 213.

Mus 320 - Fundamentals of Conducting (2)
The basic principles of conducting as they apply to both instrumental and vocal ensembles. Basic baton technique and beat patterns. Development of an independent use of the hands. Fundamentals of score reading, both instrumental and vocal.
Prerequisite: Mus 213.

Mus 321 - Instrumental Conducting (2)
The principles of conducting and training instrumental organizations.
Prerequisite: Mus 320.

Mus 322 - Choral Conducting (2)
The principles of conducting and training choral organizations.
Prerequisite: Mus 320.

Mus 325 - Guitar Workshop (2)
A workshop for discussion and applications of guitar related topics. Topics to include technique, sight-reading, transcribing. Audition may be required.

Mus 326 - Guitar Workshop (2)
A workshop for discussion and applications of guitar related topics. Topics to include technique, sight-reading, transcribing. Audition may be required.

Mus 327 - Guitar Workshop (2)
A workshop for discussion and applications of guitar related topics. Topics to include technique, sight-reading, transcribing. Audition may be required.

Mus 332 - String Instruments and Vocal Techniques (1)
A study of stringed instruments (Mus 332, 333) and vocal and guitar techniques (Mus 334). For students in the teacher education program.

Mus 334 - Vocal and Guitar Techniques (1)
A study of stringed instruments (Mus 332, 333) and vocal and guitar techniques (Mus 334). For students in the teacher education program.

Mus 351 - Accompanying (2)
Theoretical and practical study of the art of accompanying vocal and instrumental solos and performing duo-sonatas.

Mus 355 - Jazz History (4)
Examines the development of jazz from its African and European roots and its origins in New Orleans to its florescence in Chicago and New York. Covers period from about 1900 to 1960. Focuses on important musicians and major musical styles.

Mus 355U - Jazz History (4)
Examines jazz and its development in the context of American history. Jazz, pre-jazz, contemporary practice, and related subgenres will be explored through listening and analysis. The cultural context from which the music emerged will be dissected and discussed. Covers period from the mid-1800s to today.

Mus 356U - Jazz And American Culture: How History Shaped Our Music, Then and Now (4)
Examines jazz and its development in the context of American history. Jazz, pre-jazz, contemporary practice, and related subgenres will be explored through listening and analysis. The cultural context from which the music emerged will be dissected and discussed. Covers period from the mid-1800s to today.

Mus 360 - The Guitar: its History and Music (4)
This course is designed to explore the origins of the guitar by examining its history, repertoire and performers. The course will look at all aspects of the guitar’s history from the related ancient Sumerian stringed instruments to the modern-day electric guitar.

Mus 360U - The Guitar: its History and Music (4)
This course is designed to explore the origins of the guitar by examining its history, repertoire and performers. The course will look at all aspects of the guitar’s history from the related ancient Sumerian stringed instruments to the modern-day electric guitar.

Mus 361 - History of Rock Music (4)
Traces the history and development of a popular music style in the United States, Great Britain, and other parts of the world. Includes other types of popular music in the twentieth century. This is the first course in a sequence of two: Mus 361 and Mus 362.

Mus 361U - History of Rock Music (4)
Traces the history and development of a popular music style in the United States, Great Britain, and other parts of the world. Includes other types of popular music in the
Mus 362 - History of Rock Music (4)
Traces the history and development of a popular music style in the United States, Great Britain, and other parts of the world. Includes other types of popular music in the twentieth century. This is the second course in a sequence of two: Mus 361 and Mus 362.

Mus 362U - History of Rock Music (4)
Traces the history and development of a popular music style in the United States, Great Britain, and other parts of the world. Includes other types of popular music in the twentieth century. This is the second course in a sequence of two: Mus 361 and Mus 362.

Mus 363 - The Music of the Beatles (4)
Study of the development of the Beatles' music from the late 1950’s through the early 1970’s. Students will gain a deeper understanding of the music through elementary musical analysis of form, harmony, and recording studio techniques. The cultural context from which their music emerged and their significant influence on popular culture will be examined.

Mus 363U - The Music of the Beatles (4)
Study of the development of the Beatles’ music from the late 1950’s through the early 1970’s. Students will gain a deeper understanding of the music through elementary musical analysis of form, harmony, and recording studio techniques. The cultural context from which their music emerged and their significant influence on popular culture will be examined.

Mus 364 - Modern Music Technology (4)
An in-depth examination of digital technologies used for creating and distributing music, and the social impact of these technologies.

Mus 364U - Modern Music Technology (4)
An in-depth examination of digital technologies used for creating and distributing music, and the social impact of these technologies.

Mus 365 - Film Music (4)
An aesthetic, historical, commercial, and technical examination of the role of music and sound design within the art of film.

Mus 374 - World Music (4)
Study of the major musical cultures of Asia, the Middle East, and sub-Saharan Africa. Explores social and cultural contexts, instrument types, and structural organization of the music. Emphasis on listening. This is the first course in a sequence of two: Mus 374 and Mus 375.

Mus 374U - World Music (4)
Study of the major musical cultures of Asia, the Middle East, and sub-Saharan Africa. Explores social and cultural contexts, instrument types, and structural organization of the music. Emphasis on listening. This is the first course in a sequence of two: Mus 374 and Mus 375.

Mus 375 - World Music (4)
Study of the major musical cultures of Asia, the Middle East, and sub-Saharan Africa. Explores social and cultural contexts, instrument types, and structural organization of the music. Emphasis on listening. This is the second course in a sequence of two: Mus 374 and Mus 375.

Mus 375U - World Music (4)
Study of the major musical cultures of Asia, the Middle East, and sub-Saharan Africa. Explores social and cultural contexts, instrument types, and structural organization of the music. Emphasis on listening. This is the second course in a sequence of two: Mus 374 and Mus 375.

Mus 376 - American Musical Traditions (4)
Examines the diversity of musical traditions found in American history and culture. Included are African American, Anglo-American, Hispanic, and Native-American musical cultures, in the areas of folk, popular, and classical music genres.

Mus 376U - American Musical Traditions (4)
Examines the diversity of musical traditions found in American history and culture. Included are African American, Anglo-American, Hispanic, and Native-American musical cultures, in the areas of folk, popular, and classical music genres.

Mus 377 - World Music: Latin America and the Caribbean (4)
The course presents Latin American musical genres and forms: bolero, bossa nova, choro, rumba, salsa, samba, tango, Latin pop.

Against the backdrop of each country’s historical circumstances, music and social dancing are used as an entry point to understanding political events, cultural trends, and a makeup of Latino cultural identities.

Mus 381 - Music Fundamentals (4)
Basic musicianship for the elementary teacher. Instruction includes integration projects in Music for the elementary classroom.

Mus 385 - Guitar Orchestra (1)
A large guitar ensemble. Audition required.

Mus 389 - Repertoire Study (1)
Study and performance of selected repertoire. Available only to students enrolled in large ensemble, chamber music or applied music.

Prerequisite: consent of instructor.

Mus 394 - Chamber Music (1)
Instruction in the art of small ensemble performance; the established repertory of string, wind, keyboard, or vocal chamber music. Maximum: 6 credits.

Prerequisite: consent of instructor.

Mus 395 - Band (1)
Maximum: 6 credits. Audition may be requested.

Mus 396 - Orchestra (1)
Maximum: 6 credits. Audition may be requested.

Mus 397 - Chorus (1)
Maximum: 6 credits. Audition may be requested.

Mus 398 - Jazz Lab Band (1)
Performance of jazz literature in a big band setting. Maximum: 6 credits. Audition may be requested.

Mus 399 - Special Studies (1-6)
(Credit to be arranged.)

Mus 47 - Final Project (0)
See department for course description.

Mus 401 - Research (1-6)
(Credit to be arranged.) Consent of instructor.
Mus 404 - Cooperative Education/Internship (1-12)
(Credit to be arranged.)
Mus 405 - Reading and Conference (1-6)
(Credit to be arranged.) Consent of instructor.
Mus 406 - Special Projects (1-12)
(Credit to be arranged.) Consent of instructor.
Mus 407 - Seminar (1-6)
(Credit to be arranged.) Consent of instructor. Recent topics have included Style Analysis; Style Criticism; Music History; Music in the Elementary School; Seminar in Composition.
Mus 407U - Seminar (4)
(Credit to be arranged.) Consent of instructor. Recent topics have included Style Analysis; Style Criticism; Music History; Music in the Elementary School; Seminar in Composition.
Mus 408 - Workshop (0-6)
(Credit to be arranged.)
Mus 409 - Practicum (1-12)
(Credit to be arranged.)
Mus 410 - Selected Topics (1-6)
(Credit to be arranged.)
Mus 410U - Selected Topics (4)
(Credit to be arranged.)
Mus 411 - Topics in Music History (2)
Examines a selected theme in music history to be drawn from specific composers, performers, genres, styles, works, geographical locations, or time periods. Topics will be contextualized to address broader issues of race, ethnicity, gender, cultural significance, ownership, transmission, technology, and globalization. Specific topics vary by term. Course may be taken more than once with permission of instructor.
Prerequisite: Mus 306.
Mus 421 - Analysis of Contemporary Music (3)
Thorough study of the compositional techniques and structural devices used in contemporary music. Topics include formal, harmonic, and rhythmic aspects of modern music. Serialism, set theory, texture, and indeterminacy are also addressed.
Prerequisite: Mus 211, 212, 213.
Mus 422 - Analytical Techniques (3)
Study of the formal structure of musical compositions of various styles with the purpose of discovering the sources of unity, variety, order, and expression present in them.
Prerequisite: Mus 311.
Mus 424 - Instrumental Jazz Arranging (2)
In-depth study and application of the fundamentals of composing and arranging for small to large jazz ensembles. Subjects included are history, transposition, instruments, forms, harmonic and melodic construction, rhythm section, voicing, moving harmonization, score and part preparation, vocal arranging techniques, rehearsal techniques, and MIDI applications. Instructor approval required. Also offered for graduate-level credit as Mus 524 and may be taken only once for credit. This is the first course in a sequence of three: Mus 424, Mus 425, and Mus 426.
Mus 425 - Instrumental Jazz Arranging (2)
In-depth study and application of the fundamentals of composing and arranging for small to large jazz ensembles. Subjects included are history, transposition, instruments, forms, harmonic and melodic construction, rhythm section, voicing, moving harmonization, score and part preparation, vocal arranging techniques, rehearsal techniques, and MIDI applications. Instructor approval required. Also offered for graduate-level credit as Mus 524 and may be taken only once for credit. This is the second course in a sequence of three: Mus 424, Mus 425, and Mus 426.
Mus 426 - Instrumental Jazz Arranging (2)
In-depth study and application of the fundamentals of composing and arranging for small to large jazz ensembles. Subjects included are history, transposition, instruments, forms, harmonic and melodic construction, rhythm section, voicing, moving harmonization, score and part preparation, vocal arranging techniques, rehearsal techniques, and MIDI applications. Instructor approval required. Also offered for graduate-level credit as Mus 524 and may be taken only once for credit. This is the third course in a sequence of three: Mus 424, Mus 425, and Mus 426.
Mus 427 - Opera Workshop (1)
A workshop in preparing and performing operatic literature for advanced singers. Also offered for graduate-level credit as Mus 527 and may be taken only once for credit.
Prerequisite: consent of instructor through audition.
Mus 428 - Opera Production (2)
Annual production of a major operatic work. Designed for singers, orchestral instrumentalists, and technical support staff in the areas of costuming, set design, and other areas. Casting for production is by audition during winter quarter. Also offered for graduate-level credit as Mus 523 and may be taken only once for credit.
Mus 430 - Song Literature (3)
Study of the solo literature for voice through analysis of scores and recordings and live performances. Historical perspectives from Elizabethan song to 20th-century art songs. Also offered for graduate-level credit as Mus 530 and may be taken only once for credit.
Prerequisite: Mus 304, Mus 305, Mus 306.
Mus 431 - Chamber Music Literature (3)
Historical survey of the music associated with the chamber music repertoire from 1600-1950. Emphasis on analysis of scores and recordings. Also offered for graduate-level credit as Mus 531 and may be taken only once for credit.
Prerequisite: Mus 304, Mus 305, Mus 306.
Mus 432 - Band Wind Literature (3)
A study of literature for ensembles of wind and wind/percussion instruments from about 1600 to the present. Historical perspective will be gained through reading, style-analysis, and listening. Attention will be given to the practical application of band literature in elementary and secondary teaching situations. Also offered for graduate-level credit as Mus 532 and may be taken only once for credit.
Prerequisite: Mus 304, Mus 305, Mus 306.
Mus 433 - Orchestral Literature (3)
A historical survey of the music associated with the symphony orchestra from the
Mus 434 - Choral Literature (3)
This course offers an investigation and analysis of literature for choir of all sizes, for secular and sacred use, particularly in relation to use in public school at the junior high and high school levels and in church choir situations. A survey of the development of choral literature from c. 1400 to the present, with examples via listening and study of scores, will be included. Also offered for graduate-level credit as Mus 534 and may be taken only once for credit.
Prerequisite: Mus 304, Mus 305, Mus 306.

Mus 436 - Opera Literature (3)
An intensive study of the development of opera in western music, from the works of Monteverdi in the early 17th century to the important operas of this century. Also offered for graduate-level credit as Mus 536 and may be taken only once for credit.
Prerequisite: Mus 304, Mus 305, Mus 306.

Mus 437 - Keyboard Literature (3)
A study of Baroque, Classical, Romantic, and Twentieth Century literature for keyboard instruments. In addition to providing an overview of the historical development of keyboard music, specific works from the repertoire of each period will be selected for intensive study and performance. Intended primarily for piano or harpsichord majors. Also offered for graduate-level credit as Mus 537 and may be taken only once for credit. This is the first course in a sequence of two: Mus 437 and Mus 438.
Prerequisite: by audition.

Mus 439 - Instrumental Literature (3)
An intensive study of the development of literature for various individual or groups of instruments (e.g., flute, clarinet, oboe, bassoon, saxophone, trumpet, horn, trombone, tuba, violin, viola, cello, bass, percussion, brass, woodwinds, strings). The course may be listed with the specific instrument in the title. Also offered for graduate-level credit as Mus 539 and may be taken only once for credit.
Prerequisite: Mus 304, Mus 305, Mus 306.

Mus 446 - Coordinate Movement Master Class (1)
Provides pianists with information about the structure and function of the body as it relates to playing the piano. Also offered for graduate-level credit as Mus 546 and may be taken only once for credit. This is the second course in a sequence of three: Mus 446, Mus 447, and Mus 448.
Prerequisite: at least three years piano performance experience.

Mus 447 - Coordinate Movement Master Class (1)
Provides pianists with information about the structure and function of the body as it relates to playing the piano. Also offered for graduate-level credit as Mus 547 and may be taken only once for credit. This is the second course in a sequence of three: Mus 446, Mus 447, and Mus 448.
Prerequisite: at least three years piano performance experience.

Mus 448 - Coordinate Movement Master Class (1)
Provides pianists with information about the structure and function of the body as it relates to playing the piano. Also offered for graduate-level credit as Mus 548 and may be taken only once for credit. This is the third course in a sequence of three: Mus 446, Mus 447, and Mus 448.
Prerequisite: at least three years piano performance experience.

Mus 452 - Advanced Keyboard Skills (3)
This course investigates and applies advanced theoretical concepts to keyboard playing and improvisation. Applications include sightreading, transposition, harmonization, and figured bass reading. Also offered for graduate-level credit as Mus 552 and may be taken only once for credit. This is the second course in a sequence of two: Mus 451 and Mus 452.
Prerequisite: by audition.

Mus 471 - Advanced Jazz Improvisation (2)
Advanced concepts of jazz improvisation. Principles of pentatonics, diminished harmonies, inside-outside playing, synthetic scales, and free improvisation. Instructor approval required. Also offered for graduate-level credit as Mus 571 and may be taken only once for credit. This is the first course in a sequence of three: Mus 471, Mus 472, and Mus 473.
Prerequisite: Mus 271, Mus 272, and Mus 273.

Mus 472 - Advanced Jazz Improvisation (2)
Advanced concepts of jazz improvisation. Principles of pentatonics, diminished harmonies, inside-outside playing, synthetic scales, and free improvisation. Instructor approval required. Also offered for graduate-level credit as Mus 572 and may be taken only once for credit. This is the second course in a sequence of three: Mus 471, Mus 472, and Mus 473.
Prerequisite: Mus 271, Mus 272, and Mus 273.

Mus 473 - Advanced Jazz Improvisation (2)
Advanced concepts of jazz improvisation. Principles of pentatonics, diminished harmonies, inside-outside playing, synthetic scales, and free improvisation. Instructor approval required. Also offered for graduate-level credit as Mus 573 and may be taken only once for credit. This is the third course in a sequence of three: Mus 471, Mus 472, and Mus 473.
Prerequisite: Mus 271, Mus 272, and Mus 273.
Mus 474 - Midi Applications (2)
Study of the fundamentals of MIDI and computer music programs. Includes work on synthesizers, sequencing, and notation software. Also offered for graduate-level credit as Mus 574 and may be taken only once for credit. This is the first course in a sequence of two: Mus 474 and Mus 475.
Prerequisite: consent of instructor.

Mus 475 - Midi Applications (2)
Study of the fundamentals of MIDI and computer music programs. Includes work on synthesizers, sequencing, and notation software. Also offered for graduate-level credit as Mus 575 and may be taken only once for credit. This is the second course in a sequence of two: Mus 474 and Mus 475.
Prerequisite: consent of instructor.

Mus 476 - Computer Music Composition (3)
Introduces concepts, applications, and projects in sound synthesis, sampling, and digital signal processing. Students learn to create real time compositions using a graphical programming environment and studio pieces using various sound editing applications.
Prerequisite: Mus 242 or permission of instructor.

Mus 481 - Pedagogy (3)
Methods, materials, curriculum, and philosophical bases for teaching in a private studio and classroom with focus on individual and group instruction. Also offered as graduate-level credit as Mus 581 and may be taken only once for credit. This is the first course in a sequence of three: Mus 481, Mus 482, and Mus 483.
Prerequisite: Mus 213, Mus 216, Mus 304, Mus 305, Mus 306.

Mus 482 - Pedagogy (3)
Methods, materials, curriculum, and philosophical bases for teaching in a private studio and classroom with focus on individual and group instruction. Also offered as graduate-level credit as Mus 582 and may be taken only once for credit. This is the second course in a sequence of three: Mus 481, Mus 482, and Mus 483.
Prerequisite: Mus 213, Mus 216, Mus 304, Mus 305, Mus 306.

Mus 483 - Pedagogy (3)
Methods, materials, curriculum, and philosophical bases for teaching in a private studio and classroom with focus on individual and group instruction. Also offered as graduate-level credit as Mus 583 and may be taken only once for credit. This is the third course in a sequence of three: Mus 481, Mus 482, and Mus 483.
Prerequisite: Mus 213, Mus 216, Mus 304, Mus 305, Mus 306.

Mus 484 - Music with Children (3)
Methods and materials for teaching general music classes in the elementary school. Designed for the music specialist; required of all students who seek a basic teaching certificate in music. It is presupposed that all students have performing and theoretical skills and at least one year of music history. Concurrent enrollment in an appropriate practicum (Mus 409) required.
Prerequisite: upper division standing in music.

Mus 485 - Diction for Singers: Italian, German, and French (2)
Designed for singers and other musicians interested in classical vocal literature in Italian, German, and French. It presents the principles of lyric diction and provides practice in the skills needed to sing the language correctly, idiomatically, and expressively. Also offered for graduate-level credit as Mus 585 and may be taken only once for credit. This is the first course in a sequence of three: Mus 485, Mus 486, and Mus 487.

Mus 486 - Diction for Singers: Italian, German, and French (2)
Designed for singers and other musicians interested in classical vocal literature in Italian, German, and French. It presents the principles of lyric diction and provides practice in the skills needed to sing the language correctly, idiomatically, and expressively. Also offered for graduate-level credit as Mus 586 and may be taken only once for credit. This is the second course in a sequence of three: Mus 485, Mus 486, and Mus 487.

Mus 487 - Diction for Singers: Italian, German, and French (2)
Designed for singers and other musicians interested in classical vocal literature in Italian, German, and French. It presents the principles of lyric diction and provides practice in the skills needed to sing the language correctly, idiomatically, and expressively. Also offered for graduate-level credit as Mus 587 and may be taken only once for credit. This is the third course in a sequence of three: Mus 485, Mus 486, and Mus 487.

Mus 501 - Research (1-9)
(Credit to be arranged.) Consent of instructor.

Mus 502 - Independent Study (1-9)
(Credit to be arranged.)

Mus 503 - Thesis (1-9)
Thesis (Credit to be arranged.)

Mus 504 - Cooperative Education/Internship (1-9)
(Credit to be arranged.)

Mus 505 - Reading and Conference (1-6)
(Credit to be arranged.)

Mus 506 - Graduate Project or Recital (1-4)
Final conducting project or performance recital required for all Master of Music degrees.

Mus 507 - Seminar (1-6)
(Credit to be arranged.) Consent of instructor. Recent topics have included Style Analysis; Style Criticism; Music History; Music in the Elementary School; Seminar in Composition.

Mus 508 - Workshop (1-6)
(Credit to be arranged.)

Mus 509 - Practicum (1-9)
(Credit to be arranged.)

Mus 510 - Selected Topics (1-6)
(Credit to be arranged.)

Mus 511 - Music Research Methods (3)
A systematic study of research techniques and materials in music history, literature, and music education. Emphasis on the use of
Prerequisite: graduate standing in music.

Mus 512 - Graduate Theory Review (3)
A course designed for graduate students who need to review their knowledge of basic theoretical concepts. Can be taken for credit but will not be applied toward completion of degree requirements.

Mus 513 - Score Reading (3)
Techniques for reading and studying scores with a goal of performance.

Mus 517 - Advanced Harmony (2)
A study of the harmonic practices of the late 19th and 20th centuries. Written work, analysis, and theoretical research. This is the first course in a sequence of three: Mus 517, Mus 518, and Mus 519.

Prerequisite: Mus 316.

Mus 518 - Advanced Harmony (2)
A study of the harmonic practices of the late 19th and 20th centuries. Written work, analysis, and theoretical research. This is the second course in a sequence of three: Mus 517, Mus 518, and Mus 519.

Prerequisite: Mus 316.

Mus 519 - Advanced Harmony (2)
A study of the harmonic practices of the late 19th and 20th centuries. Written work, analysis, and theoretical research. This is the third course in a sequence of three: Mus 517, Mus 518, and Mus 519.

Prerequisite: Mus 316.

Mus 520 - Analytical Techniques (3)
Study of the formal structure of musical compositions of various styles with the purpose of discovering the sources of unity, variety, order, and expression present in them.

Prerequisite: Successful completion of the department’s graduate entrance examination.

Mus 521 - Advanced Band Arranging (3)
Designed to develop fundamental skills in arranging music for concert, marching and stage bands, and small wind and/or percussion ensembles, such as those encountered in the public schools.

Transcription skills also will be studied. Emphasis will be on practical application of material presented.

Prerequisite: successful completion of the department’s graduate entrance examination.

Mus 522 - Advanced Orchestral Arranging (3)
Instruction in writing for instruments used in large orchestras, showing basic techniques of scoring for string quartet, woodwind and brass quintet, and percussion ensemble. Practical application through scoring of piano music for various orchestral groups of the nature and capability found in the public schools.

Prerequisite: successful completion of the department’s graduate entrance examination.

Mus 523 - Advanced Choral Arranging (3)
Study of voice types, text setting, and techniques of writing for various combinations of voices. Practice in arranging melodies for two-, three, and four-part choruses, mixed and unixed, such as those encountered in the public schools.

Prerequisite: successful completion of the department’s graduate entrance examination.

Mus 524 - Instrumental Jazz Arranging (2)
In-depth study and application of the fundamentals of composing and arranging for small to large jazz ensembles. Subjects included are history, transposition, instruments, forms, harmonic and melodic construction, rhythm section, voicing, moving harmonization, score and part preparation, vocal arranging techniques, rehearsal techniques, and MIDI applications. Instructor approval required. Also offered for undergraduate-level credit as Mus 426 and may be taken only once for credit. This is the third course in a sequence of three: Mus 524, Mus 525, and Mus 526.

Mus 525 - Instrumental Jazz Arranging (2)
In-depth study and application of the fundamentals of composing and arranging for small to large jazz ensembles. Subjects included are history, transposition, instruments, forms, harmonic and melodic construction, rhythm section, voicing, moving harmonization, score and part preparation, vocal arranging techniques, rehearsal techniques, and MIDI applications. Instructor approval required. Also offered for undergraduate-level credit as Mus 426 and may be taken only once for credit. This is the third course in a sequence of three: Mus 524, Mus 525, and Mus 526.

Mus 526 - Instrumental Jazz Arranging (2)
In-depth study and application of the fundamentals of composing and arranging for small to large jazz ensembles. Subjects included are history, transposition, instruments, forms, harmonic and melodic construction, rhythm section, voicing, moving harmonization, score and part preparation, vocal arranging techniques, rehearsal techniques, and MIDI applications. Instructor approval required. Also offered for undergraduate-level credit as Mus 426 and may be taken only once for credit. This is the third course in a sequence of three: Mus 524, Mus 525, and Mus 526.

Mus 527 - Opera Workshop (1)
A workshop in preparing and performing operatic literature for advanced singers. Also offered for undergraduate-level credit as Mus 427 and may be taken only once for credit.

Prerequisite: consent of instructor through audition.

Mus 528 - Opera Production (2)
Annual production of a major operatic work. Designed for singers, orchestral instrumentalists, and technical support staff in the areas of costuming, set design, and other areas. Casting for production is by audition during winter quarter. Also offered for undergraduate-level credit as 428 and may be taken only once for credit.

Mus 529 - Grad History Review (3)
A course designed for graduate students who need to review their knowledge of basic historical concepts of music. Can be taken for credit but will not be applied toward completion of degree requirements.

Mus 530 - Song Literature (3)
Study of the solo literature for voice through analysis of scores and recordings and live performances. Historical perspectives from Elizabethan song to 20th-century art songs. Also offered for undergraduate-level credit as
Mus 531 - Chamber Music Literature (3)
Historical survey of the music associated with the chamber music repertoire from 1600-1950. Emphasis on analysis of scores and recordings. Also offered for undergraduate-level credit as Mus 431 and may be taken only once for credit.
Prerequisite: Mus 304, Mus 305, Mus 306.

Mus 532 - Band Wind Literature (3)
A study of literature for ensembles of wind and wind/percussion instruments from about 1600 to the present. Historical perspective will be gained through reading, style-analysis, and listening. Attention will be given to the practical application of band literature in elementary and secondary teaching situations. Also offered for undergraduate-level credit as Mus 432 and may be taken only once for credit.
Prerequisite: Mus 304, Mus 305, Mus 306.

Mus 533 - Orchestral Literature (3)
A historical survey of the music associated with the symphony orchestra from the development of each orchestral instrument to the present day. Intensive study of those works of great significance is achieved through score study and analysis of several interpretations through recordings. Attention will be given to the practical application of orchestral literature in elementary and secondary teaching situations. Also offered for undergraduate-level credit as Mus 433 and may be taken only once for credit.
Prerequisite: Mus 304, Mus 305, Mus 306.

Mus 534 - Choral Literature (3)
This course offers an investigation and analysis of literature for choir of all sizes, for secular and sacred use, particularly in relation to use in public school at the junior high and high school levels and in church choir situations. A survey of the development of choral literature from c. 1400 to the present, with examples via listening and study of scores, will be included. Also offered for undergraduate-level credit as Mus 434 and may be taken only once for credit.
Prerequisite: Mus 304, Mus 305, Mus 306.

Mus 536 - Opera Literature (3)
An intensive study of the development of opera in western music, from the works of Monteverdi in the early 17th century to the important operas of this century. Also offered for undergraduate-level credit as Mus 436 and may be taken only once for credit.
Prerequisite: Mus 304, Mus 305, Mus 306.

Mus 537 - Keyboard Literature (3)
A study of Baroque, Classical, Romantic, and Twentieth Century literature for keyboard instruments. In addition to providing an overview of the historical development of keyboard music, specific works from the repertoire of each period will be selected for intensive study and performance. Intended primarily for piano or harpsichord majors. Also offered for undergraduate-level credit as Mus 437 and may be taken only once for credit. This is the first course in a sequence of two: Mus 537 and Mus 538.
Prerequisite: by audition.

Mus 539 - Instrumental Literature (3)
An intensive study of the development of literature for various individual or groups of instruments (e.g., flute, clarinet, oboe, bassoon, saxophone, trumpet, horn, trombone, tuba, violin, viola, cello, bass, percussion, brass, woodwinds, strings). The course may be listed with the specific instrument in the title. Also offered for undergraduate-level credit as Mus 439 and may be taken only once for credit.
Prerequisite: Mus 304, Mus 305, Mus 306.

Mus 541 - Advanced Conducting Methods (3)
Study and analysis of the classic Jazz compositions and recordings.
Prerequisite: Mus 355.

Mus 541 - Advanced Conducting Methods (3)
Study of the concepts of conducting applied to a wide range of music literature. Music of different eras will be used to analyze and practice the conductor’s process. Incorporated into the study of conducting will be rehearsal techniques and relevant historical and theoretical concepts, providing an integrated study of the conductor’s art. This course is intended for MA/MS in Music graduate students, MM in Conducting graduate students, or senior-level undergraduate students with instructor permission.
Prerequisite: graduate standing in music or permission of instructor.

Mus 542 - Advanced Choral Conducting (3)
Study of the concepts of conducting applied to a wide range of choral music. Music of different eras will be used to analyze and practice the conductor’s process. Incorporated into the study of conducting will be rehearsal techniques and relevant historical and theoretical concepts, providing an integrated study of the conductor’s art. Particular attention given to the creative role of the University, Church, Community, and Public School Choir Director. This course is intended for MM in Conducting graduate students.
Prerequisite: graduate standing in music.

Mus 543 - Advanced Instrumental Conducting (3)
Study of the concepts of conducting applied to a wide range of instrumental music. Music of different eras will be used to analyze and practice the conductor’s process. Incorporated into the study of conducting will be rehearsal techniques and relevant historical and theoretical concepts, providing an integrated study of the conductor’s art. Particular attention given to the creative role of the University, Community, Professional, and Public School Band or Orchestra Conductor. This course is intended for MM in Conducting graduate students.
Prerequisite: graduate standing in music.

Mus 546 - Coordinate Movement Master Class (1)
Provides pianists with information about the structure and function of the body as it relates to playing the piano. Also offered for undergraduate-level credit as Mus 446 and may be taken only once for credit. This is the first course in a sequence of three: Mus 546, Mus 547, and Mus 548.

Prerequisite: at least three years piano performance experience.

Mus 547 - Coordinate Movement Master Class (1)
Provides pianists with information about the structure and function of the body as it relates to playing the piano. Also offered for undergraduate-level credit as Mus 447 and may be taken only once for credit. This is the second course in a sequence of three: Mus 546, Mus 547, and Mus 548.

Prerequisite: at least three years piano performance experience.

Mus 548 - Coordinate Movement Master Class (1)
Provides pianists with information about the structure and function of the body as it relates to playing the piano. Also offered for undergraduate-level credit as Mus 447 and may be taken only once for credit. This is the third course in a sequence of three: Mus 546, Mus 547, and Mus 548.

Prerequisite: at least three years piano performance experience.

Mus 549 - Coordinate Movement Master Class (1)
Provides pianists with information about the structure and function of the body as it relates to playing the piano. Also offered for undergraduate-level credit as Mus 449 and may be taken only once for credit. This is the fourth course in a sequence of three: Mus 546, Mus 547, and Mus 548.

Prerequisite: at least three years piano performance experience.

Mus 550 - Music History: The Medieval Period (2)
Intensive, analytical study of the history of music of the Middle Ages and its relationship to contemporary historical events.

Prerequisite: successful completion of the department's graduate entrance examination. Normally limited to graduate music majors only.

Mus 551 - Music History: The Renaissance Period (2)
Intensive, analytical study of the history of music from 1400 to 1600 and its relationship to contemporary historical events.

Prerequisite: successful completion of the department's graduate entrance examination. Normally limited to graduate music majors only.

Mus 552 - Music History: The Baroque Period (2)
Intensive, analytical study of the history of music from 1600 to 1750 and its relationship to contemporary historical events.

Prerequisite: successful completion of the department's graduate entrance examination. Normally limited to graduate music majors only.

Mus 553 - Music History: The Classical Period (2)
Intensive, analytical study of the history of music from 1750 to 1825 and its relationship to contemporary historical events.

Prerequisite: successful completion of the department's graduate entrance examination. Normally limited to graduate music majors only.

Mus 554 - Music History: The Romantic Period (2)
Intensive, analytical study of the history of music from 1825 to 1900 and its relationship to contemporary historical events.

Prerequisite: successful completion of the department's graduate entrance examination. Normally limited to graduate music majors only.

Mus 555 - Music History: The Modern Period (2)
Intensive, analytical study of the history of music from 1900 to 1950 and its relationship to contemporary historical events.

Prerequisite: successful completion of the department's graduate entrance examination. Normally limited to graduate music majors only.

Mus 556 - Music History: The Postmodern Period (2)
Intensive, analytical study of the history of music since 1950 and its relationship to contemporary historical events.

Prerequisite: successful completion of the department's graduate entrance examination. Normally limited to graduate music majors only.

Mus 557 - Jazz History (2)
Advanced studies in Jazz History. Course involves individual research projects culminating in student class presentations.

Mus 558 - Advanced Jazz Improvisation (2)
Advanced concepts of jazz improvisation. Principles of pentatonics, diminished harmonies, inside-outside playing, synthetic scales, and free improvisation. Instructor approval required. Also offered for undergraduate-level credit as Mus 471 and may be taken only once for credit. This is the first course in a sequence of three: Mus 571, Mus 572, and Mus 573.

Prerequisite: Mus 271, Mus 272, and Mus 273.

Mus 559 - Advanced Jazz Improvisation (2)
Advanced concepts of jazz improvisation. Principles of pentatonics, diminished harmonies, inside-outside playing, synthetic scales, and free improvisation. Instructor approval required. Also offered for undergraduate-level credit as Mus 472 and may be taken only once for credit. This is the second course in a sequence of three: Mus 571, Mus 572, and Mus 573.

Prerequisite: Mus 271, Mus 272, and Mus 273.

Mus 560 - Music History: The Baroque Period (2)
Intensive, analytical study of the history of music from 1600 to 1750 and its relationship to contemporary historical events.

Prerequisite: successful completion of the department's graduate entrance examination. Normally limited to graduate music majors only.

Mus 561 - Music History: The Renaissance Period (2)
Intensive, analytical study of the history of music from 1400 to 1600 and its relationship to contemporary historical events.

Prerequisite: successful completion of the department's graduate entrance examination. Normally limited to graduate music majors only.

Mus 562 - Music History: The Baroque Period (2)
Intensive, analytical study of the history of music from 1600 to 1750 and its relationship to contemporary historical events.

Prerequisite: successful completion of the department's graduate entrance examination. Normally limited to graduate music majors only.

Mus 563 - Music History: The Classical Period (2)
Intensive, analytical study of the history of music from 1750 to 1825 and its relationship to contemporary historical events.

Prerequisite: successful completion of the department's graduate entrance examination. Normally limited to graduate music majors only.

Mus 564 - Music History: The Romantic Period (2)
Intensive, analytical study of the history of music from 1825 to 1900 and its relationship to contemporary historical events.

Prerequisite: successful completion of the department's graduate entrance examination. Normally limited to graduate music majors only.

Mus 565 - Music History: Early 20th Century (2)
Intensive, analytical study of the history of music from 1900 to 1950 and its relationship to contemporary historical events.

Prerequisite: successful completion of the department's graduate entrance examination. Normally limited to graduate music majors only.

Mus 566 - Music History: Music Since 1950 (2)
Intensive, analytical study of the history of music since 1950 and its relationship to contemporary historical events.

Prerequisite: successful completion of the department's graduate entrance examination. Normally limited to graduate music majors only.

Mus 567 - Jazz History (2)
Advanced studies in Jazz History. Course involves individual research projects culminating in student class presentations.

Mus 568 - Advanced Jazz Improvisation (2)
Advanced concepts of jazz improvisation. Principles of pentatonics, diminished harmonies, inside-outside playing, synthetic scales, and free improvisation. Instructor approval required. Also offered for undergraduate-level credit as Mus 471 and may be taken only once for credit. This is the first course in a sequence of three: Mus 571, Mus 572, and Mus 573.

Prerequisite: Mus 271, Mus 272, and Mus 273.

Mus 569 - Advanced Jazz Improvisation (2)
Advanced concepts of jazz improvisation. Principles of pentatonics, diminished harmonies, inside-outside playing, synthetic scales, and free improvisation. Instructor approval required. Also offered for undergraduate-level credit as Mus 472 and may be taken only once for credit. This is the second course in a sequence of three: Mus 571, Mus 572, and Mus 573.

Prerequisite: Mus 271, Mus 272, and Mus 273.

Mus 570 - Advanced Jazz Improvisation (2)
Advanced concepts of jazz improvisation. Principles of pentatonics, diminished harmonies, inside-outside playing, synthetic scales, and free improvisation. Instructor approval required. Also offered for undergraduate-level credit as Mus 473 and may be taken only once for credit. This is the third course in a sequence of three: Mus 571, Mus 572, and Mus 573.

Prerequisite: Mus 271, Mus 272, and Mus 273.

Mus 571 - Advanced Jazz Improvisation (2)
Advanced concepts of jazz improvisation. Principles of pentatonics, diminished harmonies, inside-outside playing, synthetic scales, and free improvisation. Instructor approval required. Also offered for undergraduate-level credit as Mus 471 and may be taken only once for credit. This is the first course in a sequence of three: Mus 571, Mus 572, and Mus 573.

Prerequisite: Mus 271, Mus 272, and Mus 273.

Mus 572 - Advanced Jazz Improvisation (2)
Advanced concepts of jazz improvisation. Principles of pentatonics, diminished harmonies, inside-outside playing, synthetic scales, and free improvisation. Instructor approval required. Also offered for undergraduate-level credit as Mus 472 and may be taken only once for credit. This is the second course in a sequence of three: Mus 571, Mus 572, and Mus 573.

Prerequisite: Mus 271, Mus 272, and Mus 273.

Mus 573 - Advanced Jazz Improvisation (2)
Advanced concepts of jazz improvisation. Principles of pentatonics, diminished harmonies, inside-outside playing, synthetic scales, and free improvisation. Instructor approval required. Also offered for undergraduate-level credit as Mus 473 and may be taken only once for credit. This is the third course in a sequence of three: Mus 571, Mus 572, and Mus 573.

Prerequisite: Mus 271, Mus 272, and Mus 273.

Mus 574 - Midi Applications (2)
Study of the fundamentals of MIDI and computer music programs. Includes work on synthesizers, sequencing, and notation software. Also offered for undergraduate-level credit as Mus 474 and may be taken only once for credit. This is the first course in a sequence of two: Mus 574 and Mus 575.

Prerequisite: consent of instructor.
Mus 575 - Midi Applications (2)
Study of the fundamentals of MIDI and computer music programs. Includes work on synthesizers, sequencing, and notation software. Also offered for undergraduate-level credit as Mus 475 and may be taken only once for credit. This is the second course in a sequence of two: Mus 574 and Mus 575.
Prerequisite: consent of instructor.

Mus 581 - Pedagogy (3)
Methods, materials, curriculum, and philosophical bases for teaching in a private studio and classroom with focus on individual and group instruction. Also offered as undergraduate-level credit as Mus 481 and may be taken only once for credit. This is the first course in a sequence of three: Mus 581, Mus 582, and Mus 583.
Prerequisite: Mus 213, Mus 216, Mus 304, Mus 305, Mus 306.

Mus 582 - Pedagogy (3)
Methods, materials, curriculum, and philosophical bases for teaching in a private studio and classroom with focus on individual and group instruction. Also offered as undergraduate-level credit as Mus 482 and may be taken only once for credit. This is the second course in a sequence of three: Mus 581, Mus 582, and Mus 583.
Prerequisite: Mus 213, Mus 216, Mus 304, Mus 305, Mus 306.

Mus 583 - Pedagogy (3)
Methods, materials, curriculum, and philosophical bases for teaching in a private studio and classroom with focus on individual and group instruction. Also offered as undergraduate-level credit as Mus 483 and may be taken only once for credit. This is the third course in a sequence of three: Mus 581, Mus 582, and Mus 583.
Prerequisite: Mus 213, Mus 216, Mus 304, Mus 305, Mus 306.

Mus 584 - Music with Children (3)
Methods and materials for teaching general music classes in the elementary school. Designed for the music specialist; required of all students who seek a basic teaching certificate in music. It is presupposed that all students have performing and theoretical skills and at least one year of music history. Concurrent enrollment in an appropriate practicum (Mus 409) required.
Prerequisite: upper division standing in music.

Mus 585 - Diction for Singers: Italian, German, and French (2)
Designed for singers and other musicians interested in classical vocal literature in Italian, German, and French. It presents the principles of lyric diction and provides practice in the skills needed to sing the language correctly, idiomatically, and expressively. Also offered for undergraduate-level credit as Mus 485 and may be taken only once for credit. This is the first course in a sequence of three: Mus 585, Mus 586, and Mus 587.

Mus 586 - Diction for Singers: Italian, German, and French (2)
Designed for singers and other musicians interested in classical vocal literature in Italian, German, and French. It presents the principles of lyric diction and provides practice in the skills needed to sing the language correctly, idiomatically, and expressively. Also offered for undergraduate-level credit as Mus 486 and may be taken only once for credit. This is the second course in a sequence of three: Mus 585, Mus 586, and Mus 587.

Mus 587 - Diction for Singers: Italian, German, and French (2)
Designed for singers and other musicians interested in classical vocal literature in Italian, German, and French. It presents the principles of lyric diction and provides practice in the skills needed to sing the language correctly, idiomatically, and expressively. Also offered for undergraduate-level credit as Mus 487 and may be taken only once for credit. This is the third course in a sequence of three: Mus 585, Mus 586, and Mus 587.

Mus 588 - Advanced Choral Methods (3)
Designed for the experienced teacher. In addition to studies of current methods and trends in choral music teaching, the course also provides a forum for problem solving and dealing with special issues and problems in current choral music education.

Mus 594 - Chamber Music (1)
Instruction in the art of small ensemble performance; the established repertory of string, wind, keyboard, or vocal chamber music. Maximum: 6 credits.
Prerequisite: graduate standing in music.

Mus 595 - Band (1)
Maximum: 6 credits.
Prerequisite: graduate standing in music.

Mus 596 - Orchestra (1)
Maximum: 6 credits.
Prerequisite: graduate standing in music.

Mus 597 - Chorus (1)
Maximum: 6 credits.
Prerequisite: graduate standing in music.

Mus 598 - Jazz Lab Band (1)
Performance of jazz literature in a big band setting. Maximum: 6 credits.
Prerequisite: graduate standing in music.

NAS - Indigenous Nations Studies
NAS 201 - Introduction to Native American Studies (4)
Introduction to the principal subject matter and interdisciplinary methods of Native American studies. Topics include understanding traditional cultures and languages and their significance for contemporary native peoples; the political and legal status of Native Americans in the United States and at the U.N.; contemporary native communities and tribal governments; Native American literature, art, music, dance, both contemporary and traditional.

NAS 299 - Special Studies (1-4)
(Credit to be arranged.)

NAS 301 - Introduction to Native American Languages (4)
General introduction to the linguistic and cultural background of endangered native languages of North America. Topics include structure of native languages; relationship of language to other aspects of culture such as worldview, social organization, and story telling; history of language change and current tribal projects to revitalize native languages.
NAS 334 - Topics in Film Genres and Movements (4)
Study of major aesthetic, cultural, and social movements in film. This is the same course as Eng 334 and may be repeated with different topics.

NAS 334U - Topics in Film Genres and Movements (4)
Study of major aesthetic, cultural, and social movements in film. This is the same course as Eng 334 and may be repeated with different topics.

NAS 335 - Topics in Literature and Film (4)
Study of the interplay between the textual and cinematic presentation: how these media have treated specific historical, social, and cultural phenomena, as well as the ways literature and film have inspired and influenced each other in terms of content, form, and audience. This is the same course as Eng 335 and may be repeated for credit with different topics.

Crosslisted as: Eng 335.

NAS 335U - Topics in Literature and Film (4)
Study of the interplay between the textual and cinematic presentation: how these media have treated specific historical, social, and cultural phenomena, as well as the ways literature and film have inspired and influenced each other in terms of content, form, and audience. This is the same course as Eng 335 and may be repeated for credit with different topics.

Crosslisted as: Eng 335U.

NAS 399 - Special Studies (1-6)
(Credit to be arranged.)

NAS 401 - Research (1-8)
(Credit to be arranged.)

NAS 404 - Cooperative Education/Internship (1-12)
Prerequisites: NAS 201, and 8 upper-division credits in NAS or courses approved by adviser.

NAS 405 - Reading and Conference (1-8)
(Credit to be arranged.)

NAS 410 - Selected Topics (1-4)
(Credit to be arranged.)

NAS 417 - Maintenance and Revitalization of Endangered Languages (4)
General introduction to endangered language revitalization, with a focus on native languages of the Pacific Northwest. Topics include history of attempts to eradicate native languages and the effects on those languages and their communities; theoretical basis for revitalization; emerging tribal policies; and relations between linguists and native communities.

NAS 507 - Seminar (1-8)
(Credit to be arranged.)

Norw - Norwegian

Norw 101 - First-year Norwegian (4)
Beginning Norwegian. Emphasis on communication skills: listening, speaking, reading, writing. This is the first course in a sequence of three: Norw 101, Norw 102, and Norw 103.

Norw 102 - First-year Norwegian (4)
Beginning Norwegian. Emphasis on communication skills: listening, speaking, reading, writing. This is the second course in a sequence of three: Norw 101, Norw 102, and Norw 103.

Norw 103 - First-year Norwegian (4)
Beginning Norwegian. Emphasis on communication skills: listening, speaking, reading, writing. This is the third course in a sequence of three: Norw 101, Norw 102, and Norw 103.

Norw 199 - Special Studies (1-5)
(Credit to be arranged.)

Norw 201 - Second-year Norwegian (4)
Intensive review of basics introduced in first-year courses and further development of communication skills. This is the first course in a sequence of three: Norw 201, Norw 202, and Norw 203. Recommended prerequisite: Norw 103.

Norw 202 - Second-year Norwegian (4)
Intensive review of basics introduced in first-year courses and further development of communication skills. This is the second course in a sequence of three: Norw 201, Norw 202, and Norw 203. Recommended prerequisite: Norw 103.

Norw 203 - Second-year Norwegian (4)
Intensive review of basics introduced in first-year courses and further development of communication skills. This is the third course in a sequence of three: Norw 201, Norw 202, and Norw 203. Recommended prerequisite: Norw 103.

Norw 299 - Special Studies (1-5)
(Credit to be arranged.)

OMSE - Software Engineering

OMSE 500 - Principles of Software Engineering (3)
An introduction to software engineering in industry. This course focuses on understanding the nature of software engineering, the software engineering process, and the problems and solutions manifest in real software development and modification projects. Different models of the software engineering process are compared and contrasted. Current best practices in software engineering and various approaches to software process improvement are presented. Two years of software development experience is required for registration.

OMSE 506 - Special Projects (1-6)
(Credit to be arranged.)

OMSE 507 - Seminar (1-8)
(Credit to be arranged.)

OMSE 510 - Special Topics (1-4)
(Credit to be arranged.)

OMSE 511 - Managing Software Development (3)
Provides the knowledge and skills needed to plan, organize, lead, and control a software project. Topics include planning and estimating, measuring and controlling, and leading and directing a software project. Quantitative measures and risk management will be emphasized throughout the course. Students will prepare project plans for real or hypothetical software projects, to include effort, cost, and schedule estimates and risk management plans. Two years of software development experience is required for registration.
OMSE 513 - Professional Communication Skills for Software Engineers (3)

Covers the skills necessary for appropriate professional conduct and effective communication in a professional setting. It includes technical writing, making effective presentations, conducting effective meetings, conflict resolution, team and decision-making skills, and professional ethics. Students will engage in a project that covers the major topics of the course. Two years of software development experience is required for registration.

OMSE 514 - Computing Foundations (3)

Introduction to the building blocks of a basic computing machine including the central processing unit, data transfer buses, registers, program counters, various types of memories, and instruction sets. A range of processor architectures and organizations including pipelining, virtual memory and caching are explored. Also explores the principles of operating systems and how they relate to the underlying hardware structures as well as concurrency, process synchronization, process scheduling, memory management, interrupt handling, and device management. Basic understanding of C or C++ required.

OMSE 515 - Software Foundations (3)

Introduction to fundamental language constructs including pointers, recursion and abstraction, and the principles of algorithmic analysis and Big-O notation. Progressively explores several foundation data structures and algorithms including linked lists, trees, hashing, and graphs which are illustrated using C, C++ and Java code fragments. Introduces selected topics in statistics and discrete mathematics, in particular, sets, set operations, propositional calculus, first-order predicate calculus and finite state machines. Registration requires permission of the OMSE program office. Recommended prerequisite: Mth 112.

OMSE 516 - Software Process Improvement (3)

How to effectively introduce improvements to software engineering processes in their organization. Designed to help the student successfully discover and improve software engineering practices in such areas as software requirements, architecture, design, coding, integration and testing. Technical issues are emphasized but balanced with real-world considerations including organizational politics, corporate culture, and psychology.

Prerequisite: OMSE 500.

OMSE 517 - Agile Software Development (3)

Designed for graduate level software engineering students who are interested in learning and applying the fundamentals of the Agile software development process in the real world. Explores Agile concepts both in theory and practice. Introduction to the principles and foundations of Agile Development, XP (Extreme Programming) and the SCRUM methodology. Also introduces the students to day-to-day life on an Agile team. Expected preparation: OMSE 500.

OMSE 521 - Using Metrics and Models to Support Quantitative Decision Making (3)

Provides the knowledge and skills needed to apply quantitative tools based on metrics and models of the software product and development process to make decisions under uncertainty. Topics covered will include measurement concepts, decision-making under uncertainty, and model and metric development for the software development enterprise. Foundation coursework is required for registration.

OMSE 522 - Modeling and Analysis of Software Systems (3)

Abstract models are used to formalize specifications of software systems. Formalized reference specifications serve as a basis for the design of software implementations and for validating critical properties of software systems. Provides the fundamental mathematical concepts needed to understand abstract models of software and to reason about them. Foundation coursework is required for registration.

OMSE 525 - Software Quality Analysis (3)

Processes, methods, and techniques for developing quality software, for assessing software quality, and for maintaining the quality of software. Tradeoffs between software cost, schedule time, and quality. Integrating quality into the software development process; formal review and inspection methods; principles of testing and test planning; module design for testability; maintaining quality while supporting existing software. Two years of software development experience is required for registration.

OMSE 531 - Software Requirements Engineering (3)

Principles, tools, and techniques for requirements elicitation, specification, and analysis. Focus on understanding the role of requirements in the development process, goals of the requirements phase, essential difficulties of specifying requirements for real systems, and effective methods, tools, and techniques. Covers techniques for formally modeling and specifying software requirements with hands-on experience. Two years of software development experience is required for registration.

OMSE 532 - Software Architecture and Domain Analysis (3)

Methods and principles of the architectural design of complex, large-scale software systems to accommodate change and evolution through many product releases or versions. Survey of the major architectural styles, their strengths and weaknesses, and architectural trade-offs with respect to system goals and desired properties. Study of architectural approach to development of open systems and frameworks based on case studies. Software engineering of domain-specific software architectures for families of systems (e.g., product lines) including domain analysis, domain modeling, and design of domain-specific software architectures. Relation of software architecture to requirements and its effects on downstream design and software evolution. Students examine domain analysis and the architectural design process and products in the business context including the effect of decisions on cost and schedule. Foundation coursework is required for registration.

OMSE 533 - Software Design Techniques (3)

Covers the principles of software design and a survey of design methods, techniques, and tools. In-depth and hands-on study of at least one method such as object-oriented design as applied to a realistic industrial problem. Examines the effects of design decisions on the functional and non-functional properties of the software (e.g., ease of understanding, maintainability, and reuse) and how software engineering principles are applied to make appropriate...
OMSE 534 - Software Estimating (3)
Software estimating techniques and tools enable the responsible software engineering manager to assess project feasibility, secure adequate budgets, and manage project tasks and schedules. The student learns how to make viable software estimates to consistently inform software project planning, scheduling, and oversight. The full range of software estimating methods and tools are explored.
Prerequisite: OMSE 500, OMSE 511.

OMSE 535 - Software Implementation and Testing (3)
Covers the principles of implementing and verifying computer software. Implementation topics include coding style, packaging strategies, reuse, testability, and maintainability. Verification topics include structural (white box) testing and techniques for code verification. Also included will be verification and integration of foreign code; testing techniques and how to perform them; including code-based and specification-based testing; hands-on application of the testing process including test case generation; and test adequacy, test validation, test execution, and automation. Foundation coursework is required for registration.

OMSE 551 - Strategic Software Engineering (3)
Where traditional software engineering focuses on the development and maintenance of individual systems, strategic software engineering addresses the development of multiple systems over time. Significant gains in productivity, cost, and schedule can result from systematic improvement of the software development process and systematic reuse of life-cycle products over multiple developments. Covers the principles, methods, and tools for strategic software development including process modeling and improvement, developing programs as families of systems, and systematic approaches to code generation and the reuse of non-code products, including requirements and design.
Prerequisite: All previous OMSE courses.

OMSE 555 - Software Engineering Practicum I (3)
The objective of the practicum is to provide hands-on software engineering management and development experience applying the principles, methods, processes and tools learned from OMSE courses. The practicum is comprised of two parts and organized as two courses, OMSE 555 and OMSE 556 (3 credits each) completed in sequence. The class is grouped into one or more integrated project teams jointly undertaking a coordinated software engineering problem. The evaluation (grading) process equally weights group and individual performance. Problems undertaken by student teams apply the practices learned in OMSE classes across the software engineering process. Projects range from technical evaluations, analysis and specification, through architectural design to prototype development and testing. Every project involves applying best project management, quality assurance and configuration management practices. This is the second course in a sequence of two: OMSE 555 and OMSE 556 which must be taken in sequence.
Prerequisite: All core OMSE courses other than OMSE 555 and OMSE 556, namely, OMSE 500, OMSE 511, OMSE 513, OMSE 525, OMSE 531, OMSE 532, OMSE 533, OMSE 534, OMSE 535 and OMSE 551.

PAH - Public Administration: Health

PAH 320 - Health Ethics: Contemporary Issues (4)
Explores the theoretical, historical, and institutional contexts of health ethics across populations. Students will learn and apply practical skills to deconstruct and analyze ethical challenges across a continuum of health-related topics from the classical cases through contemporary debates regarding our global social health, social justice, and related issues.

PAH 320U - Health Ethics: Contemporary Issues (4)
Explores the theoretical, historical, and institutional contexts of health ethics across populations. Students will learn and apply practical skills to deconstruct and analyze ethical challenges across a continuum of health-related topics from the classical cases through contemporary debates regarding our global social health, social justice, and related issues.

PAH 399 - Special Studies (1-8)
(Credit to be arranged.)

PAH 410 - Selected Studies (1-6)
(Credit to be arranged.)

PAH 504 - Cooperative Ed/Internship (1-9)
(Credit to be arranged.)

PAH 505 - Reading and Conference (1-9)
(Credit to be arranged.)

PAH 509 - Practicum (1-6)
(Credit to be arranged.)
PAH 510 - Selected Studies (1-6)
(Credit to be arranged.)

PAH 541 - Organizational Behavior in Health Service Organizations (3)
Provides an overview of organizational theory and behavior in health services organizations. Emphasis is on developing an understanding of the factors and forces which influence the organization, behavior, and operations of health services delivery organizations through consideration of organizations, their environments, and the roles of individuals working in management. Recommended corequisite: PAH 574.

PAH 542 - Marketing in Health Services Organizations (3)
This course provides students with concrete tools and knowledge about marketing concepts and processes in health services and develops competencies for application of marketing principles for a range of health services organizations. Concepts of messaging are also addressed as a component of the marketing strategy.

PAH 543 - Culture and Health Care (3)
The course is designed to provide an examination of health delivery and outcomes and the influence of culture. Using readings in conjunction with interactive learning, students consider various cultures and their interactions with the health care system. Knowledge of the tools, techniques, and applications of cultural assessment and cultural competency will be achieved. This course is open to admitted students in the graduate programs in the Division of Public Administration and other appropriate graduate programs.

PAH 544 - Leadership and Governance in Health Services (3)
Class explores principles and practices of leadership and governance in a variety of health and human services organizations. Theories of leadership and models of governance are studied, and explored through case studies of local health and human services leaders and their governance relationships. Students also conduct self-assessments of present and future leadership practice and potential.
Prerequisite: PA 541, 571, 574.

PAH 570 - Health Administration (3)
An examination of issues related to the administration of health care systems. Topics include: changing patterns of health care, budget and financial management techniques, and political influences on health administration.

PAH 571 - Health Policy (3)
Centers on an investigation of the public policy process as it affects the health care field. Specific health care policies and programs are used to explore the characteristics of the health care policy process and the factors involved in the formulation, implementation, and evaluation of health care policies and programs. Also offered as PAH 671 and may be taken only once for credit. Recommended corequisite: PAH 574.

PAH 572 - Health Politics (3)
This course is designed to survey the inter-workings of health care legislation. By examining the nuts and bolts of health law development, a better understanding of health policy development within the context of the political system can be realized. Health legislation is examined in terms of historical analysis and the legislative process, including the role of interest groups, the use of information in the political system, the role of bureaucracy, and the budget process. Recommended corequisite: PAH 574.

PAH 573 - Values and Ethics in Health (3)
This course addresses issues and questions regarding values and ethics in health, with particular attention to public health practice and health policy and management. It provides students with opportunities to consider issues in health and social services that challenge values and pose ethical issues, and assists students in addressing these issues in the context of both personal and organizational values and beliefs. Specific course content includes, but is not limited to, ethical issues such as reproductive issues, emerging diseases, product liability, pharmaceutical controls, advertising, occupational and environmental issues, and research dilemmas.
Prerequisite: Completion of at least 30 credits of the graduate program.

PAH 574 - Health Systems Organization (3)
This course introduces basic concepts and issues in the organization, financing, and delivery of health services. The emphasis is on the systemic aspects of health services production and delivery which address the health needs of populations with respect to death, disease, disability, discomfort, and dissatisfaction. Students will examine the inter-relationships of system structures, subsystems, and processes, as well as their interactions with the larger social, cultural, economic and political environments in which they exist. The focus is on the United States, with international comparisons used to illustrate similarities and differences.

PAH 575 - Advanced Health Policy (3)
Provides students focusing on health policy analysis or advocacy the opportunity to explore specific areas of health policy in-depth. Taught as a seminar with students required to select two policy areas, develop readings and questions, and lead class discussion facilitated by the instructor. Coursework emphasizes the understanding, identification and development of successful and sustainable health policy including preparation of four brief, structured policy proposals.
Prerequisite: PAH 571.

PAH 576 - Strategic Management of Health Care Organizations (3)
This course provides prospective and current health care managers with the tools necessary to successfully manage their departments/organizations in a strategic manner. Course content will build upon the basic methods of strategic planning and management, with special attention paid addressing and managing the problems and challenges specific to the health care industry.
Prerequisite: PAH 541, 574; recommended corequisite PAH 587.

PAH 577 - Health Care Law and Regulation (3)
Course intended to be an introduction to the American legal system and the laws that affect public health and health care. Initially, course focuses on public legal relationships between governments and individuals, and proceeds to review private legal relationships between individuals or
organizations. Reviews the source of laws affecting health care, the basics of constitutional law, the right to privacy, state and federal regulation of health care, and negligence in health care. Wraps up with an introduction to cutting edge health care issues such as health care fraud and abuse compliance and medical record privacy.

Prerequisite: PAH 571, 574.

PAH 578 - Continual Improvement In Health Care (3)

Intended to introduce students to the concepts of continual improvement and illustrate applications of these concepts in health care. The basic content will be drawn from the industrial quality improvement literature; this will be elaborated through presentation and analysis of health care case studies. Students will gain an understanding of different approaches to process improvement and quality management and will be prepared to apply this knowledge in the practice setting.

Prerequisite: PAH 541, 574.

PAH 579 - Health Information Technology and Systems Management (3)

Advances in information technology are driving fundamental changes throughout health care and transforming the health care industry. Students will gain an understanding how to manage and use health information technology systems. The course will identify the various types of health care information systems, and assess the key issues confronting the management of such systems, including business needs, the relationship between organizational needs and technology capabilities, and the management and control of IT resources in a variety of health-related organizational settings.

Prerequisite: PAH 574.

PAH 580 - Health Services Human Resources Management (3)

Overview of human resources within the context of health care organizations. Focus on the practical application of human resources management principles in the work setting through discussion of situations common in health care environments. Elements of the situation evaluated from the health care employee and health care manager perspectives. Examples of techniques, forms, and tools will be discussed.

Prerequisite: PAH 574.

PAH 586 - Introduction to Health Economics (3)

Focuses on defining and measuring the performance of the health care sector, defining and explaining microeconomic concepts, and evaluating various policy initiatives to improve efficiency, equity, and technological progress in health care. Specific topics include description of the health care industry, production of health, measurement of health care price changes, theory of demand for health care, theory of production and cost, measurement of inputs and outputs, cost-benefit and cost-effectiveness analysis, and structure and functioning of markets. In addition, the role of government in a private economy in dealing with market failure is discussed, especially as it relates to the goal of assuring universal access to health care. Does not require any specific preparation in economics or mathematics, although graphical presentation of economic concepts is emphasized. Recommended corequisite: PAH 574.

PAH 587 - Financial Management of Health Services (3)

Focuses on the analysis and administration of resources in the health care field. Among the specific topics included in this course are financial statements, budgeting, cash flow, costing, capital decision making, sources of capital and operating funds, depreciation and government reimbursement schemes, and human resources planning and management.

Prerequisite: PAH 574. Recommended corequisite: PAH 586.

PAH 588 - Program Evaluation and Management In Health Services (3)

Introduces the theory and practice of program evaluation in the health services system. Includes multiple methods and uses of evaluation from the perspectives of managers, health professionals, and health services researchers, with an emphasis on the utilization of evaluation findings in program planning and management in health services. Course learning will be synthesized through a community-based learning experience involving working with a community partner to develop an evaluation framework and methodology for an existing or proposed health program.

PAH 589 - Research Methods in Health Services (3)

Provides an introduction to traditional methods of designing and conducting health services research. It is intended that at the completion of the course students will understand multiple approaches to health services research, be able to be both participants in and consumers of the research process, and will be competent in conducting critical appraisals of the health services literature and in writing research proposals.

Prerequisite: PHPM 52S, PHE 535.

PAH 603 - Dissertation (1-9)

Credits to be arranged.

PAH 607 - Doctoral Seminar in Health Systems & Policy (1)

Doctoral seminar in health systems and policy.

PAH 641 - Organizational Behavior in Health Service Organizations (3)

Provides an overview of organizational theory and behavior in health services organizations. Emphasis is on developing an understanding of the factors and forces which influence the organization, behavior, and operations of health services delivery organizations through consideration of organizations, their environments, and the roles of individuals working in management. Recommended corequisite: PAH 574.

PAH 660 - Contemporary Research in Health Systems and Policy (3)

Doctoral seminar covering current topics in health systems and policy research providing doctoral students in the Health Systems and Policy Ph.D. program an opportunity to develop multi-disciplinary perspectives on current issues in their area of research. This course is repeatable for up to 9 credits.

PAH 671 - Health Policy (3)

Centers on an investigation of the public policy process as it affects the health care field. Specific health care policies and programs are used to explore the characteristics of the health care policy process and the factors involved in the formulation, implementation, and
evaluation of health care policies and programs. Also offered as PAH 571 and may be taken only once for credit. Recommended corequisite: PAH 574.

PAH 673 - Values and Ethics in Health (3)
This course addresses issues and questions regarding values and ethics in health, with particular attention to public health practice and health policy and management. It provides students with opportunities to consider issues in health and social services that challenge values and pose ethical issues, and assists students in addressing these issues in the context of both personal and organizational values and beliefs. Specific course content includes, but is not limited to, ethical issues such as reproductive issues, emerging diseases, product liability, pharmaceutical controls, advertising, occupational and environmental issues, and research dilemmas.
Prerequisite: Completion of at least 30 credits of the graduate program.

PAH 674 - Health Systems Organization (3)
This course introduces basic concepts and issues in the organization, financing, and delivery of health services. The emphasis is on the systemic aspects of health services production and delivery which address the health needs of populations with respect to death, disease, disability, discomfort, and dissatisfaction. Students will examine the inter-relationships of system structures, subsystems, and processes, as well as their interactions with the larger social, cultural, economic and political environments in which they exist. The focus is on the United States, with international comparisons used to illustrate similarities and differences.

PAH 677 - Health Care Law and Regulation (3)
Course intended to be an introduction to the American legal system and the laws that affect public health and health care. Initially, course focuses on public legal relationships between governments and individuals, and proceeds to review private legal relationships between individuals or organizations. Reviews the source of laws affecting health care, the basics of constitutional law, the right to privacy, state and federal regulation of health care, and negligence in health care. Wraps up with an introduction to cutting edge health care issues such as health care fraud and abuse compliance and medical record privacy.
Prerequisite: PAH 571, PAH 574.

PAH 686 - Introduction to Health Economics (3)
Focuses on defining and measuring the performance of the health care sector, defining and explaining microeconomic concepts, and evaluating various policy initiatives to improve efficiency, equity, and technological progress in health care. Specific topics include description of the health care industry, production of health, measurement of health care price changes, theory of demand for health care, theory of production and cost, measurement of inputs and outputs, cost-benefit and cost-effectiveness analysis, and structure and functioning of markets. In addition, the role of government in a private economy in dealing with market failure is discussed, especially as it relates to the goal of assuring universal access to health care. Does not require any specific preparation in economics or mathematics, although graphical presentation of economic concepts is emphasized. Recommended corequisite: PAH 574.

PAH 689 - Research Methods in Health Services (3)
Provides an introduction to traditional methods of designing and conducting health services research. It is intended that at the completion of the course students will understand multiple approaches to health services research, be able to be both participants in and consumers of the research process, and will be competent in conducting critical appraisals of the health services literature and in writing research proposals.
Prerequisite: PHPM 525, PHE 535.

PAH 699 - Special Studies (1-6)
(Credit to be arranged.)
PAP-Public-Affairs-Policy

PAP 412 - Introduction to Policy Advocacy (3)
Examines the importance of public policy advocacy for public and nonprofit organizations and the impact of policy advocacy on society. Also offered for graduate-level credit as PAP 512 and may be taken only once for credit.
Prerequisite: upper-division standing.
PAP 513 - Ethics and Public Policy (4)
An examination of the normative dimensions of public policy, focusing both on the ethical issues raised by the means of policymaking as well as the values that might shape the ends of public policy. Also offered for undergraduate-level credit as PAP 413 and may be taken only once for credit.
Prerequisite: upper-division standing.

PAP 603 - Dissertation (1-15)
(Credits to be arranged.)

PAP 605 - Reading and Conference (1-9)
(Credit to be arranged.)

PAP 606 - Project (1-8)
(Credit to be arranged.)

PAP 607 - Seminar (1-8)
(Credit to be arranged.)

PAP 610 - Selected Studies (1-9)
(Credit to be arranged.)

PAP 611 - Normative Foundations of Governance (3)
A survey of the major theories of the normative basis of governance that have shaped approaches to political legitimacy in the modern era.

PAP 613 - Organization Theory and Behavior (3)
An examination of the structure and design of organizations, the interaction of organizations and their environment, and the behavior of individuals within organizations. Application to problems of administration and governance.

PAP 614 - Contemporary Governance (3)
Contemporary factors impacting governance worldwide: political instability and fragmentation of government; erosion in the jurisdiction and power of the nation state and its causes; the search for new approaches and substitutes to government; accelerated blurring of sector boundaries; increasing use of third party providers; and non-political boundaries.
Prerequisite: admission to the Ph.D. program in public administration and policy.

PAP 615 - Administrative Process (3)
The purpose of this course is to explore the nature of the administrative process and its relationship to organizational structure, process, and behavior within the broader context of programmatic and organizational governance. Emphasis will be placed on the following topics: the influence of structural alternatives on behavior; value systems and normative prescriptions; organizational culture; and the influence of the administrative process on the way in which agencies formulate and implement policy within the context of their respective legislative mandates.
Prerequisite: admission to the Ph.D. program in public administration and policy.

PAP 616 - Policy Process (3)
This course focuses on the politics of the policy process. It examines the role, influence, and interaction of legislatures, executives, bureaucracies, courts, policy communities, and citizens. The course follows the stages of policy development: problem definition, agenda setting, budgeting, authorization, implementation, and oversight. Case material is taken from federal, state, and local governments with special consideration given to the intergovernmental aspects of the policy process.
Prerequisite: admission to the Ph.D. program in public administration and policy.

PAP 617 - Proseminar in International Relations (4)
This course helps students understand the processes, design, and the philosophical foundations of research. The focus of this course is to train students to become researchers who can design professional-quality research, and write a research proposal that will satisfy the requirements for a doctoral dissertation or grant proposal.

PA - Public Administration

PA 299 - Special Studies (1-4)
(Credit to be arranged.)
PA 311 - Introduction to Civic Engagement (4)

This course examines the concept of civic engagement by exploring how relationships are strengthened and communication is nurtured among members of society, and how this contributes to a civic identity that promotes socially conscious thought and action. The course will examine the values, skills and actions that contribute to a sense of civic identity through assigned readings, lectures, discussions, group activities, and self-reflection. A central goal of this course is to help students prepare for a lifetime of responsible citizenship and civic engagement. This course includes a community-based learning project.

PA 311U - Introduction to Civic Engagement (4)

This course examines the concept of civic engagement by exploring how relationships are strengthened and communication is nurtured among members of society, and how this contributes to a civic identity that promotes socially conscious thought and action. The course will examine the values, skills and actions that contribute to a sense of civic identity through assigned readings, lectures, discussions, group activities, and self-reflection. A central goal of this course is to help students prepare for a lifetime of responsible citizenship and civic engagement. This course includes a community-based learning project.

PA 312 - Foundations of Community Leadership (4)

This course explores the role of community leadership in advancing civic engagement, civil society, civic capacity, community-building, reasoned debate and other key civic virtues in democratic societies. Students will integrate leadership theory with practical observations in the context of the United States’ socio-political history and the role of civic engagement in our evolving social system. The course builds a definition for community leadership that recognizes the close interface between the role of public servants as agents of policy implementation and the role of citizens as active stewards of the public good.

PA 312U - Foundations of Community Leadership (4)

This course explores the role of community leadership in advancing civic engagement, civil society, civic capacity, community-building, reasoned debate and other key civic virtues in democratic societies. Students will integrate leadership theory with practical observations in the context of the United States’ socio-political history and the role of civic engagement in our evolving social system. The course builds a definition for community leadership that recognizes the close interface between the role of public servants as agents of policy implementation and the role of citizens as active stewards of the public good.

PA 313 - Fundamentals of Public Service (4)

Exploration of how public service informs the roles of public/nonprofit organizations in social change. Introduction to conceptual public service frameworks and exploration of the historical dimensions, underlying values and external forces that shape contemporary public service. Ways for community members to influence public policy through civic engagement are addressed.

PA 313U - Fundamentals of Public Service (4)

Exploration of how public service informs the roles of public/nonprofit organizations in social change. Introduction to conceptual public service frameworks and exploration of the historical dimensions, underlying values and external forces that shape contemporary public service. Ways for community members to influence public policy through civic engagement are addressed.

PA 314 - Students as Leaders (4)

Introduces the concepts of leadership from theoretical and practical perspectives. Students will explore their own leadership competencies using the Social Change Model in relation to individuality, group dynamics and community building. Through in-class activities, interviews, and research, students will examine leadership as an individual/group process to create social change.

PA 314U - Students as Leaders (4)

Introduces the concepts of leadership from theoretical and practical perspectives. Students will explore their own leadership competencies using the Social Change Model in relation to individuality, group dynamics and community building. Through in-class activities, interviews, and research, students will examine leadership as an individual/group process to create social change.

PA 315 - Managing People for Change (4)

This course examines today’s workforce and the new competencies required to manage people to meet the corresponding modern day challenges. It borrows from contemporary discussions about public sector (government and nonprofit) organizations as well as private sector organizations. Topics include human capital, workplace politics, intergenerational challenges, and job/wage disparities.

Prerequisite: junior standing.

PA 315U - Managing People for Change (4)

This course examines today’s workforce and the new competencies required to manage people to meet the corresponding modern day challenges. It borrows from contemporary discussions about public sector (government and nonprofit) organizations as well as private sector organizations. Topics include human capital, workplace politics, intergenerational challenges, and job/wage disparities.

Prerequisite: junior standing.

PA 316 - Leadership in New Student Programs (3)

Focus on developing an understanding of the transitional needs of students and their families upon entering Portland State University (PSU). Explores the demographics of students and identifies student development theory in relationship to New Student Programs. Key topics include: utilizing the Change Model of Leadership Development, teamwork, communication, student development, leadership development, and diversity.

PA 399 - Special Studies (1-4)

(Credit to be arranged.)

PA 402 - Independent Studies (1-8)

(Credit to be arranged.)

PA 405 - Reading and Conference (1-8)

(Credit to be arranged.)

PA 406 - Special Projects (1-8)

(Credit to be arranged.) Consent of instructor.
PA 412 - Civic Engagement: The Role of Governing Institutions (4)

This course develops understanding of how local governments carry out their governance responsibilities and the roles they play within the larger scheme of the American democratic system. The goal is to assess how the structures and processes of local governments affect opportunities for democratic accountability, citizen participation, the development of civic capacity, citizenship and civic leadership.

Prerequisite: PA 311 or PA 312.

PA 413 - Civic Engagement: The Role of Individuals (4)

This course provides an overview of the role of the individual in civic engagement processes. Students will develop an understanding of the variety and forms of engagement processes in which individuals participate within local and national governments and public organizations. The course focuses on developing students’ ability to critically analyze a variety of civic engagement processes and understand the consequences, limitations, opportunities, and benefits of these various processes. Students will examine whether individuals have equal opportunities to engage in political and social decision-making structures, and how they serve as change agents to address social injustice.

Prerequisite: PA 311, 312 or 313.

PA 414 - Civic Engagement: The Role of Social Institutions (4)

Develops an understanding of the roles that social institutions (voluntary associations, public interest groups, educational and religious institutions, and nonprofit organizations) play within democratic societies. Additionally, the course investigates the literature on social institutions and social capital, including their historical development, modern forms, social functions, and ways in which they shape individuals’ participation in governing processes. Students will examine the relationships among socially sustainable communities, strong social institutions and private interests by analyzing the mechanisms that generate participation and deliberation.

Prerequisite: PA 311 or PA 312.

PA 415 - Civic Leadership Integrative Seminar (4)

This seminar is devoted to exploring, investigating, discussing, understanding, and synthesizing the theoretical understandings and practical applications of civic leadership. Students will have an opportunity to reflect upon, synthesize, and showcase their knowledge through development of a portfolio that demonstrates their learning about civic leadership.

Prerequisite: One of PA 311, 312 or 313, plus one of PA 412, 413 or 414.

PA 417 - Ethical Leadership (4)

Explores potential ethical conflicts faced by leaders in public and community service. The course will provide students with ethical leadership models that will help them to judge the ethical compromises that may put personal, professional, organizational, and public service values in conflict with one another. Coursework will include a review of the theoretical concepts that underpin ethical leadership and will explore their practical application through case studies and the experiences of elected and career public officials who have faced ethical dilemmas in public and community service.

Prerequisite: PA 312 or PA 313.

PA 420 - Introduction to Nonprofit Management (4)

Introduction to the importance of the nonprofit sector in contemporary society and examination of the sector’s contribution to the social, political, and economic economy. Emphasis placed on practical application of nonprofit management theory, helping students gain the knowledge and skills appropriate to taking on nonprofit leadership roles.

PA 425 - Grantwriting for Nonprofit Organizations (4)

Students will acquire necessary skills to write successful grant proposals for foundations and other private funders. Students will learn how to: develop a project idea, plan a project or program, cultivate and work with prospective funders, develop and write a proposal, and generally learn skills to strengthen the grant-seeking process.

PA 430 - Recruitment of Volunteers (2)

This course takes a marketing approach to volunteerism. Interactive activities and discussion build on applying basic principles of volunteerism; examining different styles of volunteering; building a recruiting plan; examining marketing for volunteers; and managing recruitment. Assignments are interactive and designed to build applicable skills.

Prerequisite: upper-division standing.

PA 431 - Training of Volunteers (2)

This course engages students in organizing training and continuing education sessions for volunteers. Topics include: how adults learn, learning styles, building content, measurable learning objectives, selecting the best teaching techniques, and evaluation of learning. Assignments are interactive and designed to build skills directly applicable to a manager of volunteers program.

Prerequisite: upper-division standing.

PA 432 - Leadership and Management of Volunteer Programs (2)

The healthy organization aligns support for staff who work with volunteers, makes volunteers an integral part of all work, provides staff development, and rewards staff accomplishments related to work with volunteers. In this course students will gain an understanding of the impact of communication style and leadership on volunteer programs.

Prerequisite: upper-division standing.

PA 433 - Evaluation and Recognition of Volunteer Programs (2)

Students are exposed to evaluation methods, types, and styles for programs and for individual volunteers. Motivational theories are connected to the effectiveness of different type of recognition. Assignments are interactive and designed to build skills directly applicable to a manager of volunteers program.

Prerequisite: upper-division standing.

PA 501 - Research (1-9)

(Credit to be arranged.)
PA 502 - Independent Study (1-9)  
(Credit to be arranged.)

PA 504 - Cooperative Education/Internship (1-9)  
(Credit to be arranged.)

PA 505 - Reading and Conference (1-6)  
(Credit to be arranged.)

PA 506 - Special Projects (1-6)  
(Credit to be arranged.) Consent of instructor.

PA 507 - Seminar (0-6)  
(Credit to be arranged.)

PA 508 - Reflective Practice (3)  
(Credit to be arranged.)

PA 509 - Organizational Experience (1-6)  
Final integrative experience required for all M.P.A. and M.P.A.:HA students, who have limited or no administrative experience, and for all M.P.H.:HMP students regardless of experience. The student completes a field experience with an appropriate agency, culminating in a project report systematically analyzing an administrative problem that is both instructive to the student and of importance to the agency. Students are required to attend an orientation seminar to aid them in planning how the field experience will integrate with their coursework and their career goals, and to cultivate the habit of reflective practice. PA 509 may only be taken after students have earned at least 42 credits in their program of study.

PA 510 - Selected Topics (0-6)  
(Credit to be arranged.)

PA 511 - Public Administration (3)  
The role of administration in a democratic society. The course surveys the field, the development of the profession and practices in public administration, and examines the legal, historical, economic, and political foundations of the American governmental and nonprofit traditions.

PA 512 - Case Analysis (3-6)  
This course is designed to provide mid-career students with administrative experience an opportunity to develop skills in the areas of reflective practice, administrative problem solving, consulting, and coaching. Students will be required to present a case problem they developed as the basis of an exercise in administrative problem solving and coaching for their fellow students.

Prerequisite: at least three years of full-time administrative or management experience in a public, nonprofit and/or healthcare organization and 42 hours of completed coursework toward the degree.

PA 513 - Administrative Ethics and Values (3)  
Explores values, ethics, and morality in public sector administration. It considers such concepts and issues as the following: personal and professional values and roles; the myth of value neutrality; the public interest; values, ethics, and change; value trade-offs; ethical ambiguities; ethical codes, fiscal ethics, and ethics and administrative discretion.

Prerequisite: PA 511.

PA 514 - Global Leadership and Management (3)  
Contemporary global realities require emerging public sector leaders to prepare themselves by learning adaptable leadership and management concepts and tools. This core course is designed to equip interested students, both from the U.S. and abroad, with professional skills and practical knowledge that will help them “to lead and manage responsibly” in a range of global settings.

PA 515 - Public Works Administration (3)  
A general overview of administrative practices in public works, including an evaluation of organizational practices, project management, and relationships to political processes. The course will consider actual problems in the administration of public works.

PA 516 - Current Issues in Public Management (3)  
Explores two major strategies for the reform of public organizations: (1) an economic-centered approach that emphasizes private market-place incentives and the measurement of outcomes and (2) a civic dialogue approach that advocates the use of deliberative processes, reliance on collaboration, and a greater role of nonprofit organizations in the design and delivery of public services. The purpose of this course is to examine these approaches within the context of traditional models that have guided the public policy and management role of the bureaucracy in the American system of democratic governance.

PA 517 - Leadership Development for Public Organizations (3)  
Course focuses on two activities: (1) use of assessment instruments to prepare individual leadership profiles and (2) an examination of various leadership theories with applications to specific leadership situations. The goal of the course is to assist participants in understanding their own individual leadership styles and capacities and to better appreciate what is required to successfully lead at an individual, team/group, organizational, and larger community level.

PA 518 - Leading Public Organizations (3)  
Course seeks to develop an understanding of the essential ingredients of leading public organizations, including creating a vision, developing support for the vision, and transforming the vision into an organizational legacy. It focuses on the distinctive role responsibilities of the leader as an agent of the organization within the larger community setting, thus distinguishing the course from other leadership classes that focus on either an individual or organizational perspective. As part of this larger external focus, participants acquire the knowledge and skills to undertake inter-jurisdictional and strategic planning, conflict management, to work with the media, and to develop and implement collaborative agreements.

PA 519 - Civic Capacity (3)  
Examines the factors that contribute to the capacity of communities to create social agreement and to sustain collective action over time. Provides students with an opportunity to evaluate current research on the factors that contribute to the development of social capital and to apply this research to field-based community building activities.

PA 520 - Introduction to Nonprofit Management (3)  
Introduces students to a wide range of management needs, problems, and issues of
not-for-profit organizations. It considers such issues as the following: the executive director as manager; aspects of governance; volunteer/staff relations; personnel administration; budgeting and financial management; fund raising and sources of revenue; long-range planning; and community organization.

PA 521 - History And Foundations of the Nonprofit Sector (3)

Provides an introduction to the history and development of the private, nonprofit sector in the United States. It explores theories and concepts that describe the social, political, legal, and economic meaning of volunteerism, philanthropy, and the nonprofit sector as a sector separate from government and business. It provides a specific focus on the relationship of nonprofit to government in the delivery of public services within the context of a welfare state.

PA 522 - Governance of Nonprofit Organizations (3)

Addresses the history and functions of boards in the nonprofit sector, including an examination of the roles of boards in governance and leadership; policy and administration; decision-making processes; board-staff relations; resource development; board composition and recruitment; ethics and liability; and current research on boards and organizational effectiveness.

PA 523 - Nongovernmental Organizations: Nonprofits on the World Stage (3)

Introduction to the history and development of Nongovernmental Organizations (NGOs) and the roles they play on the world stage. Examines the causes of the growth and significant role of NGOs in creating civil society, as well as the roles of NGOs in fighting oppression, safeguarding the environment, building and training workforces and advocating major societal changes.

PA 524 - Financial Management in Nonprofit Organizations (3)

Designed to provide participants without formal accounting or finance training with the conceptual framework and practical tools needed to provide strong fiscal management and fiscal leadership in the nonprofit environment. For students with formal finance and/or accounting background, the course will provide opportunities to compare and contrast fiscal management objectives and functions in nonprofit with those found in for profit and/or governmental entities. It is structured to illustrate the nonprofit fiscal management cycle: planning, execution, recording, reporting, and monitoring.

PA 525 - Grantwriting for Nonprofit Organizations (3)

The process of grant acquisition, beginning with the formulation of a fundable idea and concluding in an application and its review. Students are expected to identify potential funding sources, initiate inquiries, and develop an application for funds to support a program or study of special interest. The steps in this process are discussed in general terms and in the context of each student's application. The focus is the development of grants from private rather than public funders.

PA 526 - Fundamentals of Fundraising in Nonprofit Organizations (3)

Creating an environment for successful fund development within a nonprofit organization is a serious undertaking that requires a substantive understanding of, and experience with, development programs and fundraising practices. Course provides the learner with the basic theories, principles, and techniques for fund development.

PA 527 - New/Emerging Nonprofits: Development and Management (3)

Intended to develop knowledgeable leaders for the nonprofit sector that understand how to establish and manage newly emerging organizations. Examines a wide range of management and leadership needs, problems and issues that arise for an organization in its early years. Explores how an organization develops and emerges and how the traditional tasks of management: supervision, planning, budgeting, fundraising and marketing can be most effectively administered. Recommended prerequisites: PA 520 or PA 521.

PA 528 - Organizational Leadership and Decision Making in Nonprofit Organizations (3)

Introduces students to the theory and practice of leadership and decision-making in the nonprofit sector. It focuses on the relationship of leadership to management, governance, and organizational effectiveness of nonprofit organizations. It covers classic, modern, and contemporary theories of leadership, including trait, style, situational, contingency, charismatic, transactional, transformational, team, and contemporary approaches to leadership and decision-making.

PA 529 - Nonprofit Field Study in Oaxaca, Mexico (3-6)

An intensive immersion program in Oaxaca, Mexico, offered by the Institute for Nonprofit Management in the Hatfield School of Government. Course includes nonprofit field study and site visits, cultural immersion homestays, and visits to cultural sites. The program varies from year to year in the types of nongovernmental nonprofit organizations the students visit, based in part on the interests of the students who register. Site visits in recent years have included programs for juvenile offenders and gang members, human rights advocacy groups, medical clinics, an AIDS education program, and a coalition of environmental groups. On-site translation is provided so that proficiency in Spanish is not necessary, but Spanish language study is part of the immersion experience.

PA 533 - Public Policy: Origins and Process (3)

Drawing on the general concept of the policy cycle, this course explores the central actors, processes, and issues associated with all stages of the public policy process. The course considers the interactions among the branches and levels of government, interest groups, nonprofit organizations, and the private sector. Tensions among various forces that affect the development and implementation of policy approaches are considered throughout the course.

PA 534 - Administrative Law (3)

When policies receive the formal status of laws, they acquire a special significance for the executive and judicial branches. This course examines the process of policy implementation through the use of administrative discretion and the rule-making process. Delegation of legislative power, judicial review, informal adjudication, and the role of the administrative law judge are emphasized. The limits of discretionary authority are explored. Students address the theoretical,
practical, and ethical issues in implementation, giving particular attention to the relationship between stated goals and actual outcomes.

**PA 535 - Regulation: Policy and Practice (3)**

Regulatory policy is used in a wide range of contexts, from the environment to health care to financial management and more. This course focuses on the development and implementation of regulatory policies at all levels of government. It considers foundation concepts and processes from the constitutional basis for regulation to implementation through promulgation of administrative regulations to enforcement of regulatory policies. It also deals with the relationships among regulatory policy, administrative law, and politics.

**PA 536 - Strategic Planning (3)**

Provides an overview of the application of planning systems to public sector functions and explores newer “stakeholder” theories of planning, planning models, and the step-by-step process for initiating and engaging in strategic planning processes at various levels of government. Through the use of case studies and hands-on exercises, students are exposed to practical applications of strategic planning approaches and techniques.

**PA 537 - Law & Public Policy (3)**

Law and courts are critical to public policy. The policy process often starts with cases for which no formal policy exists. The seminar examines judges as policymakers and the operation the policy process when courts are involved. It considers critical issues in judicial policymaking, examines fields where courts have played important policy roles, contemplates difficulties faced by judges, and helps students develop techniques to analyze judicial policymaking.

**PA 538 - Advocacy and Political Participation by Nonprofit Organizations (3)**

Exploration of the role of citizen advocacy and political participation in the United States in the twenty-first century. Investigates the many meanings of the term “civil society,” as well as the role of nonprofit and voluntary organizations in lobbying and advocacy, and the role of citizen movements in shaping local, national and global democracy. Will discuss and analyze specific advocacy campaigns with a focus on strategy.

**PA 539 - National Policy Process (3)**

As a seminar in public administration, the National Policy Process is studied on-site in Washington, D.C. Attention is paid to the actors and the action of policy process, to the institutionalization of that process, and to the administrative components of that process. Meetings are arranged with key policy actors in appropriate organizations including the Office of Management and Budget, Congressional staff, lobbyists and think tanks, the General Accounting Office, regulatory boards, and various agencies. A current piece of legislation or set of legislative initiatives is used as a case study throughout the week.

**PA 540 - Administrative Theory and Behavior (3)**

Managing organizational systems to accomplish purposeful outcomes. Attention is given to how formal structures and informal processes influence organizational goals in public and nonprofit environments. This includes theories of organizational, group, and individual behavior, such as organizational design, power and authority, leadership, teamwork, communications, work design, and motivation. Emphasis is on managers and managing in public purpose organizations by reviewing major theories and their application and effective use.

Prerequisite: PA 511.

**PA 541 - Social Entrepreneurship (3)**

This course provides students with core theories and concepts of social entrepreneurship, and contemporary approaches to entrepreneurship for the public and nonprofit sector. It analyzes successful cases of social entrepreneurship and develops competencies to create organizations that generate revenues while serving a social mission. Students learn about setting up and managing social entrepreneurial ventures, focusing on the resources, impact and support structures for social entrepreneurs. Students are given the opportunity to develop their own social entrepreneurial design.

**PA 542 - Sustainable Development Implementation (3)**

Focuses on the challenges involved in attempting to turn international commitments and policy promises into action. Using examples from around the U.S. and around the world, we examine sustainable development policy implementation and operation in an effort to see what worked, what did not, and how implementation challenges can be addressed.

**PA 543 - Creating Collaborative Communities (3)**

Collaboration is perceived as an important method for addressing complex community issues through alliances with other organizations in the nonprofit, for-profit, and government organizations. This course introduces students to the theory and practice of collaboration through in-class and “living” case studies in the community. Students will learn the success factors, barriers to, and preconditions of collaboration at the intraorganizational, interorganizational, and intersectoral levels. They will explore the potential for using collaboration in a variety of community settings.

**PA 544 - International Field Experience (3)**

Students are teamed with counterpart public servants and public organizations in a foreign country to understand “what counts for success” in developing and implementing public policy initiatives. Students use this international comparative governance experience to reflect on the consequences for improving public service innovation and practices within their home organizations and jurisdictions in the United States. An additional important learning goal is to provide students with the knowledge and skills to work more effectively in cross-cultural team settings.

**PA 545 - Organizational Development (3)**

A consideration of organization development as a strategy for organizational change. This course emphasizes concepts and methodologies relating to organizational problem diagnosis, action research, planned change, change implementation and evaluation, and the development of appropriate interpersonal competencies and skills. Focuses on the public manager as change agent.

Prerequisite: PA 540.

**PA 546 - Supervision in the Public Sector (3)**

Focuses on the role of the supervisor in contemporary public and nonprofit
organizations and the knowledge, skills, and abilities needed to effectively perform this role. Among the topics considered are the ethics and values of supervision; work planning; delegating, motivating, and empowering; communicating effectively; developing a team; coping with conflict; monitoring and evaluating performance; and dealing with the boss(es).

PA 547 - Culture, Values and Leadership (3)

Students reflect the role of culture and values in shaping the role responsibilities of public service and nonprofit leaders. Draws from the fields of cultural anthropology, inter-cultural communication, and organizational theory to explore how public and nonprofit servants can become more effective through the integration of cultural diversity into their nonprofit and public service roles.

PA 549 - Cross-cultural Communication in the Public Sector (3)

An examination of intercultural communication aspects, processes, and scenarios occurring in public sector interactions. Emphasis on external client/constituent relationships. Development of intercultural awareness is a key goal introduced through class discussion, scenario investigation, and research projects. The course is highly interactive with class discussion required.

PA 550 - Managing Information Resources (3)

Considers information management and computer information systems as they affect public management and public policy. Basic concepts are covered, and emphasis is placed on the use of computerized information technologies as management tools for public sector administrators. Substantial use is made of case studies to highlight how the public sector manager may most appropriately and effectively use computer resources and avoid inappropriate and misleading use of these resources.

PA 551 - Analytic Methods in Public Administration I (3)

Topics to be covered include: research design, sampling methods and theory, data collection, techniques of data analysis and presentation, statistical reasoning, and computer applications for statistical analysis.

PA 552 - Analytic Methods in Public Administration II (3)

A continuation and expansion of topics covered in PA 551, focusing on analytic methods used in research and evaluation of public sector policies, systems, and programs. Topics to be covered may include: qualitative and quantitative applications in research design and data collection; statistical modeling, forecasting, program evaluation, and other areas of applied research.

Prerequisite: PA 551.

PA 553 - Sustainable Development Policy and Governance (3)

Provides a foundation in sustainability-related policy design, policy analysis and governance approaches at multiple jurisdictional levels and in different cultural and social contexts. Explores challenges and opportunities related to developing policies and governance models that address the complex social, economic and environmental aspects of sustainability. Examines the role systems thinking plays in policy development and analysis in order to achieve integration across scales and sectors. Relevant topical issues serve as the focus for exploring how policy development and governance develops on the ground.

PA 554 - Policy Analysis Research (3)

Course requires student to become proficient in the use of reference tools for successfully undertaking policy research. Students are required to identify a policy issue and to use library and online resources to track a piece of public policy through the stages of agenda-setting, legislative policy-making, administrative implementation, court adjudication, and follow-up analysis and evaluation of consequences. The course consists of a series of on-line exercises corresponding to each stage of the policy development and implementation process. The exercises are supplemented with discussion and lectures.

PA 555 - Program Evaluation and Management (3)

Examines program evaluation from the perspective of the public administrator. Covers the major approaches, methods, and concepts in the field of program evaluation. Topics include impact assessment, research design, qualitative evaluation methods, performance auditing, benefit-cost analysis, and other selected topics.

PA 556 - Public Contract Management (3)

Explores what happens when public sector organizations form working relationships with other agencies, communities, nonprofit organizations, or for-profit firms through contracts. It seeks to understand key elements of the formation, operation, and termination (or transformation) of these relationships and to do so from the perspective of the generalist manager rather than from a narrow technical view. The purpose here is not to debate whether government at all levels should do more contracting or less but to assess what happens when the decision is made to use contractual arrangements to perform services or provides materials.

PA 557 - Operations Research in Public Administration (3)

Addresses the need for today's public administrators to have some understanding of the increasingly important tools of management science and operations research. It has no prerequisite: quantitative or technical background is not required. A variety of topics will be covered, with some flexibility in choice of topics according to students' interest. Topics include: linear programming, queueing, simulation, decision analysis, forecasting, PERT/CPM, inventory analysis, and replacement analysis. Methods taught in the course will be in the context of public administration.

PA 558 - Managing Public Projects and Programs: From Local to Global (3)

Introduction to management concepts and tools required for the design, implementation and sustainability of public sector (government and non-governmental organizations) programs and projects. Draws on contemporary literature and case studies. Students apply their management learnings from this course to a real-life program or project.

PA 560 - Local Government Administration (3)

Introduction to public administration practice at the local government level. Addresses those factors that make local government administration unique, but informed by the fact that contemporary local government professionals are closely
connected to a wide range of intergovernmental and often cross-sectoral working relationships. Local government administration learn that leadership within the organization, engagement with the community, and work across organizational and jurisdictional boundaries.

**PA 561 - Intergovernmental Relations (3)**

This course addresses the complex web of intergovernmental relations that is essential to the successful operation of public administration and policy throughout the nation. At the core of these relationships is a set of concerns about the political, legal, fiscal, and organizational relationships across governments and sectors. This course provides an in-depth examination of the foundations and challenges of these relationships.

**PA 562 - Managing Employee Performance in the Public Sector (3)**

Managing human capital can be a challenging endeavor and doing so in the public sector, particularly in government, introduces the added burden of politics. This course explores the multifaceted nature of performance in the workplace including the political, legal, economical and managerial issues that often accompany addressing employee performance in the public sector (government and nonprofit). The goal is to manage and improve human resources while holding individual employees and public agencies accountable for organizational performance.

**PA 563 - Citizens and Administration (3)**

This course analyzes modern civic life and its challenges. Its major focus is the often ambiguous relationship between citizens and administrators in the political system. Other topics emphasized are: transformation of civic life in modern times, declining citizen trust in government, modern approaches to citizen participation in government, and the future of “civism” in the United States.

**PA 564 - Current Issues in Environmental Policy and Administration (3)**

Provides in-depth analysis of evolving issues in environmental and natural resources policy and administration. Topics for analysis vary from term-to-term. Examples of topics include: political approaches to sustainable development, issues in water and land, urban natural resource management, hazardous materials issues, the politics and policy of dams and dam removals, issues of governance in the Columbia River Basin, new models of environmental management. Noted practitioners from the region, senior administrators and advocates are frequent guest presenters in the class. Issues are developed and explored through multiple perspectives in the spirit of liberal education and professional development. The course meets the needs of advanced students, professionals in the community, and others with particular interest in current issues.

**PA 565 - Natural Resource Policy and Administration (3)**

Reviews the history, politics, and institutions related to current environmental and natural resource policy and its administration. Reviews policy domains like land and forest, water, energy, fish and wildlife, and environmental quality. Special attention is paid to policy and administrative governance issues like sustaining common pool goods, structuring intergovernmental relations, and evaluating policy implementation strategies of direct production, planning, regulation, and changing market incentives. A central premise is that natural resource administrators face a policy arena that is intrinsically problematic because of the dynamic nature of social values about natural resources, the long time horizon implicit in resource systems, the broadening geographic scale considered in natural resources decisions, and the interdependency of social and ecological communities. Recommended as a first course in the environmental and natural resource administration specialization.

**PA 566 - Water Resources Policy and Administration (3)**

Reviews the history, politics, and institutions related to current water policy and administration in the United States. Examines policy history leading to present institutional and legal arrangements for federal, tribal, regional, state, and local water quality and quantity decision making. Attention is given to the industrial development of the East and created water resources of the arid West as a way to understand changing social sentiments toward water and water policy. Examines the evolution of purpose in pollution laws from human health protection to include ecosystem health protection and explores implementation of such protection through “watershed” approaches to land use and water quality management by NGOs, and federal, state, and local government. A major theme is the problem of developing coherent water policies in a policy arena which has divided authority, plural traditions, and multiple resource and social issues.

**PA 567 - Energy Resources Policy and Administration (3)**

Reviews the history, politics, and institutions related to current energy policy and administration with particular attention to the Pacific Northwest and development of hydroelectric power. National energy policy history is reviewed including political, financial, and environmental problems. Explores the roles of interest groups; state, local, national, and international governments; and regional governing institutions. It explores the changing distribution of social costs and benefits as both a cause and result of policy change. Passage of the 1980 Northwest Power Act, the Northwest Power Planning Council created in the act, and the implementation of the act will be studied, as will current issues like energy conservation, regional power planning, deregulation and the status of institutions involved in energy policy, and Columbia basin fish and wildlife conservation.

**PA 568 - Forest Policy and Administration (3)**

Reviews the history, politics, and institutions related to forest resource policy and management. Focuses on how policy affecting public and private forest land is made and implemented. Case studies, largely from the northwestern United States, are used to examine these processes. History, laws, and programs relating to forest land ownership, public and private forest management, and associated environmental protection are studied at the federal and state levels. Special attention is given to understanding how public values about forests develop, and how public values affect public policy related to forests held by public, nonprofit, industrial, and private owners.
PA 569 - Fish and Wildlife Policy and Administration (3)

Reviews the history, politics, and institutions related to fish and wildlife policy and administration. Focuses on how policy affecting fish and wildlife is made and implemented. Case studies, largely from the northwestern United States, are used to examine these processes. Policy history is studied at the state and federal level with particular attention to the federalization of authority in this arena and the role of interest groups in policymaking and implementation. Current issues like endangered species, the role of tribes, biodiversity conservation, and inter-jurisdictional management of fish and wildlife are the focus of study.

PA 570 - Environmental and Natural Resource Leadership (3)

Skills, styles and attributes of those who lead natural resource and environmental organizations will be examined to enhance the leadership abilities of those in the class. Each class member will analyze presentations by current leaders, prepare a leadership prescription for an organization with which they are familiar, and design a leadership learning program. The course is intended for all those concerned with leadership in natural resource and environmental organizations, regardless of background. Considerable time will be devoted to exchange of information among those in the class.

PA 572 - Columbia River Basin Governance (3)

Uses Columbia River Basin governance as a case study to build an understanding of how organizational interests, culture, institutional identities, and values drive any collaborative governance framework. Examines the Basin’s governance history and the interests of major institutional actors through reading, writing, and expert panel discussion. Expected preparation: PA 540 Administrative Theory and Behavior.

PA 573 - Smart Grid and Sustainable Communities: Making the Smart Grid Work (3)

Provides students with a basic understanding of Smart Grid technology and the conditions that need to be in place for its success as a policy tool for reducing CO2 emissions. Students will be provided with the historical development of the technology and its current status from the standpoint of policy implementation. Expected preparation: PA 540 Administrative Theory and Behavior.

PA 574 - Food and Agriculture Policy (3)

Course explores food- and agriculture policy development and implementation at global, national, and local levels. Examines the social, economic and environmental aspects of food and agricultural systems, including impacts of trade and aid policies, the Farm Bill, food system frameworks, and cross-cutting issues including water resources, toxics, and social equity.

PA 581 - Advanced Fundraising (3)

Focus on the understandings, processes, and skills that are necessary for successful major gift development. As a skill development course, it follows the Fundamentals of Fundraising course (PA 526) which provides theory and content. The course will address the process of developing advanced fundraising techniques, beginning with the formulation of the development plan, moving through developing a gift management system, and concluding with application and design of effective gift stewardship. The steps in the process are identified in general terms with specific application applied to the context of student experience or projects. The course will also cover the role of leadership especially volunteer leadership and the relationship of that leadership with other human resources such as the Development Officer and the Chief Executive Officer. Expected preparation: PA 526.

PA 582 - Public Budgeting (3)

Focuses on the major dimensions of public sector budgetary systems. Major emphasis will be devoted to the local budget processes. Topics will include basic concepts of public budgeting, the budget cycle, budget strategy, planning and presentation, alternative budgeting systems, the budget as a political and management tool.

PA 583 - Advanced Budgeting Concepts and Techniques (3)

Investigates how budgeting can be used to review, analyze, and establish public policy and administrative accountability. Students learn how to: 1) design the best budget system to fit various political environments; 2) review the effectiveness and efficiency of programs through budget analyses; and 3) use the budget to clarify public policy issues and establish management accountability for performance. The mechanics of public budgeting will also be discussed in detail, including developing a budget calendar, making fund balance estimates, balancing revenues and expenditures, and monitoring the approved budget. Students should have practical experience or a previous course in budgeting.

PA 585 - Financial Management in the Public Sector (3)

An investigation of the sources, methods, and mechanisms available for financing public organizations in a dynamic and complex environment. It includes a consideration of the administrative and behavioral as well as the economic dimensions of financing public organizations. The examination identifies and explores the skills which are appropriate for managing contemporary public finance systems. Among the specific topics considered in this course are the following: tax and nontax sources of revenue; intergovernmental fiscal relations; debt management; productivity; rate analysis; cash flow management; and managing fiscal retrenchment.

PA 590 - Human Resource Management in the Public Sector (3)

Administration and management of human resource systems in public sector and nonprofit organizations. Focus is on the underlying values of human resource management, related public policies, structural patterns, and the functional areas of HRM systems. Specific attention will be directed to the strategic roles of human resource management in day-to-day operations, merit system concepts and practices, position and wage classification systems, methods of securing a qualified labor force, and labor relations. Legal requirements in each of these areas will be examined. Emphasis will be on learning by doing through use of skill-building exercises, simulation and analysis of case materials, review of relevant case law, administrative rulemaking, and current literature. This course serves as a foundation for PA 591. Prerequisite: PA 511.
PA 591 - Employment Law and Policy (3)
This course delves into the legal environment and the range of laws that are associated with the employment process from recruiting through termination or retirement and its overall policy impact on the practice of human resource management (HRM). Such areas entail federal, state and local legislation as well as ordinances, statutes and Executive Orders that govern equal employment opportunity and the legal framework within which human resource management must operate. Also considered are the constitutionality of employment laws and how constitutional law is applied to certain groups that may render private sector employees somewhat distinct in some ways from those in the public sector, in this case, government or state actors (e.g., those who work on behalf of the government). This course is heavily focused on case law, case analyses and the impact of various court decisions over time on policy interpretations, HRM practices and charting the employment through termination processes. Expected preparation: PA 511 and PA 590.

PA 592 - Volunteerism and Volunteer Management (3)
Examines the historical, social, and cultural context of voluntarism in America as a way of understanding who volunteers and why, and what difference it makes in the lives of organizations and communities. The course includes skill development in the management and administration of volunteer programs in a nonprofit organizational context, including volunteer program planning, evaluation of volunteer programs, recruitment, training, and retention of volunteers.

PA 593 - Civil Rights for Public Managers (3)
Public service professionals deal with a variety of civil rights issues on a regular basis. They manage a diverse workforce with civil rights considerations central to effective human resource management. That diverse workforce serves increasingly diverse communities. Civil rights include race and ethnicity, but other issues and groups as well. This course considers the major issues of civil rights from a public law perspective with a concern for the challenges facing public managers.

PA 594 - Enhancing Diversity in the Workplace (3)
To examine the effects of diversity across organizations with particular emphasis on those within the public sector. Three aspects of diversity initiatives will be employed: valuing, enabling and managing diversity. A wide range of cultural and social diversity issues, to include but not limited to race, gender, age, nationality, class, language, sexual orientation and disability, will be discussed. Theories and practical tools will be explored and students will be given the opportunity to work on diversity issues by way of discussions, case studies and field assessments.

PA 595 - Public Sector Labor Relations (3)
The history and development of public sector labor relations in the United States. This course explores the impact of labor organizations on government activities and the role of public sector managers in responding to unions. The course provides both a historical context for labor relations and a set of precepts for working with labor organizations in public administration. From hospitals, to school districts, regional government, cities, counties, state agencies and even some large nonprofits, this course explores the importance of developing and maintaining a constructive working relationship with the labor organizations that represent the employees of those organizations.

PA 596 - Public Sector Collective Bargaining: Negotiations and Impasse Resolution (3)
Deals with the diversity of roles of the parties in negotiation; planning for negotiations; development of original demands and fallback positions; negotiation strategy and tactics; the major issues in negotiating; and the diversity and similarity of negotiations in state government, cities, counties, school districts, and higher education. A mock negotiation case will be bargained. This course will also deal with the process of mediation, fact-finding, and interest arbitration.
Prerequisite: PA 595.

PA 598 - Values-based Management I (3)
Introduces the model of values-based management as a method to enhance compatibility between the individual and the organization that is essential for decision-making and supervision, particularly in nonprofit organizations. Students will develop a theoretical understanding of the elements of effective supervision and of the impact that a director/ supervisor has on the human resource system in their organizations. Students will work through the process of clarifying agency mission, purpose, and values and develop skills for aligning their practices with these values.

PA 601 - Research (1-9)
(Credit to be arranged.)

PA 603 - Thesis (1 - 15)
(Credit to be arranged.)

PA 605 - Reading and Conference (1-9)
(Credit to be arranged.)

PA 607 - Seminar (1-9)
(Credit to be arranged.)

PA 609 - Practicum (1-9)
(Credit to be arranged.)

PA 610 - Selected Topics (1-9)
(Credit to be arranged.)

PA 699 - Special Studies (1-6)
(Credit to be arranged.)

PA 710 - Special Studies (1)
(Credit to be arranged.)

PE - Physical Education
PE 180 - Physical Education (0-1)
For detailed course descriptions please go to www.physed.pdx.edu.

PE 185 - Physical Education: Co-ed (1)
For detailed course descriptions please go to www.physed.pdx.edu.

PE 190 - Physical Education (0-1)
A variety of activities taught for physiological and recreational values.

PE 195 - Professional Activities (1)
Instruction and participation in skill progressions, teaching methods, rules interpretation, and performance evaluation for physical education majors.

PE 199 - Special Studies (1-6)
(Credit to be arranged.)
PE 280 - Physical Education Service Courses: Women (2)

A variety of activities taught for physiological and recreational values. Two hours per week plus field trips and extended experiences.

PE 285 - Physical Education Service Courses: Co-ed (2)

For detailed course descriptions please go to www.physed.pdx.edu. Two hours per week plus field trips and extended experiences.

PE 285L - Scuba Lab (0)

Scuba lab.

PE 299 - Special Studies (1-4)

(Credit to be arranged.)

Per - Persian

Per 101 - First-year Persian (4)

Introduction to spoken and written Persian. Grammar, reading, and simple conversation. This is the first course in a sequence of three: Per 101, Per 102, and Per 103.

Per 102 - First-year Persian (4)

Introduction to spoken and written Persian. Grammar, reading, and simple conversation. This is the second course in a sequence of three: Per 101, Per 102, and Per 103.

Per 103 - First-year Persian (4)

Introduction to spoken and written Persian. Grammar, reading, and simple conversation. This is the third course in a sequence of three: Per 101, Per 102, and Per 103.

Per 199 - Special Studies (1-6)

(Credit to be arranged.)

Per 201 - Second-year Persian (4)

Graded readings in the modern literary language. Conversation and prose composition. This is the first course in a sequence of three: Per 201, Per 202, and Per 203. Recommended prerequisite: Per 103.

Per 202 - Second-year Persian (4)

Graded readings in the modern literary language. Conversation and prose composition. This is the second course in a sequence of three: Per 201, Per 202, and Per 203. Recommended prerequisite: Per 103.

Per 203 - Second-year Persian (4)

Graded readings in the modern literary language. Conversation and prose composition. This is the third course in a sequence of three: Per 201, Per 202, and Per 203. Recommended prerequisite: Per 103.

Per 299 - Special Studies (1-12)

(Credit to be arranged.)

Per 301 - Third-year Persian (4)

Reading in literature, composition, expository writing, and conversation. This is the first course in a sequence of two: Per 301 and Per 302. Recommended prerequisite: Per 203.

Per 302 - Third-year Persian (4)

Reading in literature, composition, expository writing, and conversation. This is the second course in a sequence of two: Per 301 and Per 302. Recommended prerequisite: Per 203.

Per 330 - Persian Culture and Civilization (4)

A multimedia survey of major aspects of 2500 years of Persian civilization including traditions, art, music, architecture, handicrafts, literature, cities, and sports. Reflects Persian culture from the glories of Iran's past to contemporary scenes of rural life. Taught in English.

Per 330U - Persian Culture and Civilization (4)

A multimedia survey of major aspects of 2500 years of Persian civilization including traditions, art, music, architecture, handicrafts, literature, cities, and sports. Reflects Persian culture from the glories of Iran's past to contemporary scenes of rural life. Taught in English.

Per 341 - Introduction to Persian Literature (4)

Selected texts from classical and modern Persian poetry and prose including epic, lyric, and mystic traditions placed in historical contexts. Covers the most important genres such as the Qasida, the Ghazal, the Ruba'i and the Masnavi.

Prerequisite: Per 203.

Per 399 - Special Studies (1-4)

(Credit to be arranged.)

Per 401 - Research (1-6)

(Credit to be arranged.)

Per 404 - Cooperative Education/Internship (1-12)

(Credit to be arranged.)

Per 409 - Practicum (1-4)

(Credit to be arranged.)

Per 410 - Selected Topics (1-6)

(Credit to be arranged.)

PHE - Public Health Education

PHE 199 - Special Studies (1-4)

(Credit to be arranged.)

PHE 250 - Our Community: Our Health (4)

Examines social, behavioral, and environmental community health-related issues and the controversies that surround them. This course will be a recommended prerequisite for all upper-division classes in the major.

PHE 252 - First Aid (4)

Emergency care for various types of injuries: assessment, life threatening injuries, medical emergencies, and special situations. Additional training for childbirth and CPR for adult, infant, and child. Course leads to Red Cross certification.

PHE 270 - Basic Biomechanics (2)

Designed to introduce the anatomical and mechanical principles of kinesiology and biomechanics and their influences upon human movement/physical activity to include; Fundamental principles of the anatomy related to the musculoskeletal system to include; basic muscular structure, functional anatomy of joints and basic principles of physics.

PHE 275 - Stress Management (4)

An overview of the physiology of stress, stress triggers, assessment of stress, and stress management techniques and strategies.

PHE 295 - Health Promotion/Disease Prevention (4)

Examines scientific literature regarding lifestyle choices that promote optimal health and functioning. Behaviors regarding self-protection, self-care, and health promotion are compared to recommendations emerging from this literature.
PHE 299 - Special Studies (0-4)
(Credit to be arranged.)

PHE 314 - Research in Health and Fitness (4)
Examines basic aspects of scientific research related to health and fitness. Topics include: reading and critically evaluating scientific research reports; reviewing interpretation of basic statistical analyses; investigating the fundamental skills for developing a research plan, including problem selection, literature review, instrumentation, ethics and sampling.

PHE 325 - Nutrition for Health (4)
Examines basis for and quality of current nutritional requirements, standards, and guidelines. Studies evidence regarding current food fads and controversies. Analyzes personal dietary practices.

PHE 325U - Nutrition for Health (4)
Examines basis for and quality of current nutritional requirements, standards, and guidelines. Studies evidence regarding current food fads and controversies. Analyzes personal dietary practices.

PHE 326 - Drug Education (4)
Examines various approaches to drug education with an emphasis on prevention models. Epidemiology of and trends in drug use in the U.S. and effects on society. Reviews current and controversial issues and legal information on drug use effects.

PHE 326U - Drug Education (4)
Examines various approaches to drug education with an emphasis on prevention models. Epidemiology of and trends in drug use in the U.S. and effects on society. Reviews current and controversial issues and legal information on drug use effects.

PHE 327 - Community Nutrition (4)
This course provides students with an understanding of community nutrition as a career. Course topics include program planning, policies, resources, and issues specific to community nutrition.

PHE 327U - Community Nutrition (4)
This course provides students with an understanding of community nutrition as a career. Course topics include program planning, policies, resources, and issues specific to community nutrition.

PHE 328 - Health and Housing Across the Life Course (4)
Addresses social, cultural, and environmental forces on the relationships between health and housing throughout the life-course. Topics include health disparities in housing quality and type; interventions to improve housing and neighborhood health; and international models of housing. Public and private strategies to prevent or solve housing-related health problems will be emphasized.

PHE 328U - Health and Housing Across the Life Course (4)
Addresses social, cultural, and environmental forces on the relationships between health and housing throughout the life-course. Topics include health disparities in housing quality and type; interventions to improve housing and neighborhood health; and international models of housing. Public and private strategies to prevent or solve housing-related health problems will be emphasized.

PHE 335 - Human Sexuality (4)
A survey of the psychological, physiological, and behavioral aspects of human sexuality, with particular emphasis on the influence of popular culture on these dimensions.

PHE 335U - Human Sexuality (4)
A survey of the psychological, physiological, and behavioral aspects of human sexuality, with particular emphasis on the influence of popular culture on these dimensions.

PHE 340 - Motor Learning (4)
Introduction to the principles and practice of motor learning as applied to physical education, physical fitness and sports related activities. Examination of the fundamental process of learning and teaching human movement patterns. the learner, and the process of teaching movement skills.

PHE 351 - Film and Health (4)
Critically explores public health issues as they are portrayed in popular films and discusses the scientific, social, and political underpinnings of the public health issues portrayed in these movies. Covers diseases such as AIDS, hemorrhagic fever, MS, cancer, leukemia, and multiple chemical sensitivity from both biomedical and social perspectives. Guest speakers from the community will contribute to the discussion.

PHE 351U - Film and Health (4)
Critically explores public health issues as they are portrayed in popular films and discusses the scientific, social, and political underpinnings of the public health issues portrayed in these movies. Covers diseases such as AIDS, hemorrhagic fever, MS, cancer, leukemia, and multiple chemical sensitivity from both biomedical and social perspectives. Guest speakers from the community will contribute to the discussion.

PHE 354 - Social Gerontology (4)
Addresses the social and ethical issues, problems, policies, and programs that affect the quality of life for our rapidly aging population. The interdisciplinary field of gerontology offers students the opportunity to integrate biological, psychological, and social theories of aging. Also examines the economic and political impacts of an aging society.

PHE 354U - Social Gerontology (4)
Addresses the social and ethical issues, problems, policies, and programs that affect the quality of life for our rapidly aging population. The interdisciplinary field of gerontology offers students the opportunity to integrate biological, psychological, and social theories of aging. Also examines the economic and political impacts of an aging society.

PHE 355 - Consumer Health Issues (4)
Identifies and critically analyzes issues related to the production, marketing, and consumption of health-related goods and services. Media messages about consumer health issues are examined; topical and timely research is analyzed.

PHE 355U - Consumer Health Issues (4)
Identifies and critically analyzes issues related to the production, marketing, and consumption of health-related goods and services. Media messages about consumer health issues are examined; topical and timely research is analyzed.
PHE 361 - Care and Prevention of Injuries (4)
Introduction to the prevention, recognition, care, and rehabilitation of injuries resulting from participation in activity. Practical skills are demonstrated and practiced with emphasis on student participation. Recommended prerequisites: Bi 301, 302.

PHE 363 - Communicable Diseases and Chronic Health Problems (4)
Reviews etiology, epidemiology, and approaches to prevention of infectious and chronic diseases. Aspects of risk factors, transmission, pathogenesis, immunology, case management, and control programs are discussed. Basic human physiological processes are reviewed. Recommended prerequisites: Bi 301, 302, PHE 250.

PHE 365 - Health Promotion Programs for Children and Youth (4)
Provides an understanding of factors that influence health status and development of children and youth in the United States. Particular attention will be directed at health promotion programs for children, youth, and families in school and community settings. Includes a service component.

PHE 369 - Public Health Law, Policy, and Ethics (4)
This course will introduce the ways in which the public’s health is impacted by public policy, law and ethics through the examination of real-world case studies. What health protections are individuals and communities entitled to, who are the players who determine and enforce public health law and policy, and what are the implications of the conflicts of interest that arise?

PHE 370 - Applied Kinesiology (4)
Overview of anatomical and mechanical bases of human movement. Review of biomechanical principles with applications to exercise and health.
Prerequisite: PHE 270.

PHE 399 - Special Studies (1-6)
(Credit to be arranged.)

PHE 401 - Research (1-8)
(Credit to be arranged.) Consent of instructor.

PHE 402 - Independent Study (1-8)
(Credit to be arranged.)

PHE 404 - Cooperative Education/Internship (1-15)
(Credit to be arranged.) A work related experience designed to connect and integrate theory with specific activities in a "real" environment under supervision. Field hours for students taking the internship will be 30 hours per credit per term. Additionally, students will be expected to attend scheduled seminars.

PHE 405 - Reading and Conference (0-6)
(Credit to be arranged.) Consent of instructor.

PHE 406 - Special Projects (1-6)
(Credit to be arranged.)

PHE 407 - Seminar (1-9)
(Credit to be arranged.) Maximum: 9 credits.

PHE 408 - Workshop (0-15)
(Credit to be arranged.)

PHE 409 - Practicum (1-12)
(Credit to be arranged.)

PHE 410 - Selected Topics (1-8)
(Credit to be arranged.)

PHE 410U - Selected Topics (4)
(Credit to be arranged.)

PHE 416 - Families and Aging (4)
Family ties of middle aged and older adults are explored using a life course perspective. The diversity of family structure and experience is emphasized with attention to gender, race, class, and ethnicity. Life transitions are highlighted as are informal and formal services available to support older adults and their families. Also offered for graduate-level credit as PHE 516 and may be taken only once for credit.
Prerequisite: Upper-division standing.

PHE 417 - Adapted Physical Education (4)
Designed to give students a background in how to effectively teach physical activity to individuals with disabilities. Additionally, this course is constructed to facilitate the student’s understanding of the specific characteristics of exceptional individuals in order to realize their limitations, and especially to maximize their potential.
Prerequisite: Twelve hours of upper-division coursework in PHE.

PHE 421 - Health Coaching Strategies (4)
Concepts and techniques for work with individuals and groups on improving all areas of wellness including fitness, nutrition, weight, stress, and management of life issues that affect health. Program planning theories and models as well as practices for health education, including developing rapport, nonviolent communication, motivational interviewing and practice management. Students gain practical experience through live coaching demonstrations.
Prerequisite: Twelve hours of upper-division coursework in PHE.

PHE 423 - Business and Aging (4)
Economic and business implications of population aging, including an exploration of demographic changes, the economic reality faced by today's older adults in work and retirement, and older adults as consumers. Also offered for graduate-level credit as PHE 523 and may be taken only once for credit.
Prerequisite: Twelve hours of upper-division coursework in PHE.

PHE 424 - Business and Aging (4)
Economic and business implications of population aging, including an exploration of demographic changes, the economic reality faced by today's older adults in work and retirement, and older adults as consumers. Also offered for graduate-level credit as PHE 523 and may be taken only once for credit.
Prerequisite: Two semester in PHE.

PHE 427 - Life Skills (4)
Designed to enable the student to understand and evaluate complex environmental health issues induced by waste products generated by modern technology. Specific topics include water quality, air quality, solid and hazardous waste, occupational health, ionizing and nonionizing radiation, chemical contamination of foods, food additives, animal transmission of disease, noise, and selected current topics.

PHE 443 - Environmental Health (4)
Designed to enable the student to understand and evaluate complex environmental health issues induced by waste products generated by modern technology. Specific topics include water quality, air quality, solid and hazardous waste, occupational health, ionizing and nonionizing radiation, chemical contamination of foods, food additives, animal transmission of disease, noise, and selected current topics.

PHE 443U - Environmental Health (4)
Designed to enable the student to understand and evaluate complex environmental health issues induced by waste products generated by modern technology. Specific topics include water quality, air quality, solid and hazardous waste, occupational health, ionizing and nonionizing radiation, chemical contamination of foods, food additives, animal transmission of disease, noise, and selected current topics.
PHE 444 - Global Health (4)
Critically explores global public health issues as they pertain to different populations throughout the world, such as global disease eradication initiatives, environmental and infectious diseases from an international perspective, and discusses health needs of special populations.

PHE 444U - Global Health (4)
Critically explores global public health issues as they pertain to different populations throughout the world, such as global disease eradication initiatives, environmental and infectious diseases from an international perspective, and discusses health needs of special populations.

PHE 445 - Men's Health (4)
The focus of this course is current men's health issues. Students have opportunities to critically explore a broad array of men's health concerns across the life span from a multidisciplinary perspective. Men's health issues may include such topics as reproductive health, violence, aging, heart disease, depression, and sexuality. The class is taught in an interactive format through group discussion, presentations, and the participation of group speakers. The course focuses on the consideration and critique of current influences on men's health including the effect of the health care system, male socialization, the impact of the social and cultural factors, and the influence of evolving technology. Also offered for graduate-level credit as PHE 545 and may be taken only once for credit.

PHE 446 - Community Health Principles and Practices (4)
Provides an overview of the scope of problems in the field of community health. Examines disease prevention/control, community health service delivery, the structure of official/unofficial agencies, and policy/decision-making processes. Course includes field work in a community health agency.

PHE 446U - Community Health Principles and Practices (4)
Provides an overview of the scope of problems in the field of community health. Examines disease prevention/control, community health service delivery, the structure of official/unofficial agencies, and policy/decision-making processes. Course includes field work in a community health agency.

PHE 448 - Health Education Techniques and Strategies (4)
Introduces students to basic techniques and strategies used in planning and carrying out health education programs in a variety of settings. Special emphasis is given to scope and sequencing skills, objective writing, selection/development of health education resources/materials, and methods for and use of technology in the delivery of health education programs. Recommended prerequisite: PHE 350.

PHE 450 - Epidemiology (4)
Introduces principles and methods of epidemiological investigation of infectious/non-infectious diseases. Illustrates methods by which properly conducted studies of the distribution and dynamic behavior of disease in a population can contribute to understanding of etiologic factors, modes of transmission, and pathogenesis of disease. Recommended prerequisite: PHE 363.

PHE 451 - Women and Holistic Health (4)
Exploring the intersection of three fields -- allopathic medicine, women's health, and complementary therapies-- the course examines the emerging field of integrative medicine, highlighting the contributions that women care givers and healers have made to its development. An overview of common women's health concerns provides the opportunity to compare and contrast essential elements of holistic treatment approaches with those of allopathic medicine. Also offered for graduate-level credit as PHE 551 and may be taken only once for credit. Expected preparation: PHE 295 or WS 101.

PHE 452 - Gender, Race, Class and Health (4)
Emphasizes how the gender-, race-, and class-based organization of society affects the health of our communities. Covers an introduction and historical framework for social inequities in health; describes disparities in health by gender, race, and class; and explores the interplay between these major social forces and the biological mechanisms that influence the occurrence of disease.

PHE 452U - Gender, Race, Class and Health (4)
Emphasizes how the gender-, race-, and class-based organization of society affects the health of our communities. Covers an introduction and historical framework for social inequities in health; describes disparities in health by gender, race, and class; and explores the interplay between these major social forces and the biological mechanisms that influence the occurrence of disease.

PHE 453 - Women's Reproductive Health (4)
Critical review of current public health and socio-political issues in women's reproductive health. Both national and international topics are discussed. Students apply health knowledge in identifying and seeking solutions to the issues which concern health care providers, consumers, and policy makers. Also offered for graduate-level credit as PHE 553 and may be taken only once for credit. Expected preparation: PHE 250 and PHE 335.

PHE 455 - Health Aspects of Aging (4)
Examination of health-related changes that occur with aging. Review of current scientific literature with an investigation of physiological mechanisms responsible for changes in functional capacity throughout life. Explores the role of physical activity and nutrition in healthy aging. Also offered for graduate-level credit as PHE 555 and may be taken only once for credit. Expected preparation: PHE 295 or PHE 250, and Bi 302.

PHE 456 - Mind/Body Health: Disease Prevention (4)
An investigation of the integral relationship between body and mind and how that relationship manifests itself in health, illness, and promotes healing. Philosophical and scientific foundations of mind/body health are explored. Mind/body research and its application within allopathic medicine is examined as is research and practice in complementary fields of medicine and health care. Also offered for graduate-level credit as PHE 566 and may be taken only once for credit. Expected preparation: Psy 204, PHE 363.
PHE 467 - Mind/Body Health: Human Potential (4)

Theory and research in the human potential movement is integrated with research in mind/body medicine to produce an expanded understanding of human transformative capacities. Transformative practices including meditation, yoga, imagery, biofeedback, and sport are examined. Elements common to all transformative practices are identified. Also offered for graduate-level credit as PHE 567 and may be taken only once for credit. Expected preparation: PHE 466/566.

PHE 471 - Program Planning and Evaluation in Health Education: Theory and Skill Development (4)

Examines program planning models for health education. Includes needs assessment; program goals and objectives; program content and methodologies, evaluation, budgeting, and proposal writing. Students will gain practical experience in program planning and evaluation through community-based learning. Field work required. Recommended prerequisite: twelve hours of upper-division coursework in PHE.

PHE 472 - Marketing Public Health (4)

From behavior change to policy change, how do we make the healthy choice the easy choice? This course will explore the attitudes we bring to our public health work, and tools and strategies we can use to develop our effectiveness in improving health outcomes for individuals and society. Prerequisite: junior standing.

PHE 473 - Physiology of Exercise (4)

Examination of physiological responses and adaptations to exercise, with a focus on the interaction of metabolic, endocrine, neuromuscular, circulorespiratory, and environmental factors related to fitness and health. Also offered for graduate-level credit as PHE 573 and may be taken only once for credit. Prerequisite: Bi 301 or Bi 302 or equivalent, or consent of instructor.

PHE 473L - Physiology of Exercise Lab (0)

Physiology exercise lab.

PHE 474 - Exercise Prescription and Training (4)

Focuses on the basic principles and skills needed for developing and implementing physical fitness programs. Emphasis includes: appropriate/safe training procedures and the underlying principles which support such methods, applications to younger and older populations, gender differences, motivational strategies and health behavior theory, and exercise leadership skills. A significant portion of the course involves experiential learning. Recommended prerequisites: PHE 295, 473.

PHE 475 - Exercise Testing Techniques (4)

Theory and application of assessment methods/tools used to evaluate physiological function relating to fitness and health, including laboratory and field tests. Significant emphasis on developing skills necessary for conducting tests on apparently healthy individuals. Assessment categories include anaerobic performance, muscular strength and endurance, flexibility, body composition, cardiovascular function. Also offered for graduate-level credit as PHE 575 and may be taken only once for credit. Prerequisite: PHE 473, or consent of instructor.

PHE 475L - Exercise Testing Techniques Lab (0)

Exercise testing techniques lab.

PHE 478 - Program Planning and Evaluation: Needs Assessment and Interventions (4)

Examines program planning theories and models for health education. Includes needs assessment; program goals and objectives; interventions; program content and methodologies, measurement, and proposal writing. Students will gain practical experience in program planning through community-based learning. Field work required. This is the first course in a sequence of two: PHE 478 and PHE 479 and must be taken in sequence. Prerequisite: PHE 478.

PHE 479 - Program Planning and Evaluation in Health Education: Implementation and Evaluation (4)

Examines program planning theories and models for health education. Includes implementation strategies and evaluation approaches; resource allocation, budgeting, marketing, evaluation design, data analysis and reporting. Students will gain practical experience in program planning through community-based learning. Field work required. This is the second course in a sequence of two: PHE 478 and PHE 479 and must be taken in sequence.

PHE 480 - Controversial Issues in Community Health (4)

Examines controversial issues in the field of community health (e.g., violence, women’s health, medical technology, access to health services). Group presentations required. Recommended prerequisites: senior status and 12 credits of PHE.

PHE 491 - Research (1-6)

(Credit to be arranged.) Consent of instructor.

PHE 502 - Independent Study (1-8)

(Credit to be arranged.)

PHE 503 - Thesis (0-15)

(Credit to be arranged.)

PHE 504 - Cooperative Education/Internship (0-15)

(Credit to be arranged.)

PHE 505 - Reading and Conference (0-6)

(Credit to be arranged.) Consent of instructor.

PHE 506 - Special Projects (1-6)

(Credit to be arranged.)

PHE 507 - Seminar (1-9)

(Credit to be arranged.) Maximum: 9 credits.

PHE 508 - Workshop (0-15)

(Credit to be arranged.)

PHE 509 - Practicum (1-9)

(Credit to be arranged.)

PHE 510 - Selected Topics (1-8)

(Credit to be arranged.)

PHE 511 - Foundations of Public Health (3)

Provides students with an understanding of the field of public health. It provides knowledge about public health principles, concepts, values, tools, and applications. Key topics in the class include the mission of public health, the politics of public health,
determinants of health in the United States, major models and strategies for health promotion, and community perspectives on public health interventions.

**PHE 512 - Principles of Health Behavior I (3)**

Presents an overview of the biological, psychological, behavioral, sociocultural, and environmental factors that function in the promotion of health and prevention of disease. Theories developed to explain health and illness behaviors at intrapersonal, interpersonal, and group/community levels are introduced. Ethical issues involved in health-related behavior change are examined. Satisfies the core M.P.H. requirement. Recommended prerequisite: PHE 512.

**PHE 513 - Health, Behavior and the Social Environment (3)**

Surveys the social science research and theory concerning the social, economic, and cultural influences on health-related behavioral risk factors. Attention will be given to the divisions within society that affect the disease process, including the etiology and consequences of a wide range of adverse health outcomes. The central focus of each unit of study will be on the implications of a socio-ecology of health for community health practice and public health policy. Recommended prerequisite: PHE 512.

**PHE 514 - Physical Activity in Public Health (3)**

Overview of topics relevant to the study of physical activity in the United States. Topics: review of physiological alterations related to physical activity; historical background of physical activity recommendations; measurement issues; community-based approaches to increasing physical activity; school-based physical activity programs; older adults and special populations; work site and health care settings.

**PHE 515 - Introduction to Biostatistics (4)**

Quantitative analysis and interpretation of health data including data types, graphical and numerical description, probability distributions, association and correlation, estimation intervals, and statistical inference using both parametric and nonparametric methods, with applied exercises worked both by hand and using statistical software. Prerequisite: Graduate standing in the Oregon Master of Public Health programs.

**PHE 516 - Families and Aging (4)**

Family ties of middle aged and older adults are explored using a life course perspective. The diversity of family structure and experience is emphasized with attention to gender, race, class, and ethnicity. Life transitions are highlighted as are informal and formal services available to support older adults and their families. Also offered for undergraduate-level credit as PHE 416 and may be taken only once for credit. Prerequisite: junior standing.

**PHE 517 - Community Organizing (3)**

Emphasizes the role of community organizing to engage diverse communities to advance the conditions in which people can be healthy. It further examines the role of health educators, grassroots activists, and others in stimulating social, political, and economic approaches to promote community health. Also addresses the advancement of theoretical knowledge and practical skills of community organizing.

**PHE 518 - Topics in Health Studies (3)**

In-depth analysis of recent research and related program developments on one or more health-related topics. Topics vary according to term and instructor. Course may be taken more than once on different topics. Topics may include: mind/body health, nutrition, international health, environmental health, physical activity/exercise, and health of special populations. Recommended prerequisite: graduate standing.

**PHE 519 - Introduction to the Etiology of Disease (3)**

The biological and molecular bases of public health: the immune system, genomics, environmental exposures. The evidence-based role of biology in ecological models of population health, its integration in disease prevention and control policies and programs. Effects of behavior on biology. Legal, social, ethical issues will be considered.

**PHE 520 - Qualitative Research Design (3)**

Presents the philosophical and theoretical bases supporting the development of alternate research paradigms in human inquiry. Essential characteristics of three major alternate paradigms (interpretivist, constructivist, and critical theory) are introduced. Validity, reliability, and related concepts are examined from the perspective of each paradigm. Alternate strategies for inquiry are presented and ethical considerations related to qualitative forms of inquiry are addressed. Recommended prerequisite: graduate standing.

**PHE 521 - Quantitative Research Design and Analysis (3)**

Introduction to quantitative research design and statistical analysis. Emphasis on development of a research proposal. Topics include descriptive research, experimental and quasi-experimental research, univariate statistical procedures, and methods for planning and writing a research report. Prerequisite: PHE 530 and PHE 510, Introduction to Biostatistics or graduate equivalents.

**PHE 522 - Health and Social Inequalities (3)**

Introduction to historical and theoretical foundations for social epidemiology; investigates the conceptualization and measurement of different social determinants of health using a lifecourse approach; explores how the “embodiment” of social forces influence disease processes; and examines different actions (i.e., behavioral, clinical, social, legislative and political) used to eliminate health inequities within our local, national and international communities.

**PHE 523 - Business and Aging (4)**

Economic and business implications of population aging, including an exploration of demographic changes, the economic reality faced by today’s older adults in work and retirement, and older adults as consumers. Also offered for undergraduate-level credit as PHE 423 and may be taken only once for credit.

**PHE 527 - Food Systems and Public Health (3)**

Examines public health effects of industrial and alternative food systems. Designed as an introductory course for students interested in exploring issues at the intersections of public health, equity, and the environment. Key course themes include: food consumption patterns, health inequities,
food insecurity and hunger, healthy food environments, food animal production.

**PHE 530 - Epidemiology I (4)**

Designed as an introduction to epidemiology for students in the Oregon Masters of Public Health program. Epidemiology is the science of public health that is concerned with the distribution of disease in populations and risk factors that influence health outcomes. Students will learn epidemiologic methods to identify and solve public health problems. The course will cover measures of disease occurrence, screening for disease, study design, association and causation, biases and confounding, genetic epidemiology and ethics in epidemiology. An emphasis is placed upon both critical reading of the epidemiologic literature and to applying epidemiologic methods to address public health problems.

**PHE 531 - Women and Exercise: Physiological Aspects (3)**

Overview of physiological and health-related effects of exercise on women. Emphasis on the responses and adaptations to exercise specific to women. Topics include gender differences, the menstrual cycle, pregnancy, menopause, and osteoporosis. Recommended prerequisite: PHE 473/573.

**PHE 540 - Mass Communication and Health (3)**

Examine the use and effectiveness of mass media to both report the news about health and to promote changes of action in health-related areas. Students will be required to critique media health messages regarding their objectivity and the extent to which they are comprehensive.

**PHE 541 - Media Advocacy and Public Health (3)**

Provides students with an understanding of the role of media advocacy in advancing public health policies to promote health. The course uses lectures, group exercises, and case studies to illustrate basic concepts and skills related to media advocacy. Topics covered include: gaining access to the news, framing issues from a public health perspective, and the use of paid advertising to advance policy. Content areas include tobacco, violence, handguns, suicide, alcohol, and other public health issues.

**PHE 543 - Drugs, Behavior, and Society (3)**

Emphasis will be placed on the relationship between drug and alcohol use and a broad range of social circumstances associated with socio-economic status, race/ethnicity, and gender. Particular attention will be given to policy and service issues regarding the treatment and prevention of alcohol and drug abuse from a public health perspective. Recommended prerequisite: graduate standing.

**PHE 545 - Men’s Health (4)**

The focus of this course is current men’s health issues. Students have opportunities to critically explore a broad array of men’s health concerns across the life span from a multidisciplinary perspective. Men’s health issues may include such topics as reproductive health, violence, aging, heart disease, depression, and sexuality. The class is taught in an interactive format through group discussion, presentations, and the participation of group speakers. The course focuses on the consideration and critique of current influences on men’s health including the effect of the health care system, male socialization, the impact of the social and cultural factors, and the influence of evolving technology. Also offered for undergraduate-level credit as PHE 445 and may be taken only once for credit.

**PHE 546 - Urban and Community Health (3)**

Examines the social factors associated with urban health and quality of life, such as social class, gender inequalities, and racism. Emphasis will be placed upon community development and collective responses to the maintenance of health rather than upon individualized health promotion and disease prevention strategies.

**PHE 550 - Health Promotion Program Planning (4)**

Addresses practical applications of health promotion theories. Presents examples of planning, implementation, and evaluation of health promotion programs in a variety of settings as guides for the development of health promotion programs.

**PHE 551 - Women and Holistic Health (4)**

Exploring the intersection of three fields -- allopathic medicine, women’s health, and complementary therapies-- the course examines the emerging field of integrative medicine, highlighting the contributions that women care givers and healers have made to its development. An overview of common women’s health concerns provides the opportunity to compare and contrast essential elements of holistic treatment approaches with those of allopathic medicine. Also offered for undergraduate-level credit as PHE 451 and may be taken only once for credit. Expected preparation: PHE 295 or WS 101.

**PHE 552 - Women’s Health (3)**

Focuses on constructions of gender and sex and their implications for understanding determinants of population health, developing health promotion programs, and creating healthy public policy. Emphasizes the importance of the social, political, and economic context for women’s health. Topics include epidemiology of women’s health; diversity and health issues; reproductive health and sexuality; health care and access to health services; violence; mental health and emotional well-being; aging; lesbian health; and research in women’s health. Course learning will be synthesized through a community-based learning experience involving working with a community organization to evaluate women’s health needs in Portland.

**PHE 553 - Women’s Reproductive Health (4)**

Critical review of current public health and socio-political issues in women’s reproductive health. Both national and international topics are discussed. Students apply health knowledge in identifying and seeking solutions to the issues which concern health care providers, consumers, and policy makers. Also offered for undergraduate-level credit as PHE 453 and may be taken only once for credit. Expected preparation: PHE 250 and PHE 335.

**PHE 556 - Health Aspects of Aging (4)**

Examination of health-related changes that occur with aging. Review of current scientific literature with an investigation of physiological mechanisms responsible for changes in functional capacity throughout life. Explores the role of physical activity and nutrition in healthy aging. Also offered for undergraduate-level credit as PHE 456 and may be taken only once for credit. Expected preparation: PHE 295 or PHE 250, and Bi 302.
PHE 557 - National Long-term Care Policy (3)

This course examines the need for long-term care services and the risk factors associated with utilization of them as well as familiarizing students with the financing and delivery mechanisms in long-term care, both public and private. The policy issues in current long-term care initiatives are explored. Also offered as PHE 657 and may be taken only once for credit.

PHE 558 - Perspectives on Aging (3)

An introduction to the field of gerontology is presented from the perspectives offered by multiple disciplines, including sociology, psychology, biology, economics, political science, and demography. Stereotypes of aging and theoretical frameworks for understanding aging are examined, as are normal age-related changes, the impact of social, political, and economic conditions on the process of aging, and the myriad consequences of a growing population of elders. Also offered as PHE 658 and may be taken only once for credit.

PHE 559 - Economics of Aging (3)

Objectives are (1) understand the roots of income inequality between the aged and non-aged; (2) review the economic and policy factors that influence the decision to retire; (3) understand the political economy of old age income support in the U.S. and abroad; (4) explore the history, operation, and policy questions of our major public pension system, social security; and (5) discuss private pensions in relationship to U.S. income maintenance policy. Also offered as PHE 659 and may be taken only once for credit.

PHE 560 - Mental Health and Aging (3)

Focus on a psychological approach to mental health and aging. The physical and social environments of older people, as well as the individual's physical and psychological condition, strongly affect the mental health and quality of life of older people. It is the goal of the course to be useful to people who work with older adults and their families, or to people who want to understand changes that may be happening for older members of their own families. Guest speakers from the field of geriatric mental health will supplement the readings and course assignments. Also offered as PHE 660 and may be taken only once for credit.

PHE 561 - Cultural Variations in Aging (3)

The aging population includes an increasing percentage of people from a variety of ethnic groups. Although there may be cultural similarities between these groups and the dominant culture, there are also important differences, particularly in the role of the family in decision-making, attitudes and beliefs about illness, dying, and death. Students learn about cultural differences and similarities through observing programs that serve ethnic elders, talking with guest speakers who represent different ethnic communities, and reading several texts related to counseling, healthcare, and understanding grief, death, and dying in a variety of ethnic groups. Also offered as PHE 661 and may be taken only once for credit.

PHE 562 - Global Aging (3)

The rapid, unprecedented aging of the world's populations is resulting in myriad changes that will affect societies, cultures, economies, families, and individuals and their daily lives. Students will learn about broad global trends related to the aging of the world as well as aging in particular countries and regions.

PHE 563 - Service Learning in Nicaragua: Enhancing Communities for an Aging Society (3)

Rapid aging in Nicaragua's population will cause changes affecting individuals, families, communities, culture and economies. Students will attend class at PSU and travel to Nicaragua to learn about living conditions and support structures in place for older Nicaraguans and participate in service-learning projects to improve the lives of Nicaraguan elders.

Prerequisite: PHE 562 (co-enrollment in PHE 562 and PHE 563 is allowed).

PHE 566 - Mind/Body Health: Disease Prevention (4)

An investigation of the integral relationship between body and mind and how that relationship manifests itself in health, illness, and promotes healing. Philosophical and scientific foundations of mind/body health are explored. Mind/body research and its application within allopathic medicine is examined as is research and practice in complementary fields of medicine and health care. Also offered for undergraduate-level credit as PHE 466 and may be taken only once for credit. Expected preparation: Psy 204, PHE 363.

PHE 567 - Mind/Body Health: Human Potential (4)

Theory and research in the human potential movement is integrated with research in mind/body medicine to produce an expanded understanding of human transformative capacities. Transformative practices including meditation, yoga, imagery, biofeedback, and sport are examined. Elements common to all transformative practices are identified. Also offered for undergraduate-level credit as PHE 467 and may be taken only once for credit. Expected preparation: PHE 466/566.

PHE 573 - Physiology of Exercise (4)

Examination of physiological responses and adaptations to exercise, with a focus on the interaction of metabolic, endocrine, neuromuscular, circulatory, and environmental factors related to fitness and health. Also offered for undergraduate-level credit as PHE 473 and may be taken only once for credit.

Prerequisite: Bi 301 or Bi 302 or equivalent, or consent of instructor.

PHE 573L - Physiology of Exercise Lab (0)

Physiology exercise lab.

PHE 575 - Exercise Testing Techniques (4)

Theory and application of assessment methods/tools used to evaluate physiological function relating to fitness and health, including laboratory and field tests. Significant emphasis on developing skills necessary for conducting tests on apparently healthy individuals. Assessment categories include aerobic performance, muscular strength and endurance, flexibility, body composition, cardiovascular function. Also offered for undergraduate-level credit as PHE 475 and may be taken only once for credit.

Prerequisite: PHE 473, or consent of instructor.

PHE 575L - Exercise Testing Techniques Lab (0)

Exercise testing techniques lab.
PHE 576 - Physical Activity, Health, and Disease (3)
Review of current research to explore the relationships between physical activity/exercise and health/disease. Primarily investigates the role of physical activity in disease prevention, but also examines the impact of a variety of physical conditions (e.g., obesity, aging, etc.) on the potential for an active lifestyle. Topics include cardiovascular diseases, musculoskeletal disorders, respiratory conditions, metabolic diseases, cancers, and mental health. Recommended prerequisite: PHE 473.

PHE 577 - Exercise, Nutrition, and Performance (3)
Review of metabolic processes and physiological mechanisms involved in nutrient utilization in humans. Examination of the relationships between nutrition and health, with an emphasis on analysis of current research. Topics include carbohydrates, fats, protein, vitamins/minerals, fluids, weight control, and ergogenic aids. Analysis of nutritional modifications presumably related to exercise, health, and performance. Recommended prerequisites: PHE 473.

PHE 580 - Concepts of Environmental Health (3)
An intensive course designed to familiarize students with fundamentals of environmental health from a scientific and conceptual perspective. Topics are considered within multi-causal, ecological, adaptive systems, and risk-assessment frameworks. Includes consideration of biological, chemical, and physical agents in the environment which influence public health and well-being. Recommended prerequisite: graduate standing.

PHE 601 - Research (1-12)
(Credit to be arranged.)

PHE 602 - Independent Study (1-6)
(Credit to be arranged.)

PHE 605 - Reading and Conference (1-8)
(Credit to be arranged.)

PHE 606 - Special Projects (1-12)
(Credit to be arranged.)

PHE 607 - Seminar (1-9)
(Credit to be arranged.)

PHE 608 - Workshop (1-9)
(Credit to be arranged.)

PHE 609 - Practicum (1-9)
(Credit to be arranged.)

PHE 610 - Special Topics (1-9)
(Credit to be arranged.)

PHE 612 - Advanced Principles of Health Behavior (3)
Provides advanced training in the application of social and behavioral sciences to understand health behavior and prevent disease. Emphasizes theories and concepts of health behavior and the impact of lifestyle choices on the distribution of disease in the population.

PHE 622 - Health and Social Inequalities (3)
Introduction to historical and theoretical foundations for social epidemiology; investigates the conceptualization and measurement of different social determinants of health using a life course approach; explores how the "embodiment" of social forces influence disease processes; and examines different actions (i.e., behavioral, clinical, social, legislative and political) used to eliminate health inequities within our local, national and international communities.

PHE 623 - Doctoral Seminar in Health Research (1)
Research seminar required for first- and second-year doctoral students in the community health PhD program. Students learn about critical evaluation of health research, hypothesis generation, the publication and review process, grant application process, and development an independent research program.

PHE 624 - Advanced Methods in Epidemiologic Research I (3)
Approaches to epidemiologic research are explored, including the scientific method, ethics in research, theories, conceptual models and hypothesis generation, causal inference, the elements of research design, measurement (reliability, validity), developing data collection instruments, internal and external validity, and experimental methods.

PHE 625 - Advanced Methods in Epidemiologic Research II (3)
A second course in applied, non-experimental research designs used in epidemiological research (following PHE 624). Emphasis in this course is on quasi-experimental designs, program evaluation, sampling methods, longitudinal designs, and secondary data sources. Students will learn about research design, critical evaluation of research methods, and research proposal concepts. Recommended prerequisites: PHE 624 or consent of instructor.

PHE 626 - Teaching Health (1)
Students will learn about and practice teaching at the college level. Topics include course design, learning and teaching strategies, and assessment of student learning as applied within the public health curriculum. Pedagogical research and scholarship, as well as evidence-based practice are emphasized throughout the course. Recommended prerequisite: first-year doctoral student status in Community Health.

PHE 657 - National Long-term Care Policy (3)
This course examines the need for long-term care services and the risk factors associated with utilization of them as well as familiarizing students with the financing and delivery mechanisms in long-term care, both public and private. The policy issues in current long-term care initiatives are explored. Also offered as PHE 557 and may be taken only once for credit.

PHE 658 - Perspectives on Aging (3)
An introduction to the field of gerontology is presented from the perspectives offered by multiple disciplines, including sociology, psychology, biology, economics, political science, and demography. Stereotypes of aging and theoretical frameworks for understanding aging are examined, as are normal age-related changes, the impact of social, political, and economic conditions on the process of aging, and the myriad consequences of a growing population of elders. Also offered as PHE 558 and may be taken only once for credit.
PHE 659 - Economics of Aging (3)

Objectives are (1) understand the roots of income inequality between the aged and non-aged; (2) review the economic and policy factors that influence the decision to retire; (3) understand the political economy of old age income support in the U.S. and abroad; (4) explore the history, operation, and policy questions of our major public pension system, social security; and (5) discuss private pensions in relationship to U.S. income maintenance policy. Also offered as PHE 559 and may be taken only once for credit.

PHE 660 - Mental Health and Aging (3)

Focus on a psychological approach to mental health and aging. The physical and social environments of older people, as well as the individual's physical and psychological condition, strongly affect the mental health and quality of life of older people. It is the goal of the course to be useful to people who work with older adults and their families, or to people who want to understand the changes that may be happening for older members of their own families. Guest speakers from the field of geriatric mental health will supplement the readings and course assignments. Also offered as PHE 560 and may be taken only once for credit.

PHE 661 - Cultural Variations in Aging (3)

The aging population includes an increasing percentage of people from a variety of ethnic groups. Although there may be cultural similarities between these groups and the dominant culture, there are also important differences, particularly in the role of the family in decision-making, attitudes and beliefs about illness, dying, and death. Students learn about cultural differences and similarities through observing programs that serve ethnic elders, talking with guest speakers who represent different ethnic communities, and reading several texts related to counseling, healthcare, and understanding grief, death, and dying in a variety of ethnic groups. Also offered as PHE 561 and may be taken only once for credit.

PHE 699 - Special Studies (1-6)

(Credit to be arranged.)

Phi - Philosophy

Phi 199 - Special Studies (1-4)

(Credit to be arranged.)

Phi 201 - Introduction to Philosophy (4)

General introduction to philosophy. While different instructors will use different materials -- typically classical texts -- attention will be given to what makes a question a philosophical question and the nature and methods of philosophical inquiry.

Phi 210 - Philosophy of Religion (4)

Examination of philosophical questions involved in the study of religion, e.g., the meaning of "God," or "gods;" the traditional arguments for the existence of a god; the meaning of faith and the question of its connection to reason; the problem of evil (of reconciling a god's alleged perfection with the existence of evil). Note: this is not a class in comparative religion or the history of religion.

Phi 212 - Philosophy in Literature (4)

An introduction to traditional philosophical issues as they appear in literature, especially in fiction. The specific philosophical problems and the literary works will vary from term to term and from instructor to instructor.

Phi 300 - Philosophical Methods and Concepts (4)

A survey of the major strategies of proof and disproof central to philosophical reasoning, and of the fundamental concepts and distinctions employed in current philosophical discourse. Aims at providing students who have a serious interest in thinking philosophically with the conceptual tools found to be useful for this purpose. Not recommended as a first course in philosophy.

Phi 300U - Philosophical Methods and Concepts (4)

A survey of the major strategies of proof and disproof central to philosophical reasoning, and of the fundamental concepts and distinctions employed in current philosophical discourse. Aims at providing students who have a serious interest in thinking philosophically with the conceptual tools found to be useful for this purpose. Not recommended as a first course in philosophy.

Phi 301 - Ancient Philosophy (4)

Study of Ancient Greek philosophy with a primary focus on the philosophies of Plato and Aristotle. Key topics include form, matter, substance, and causation.

Phi 301U - Ancient Philosophy (4)

Study of Ancient Greek philosophy with a primary focus on the philosophies of Plato and Aristotle. Key topics include form, matter, substance, and causation.

Phi 302 - Medieval Philosophy (4)

Study of philosophy during the Medieval period. Topics include developments in logic, role of faith and reason in knowledge, and use of Platonic and Aristotelian philosophy. Course readings include Christian, Jewish, and Islamic authors.

Phi 302U - Medieval Philosophy (4)

Study of philosophy during the Medieval period. Topics include developments in logic, role of faith and reason in knowledge, and use of Platonic and Aristotelian philosophy. Course readings include Christian, Jewish, and Islamic authors.

Phi 303 - Early Modern Philosophy (4)

History of Western philosophy during the Early Modern period (17th and 18th centuries) from Descartes to Kant. Topics include nature of knowledge and reality; theories of human nature.

Phi 304 - Nineteenth Century Philosophy (4)

Study of continental European philosophy from Hegel to Nietzsche. Topics include post-Kantian idealism, the "social turn" in epistemology, communitarian ethics, reactions to the crisis in Christianity, and the radical critiques of modern social and political institutions.

Phi 304U - Nineteenth Century Philosophy (4)

Study of continental European philosophy from Hegel to Nietzsche. Topics include post-Kantian idealism, the "social turn" in epistemology, communitarian ethics, reactions to the crisis in Christianity, and the radical critiques of modern social and political institutions.

Phi 305 - Philosophy of Medicine (4)

Examination of central philosophical issues that arise within the theory and practice of
A survey of philosophical issues that arise within the theory and practice of medicine such as: the relationship of medicine to basic sciences, the roles played in medicine by normative concepts such as health and illness, the nature of causal reasoning in medicine, and the nature of diagnostic categories in medicine and psychiatry.

**Phl 305U - Philosophy of Medicine (4)**
Examination of central philosophical issues that arise within the theory and practice of medicine such as: the relationship of medicine to basic sciences, the roles played in medicine by normative concepts such as health and illness, the nature of causal reasoning in medicine, and the nature of diagnostic categories in medicine and psychiatry.

**Phl 306 - Science and Pseudoscience (4)**
An examination of basic issues in philosophy of science through an analysis of creation science, faith healing, UFO abduction stories, and other pseudosciences. Some of the questions addressed: What distinguishes science from pseudoscience? How are theories tested? When is evidence reliable? Must we invoke the supernatural to explain certain aspects of reality?

**Phl 306U - Science and Pseudoscience (4)**
An examination of basic issues in philosophy of science through an analysis of creation science, faith healing, UFO abduction stories, and other pseudosciences. Some of the questions addressed: What distinguishes science from pseudoscience? How are theories tested? When is evidence reliable? Must we invoke the supernatural to explain certain aspects of reality?

**Phl 307 - Introduction to the Philosophy of Social Science (4)**
A survey of philosophical issues that arise within social sciences: what is the object of study of the social sciences, are social sciences scientific, are there laws in social sciences, are social sciences descriptive or explanatory, and does the proper methodology of social sciences include unique hermeneutical principles of understanding or merely methods of causal inference and/or structural analysis?

**Phl 307U - Introduction to the Philosophy of Social Science (4)**
A survey of philosophical issues that arise within social sciences: what is the object of study of the social sciences, are social sciences scientific, are there laws in social sciences, are social sciences descriptive or explanatory, and does the proper methodology of social sciences include unique hermeneutical principles of understanding or merely methods of causal inference and/or structural analysis?

**Phl 308 - Elementary Ethics (4)**
General introduction to ethical theory. Attention will be given to such questions as whether there are objective moral distinctions, what makes right acts right and wrong acts wrong, and how we know (if we do) that actions are right or wrong. Among the theories to be considered are relativism, egoism, utilitarianism, and Kantianism.

**Phl 308U - Elementary Ethics (4)**
General introduction to ethical theory. Attention will be given to such questions as whether there are objective moral distinctions, what makes right acts right and wrong acts wrong, and how we know (if we do) that actions are right or wrong. Among the theories to be considered are relativism, egoism, utilitarianism, and Kantianism.

**Phl 309 - Business Ethics (4)**
Study of the ethical aspects of practices and organizational structures in the business world such as: the moral status of corporations; the concept of work place rights; responsibility in advertising; environmental constraints on business; affirmative action in hiring; the social roles of profit and private property; role of work in the life of the individual.

**Phl 309U - Business Ethics (4)**
Study of the ethical aspects of practices and organizational structures in the business world such as: the moral status of corporations; the concept of work place rights; responsibility in advertising; environmental constraints on business; affirmative action in hiring; the social roles of profit and private property; role of work in the life of the individual.

**Phl 310 - Environmental Ethics (4)**
Critical study of issues raised by the attempt to formulate an adequate environmental ethic. Some of these issues deal with how our treatment of the environment affects other human beings, i.e., future generations. Others have to do with how non-human beings are to be treated. Do animals have rights? Do species have rights? Do our proper moral concerns extend to such things as trees, rivers, and possibly the planet itself? A number of current problems will be considered, such as population control, limits to growth, global warming, and endangered species.

**Phl 310U - Environmental Ethics (4)**
Critical study of issues raised by the attempt to formulate an adequate environmental ethic. Some of these issues deal with how our treatment of the environment affects other human beings, i.e., future generations. Others have to do with how non-human beings are to be treated. Do animals have rights? Do species have rights? Do our proper moral concerns extend to such things as trees, rivers, and possibly the planet itself? A number of current problems will be considered, such as population control, limits to growth, global warming, and endangered species.

**Phl 311 - The Morality of Punishment (4)**
The focus is on the nature and proper aims of punishment; moral considerations that bear on the justice and wisdom of punishment. Consideration will be given to the main theories of punishment: retributionism, utilitarianism, paternalism, and the view that punishment should be replaced by therapy.

**Phl 311U - The Morality of Punishment (4)**
The focus is on the nature and proper aims of punishment; moral considerations that bear on the justice and wisdom of punishment. Consideration will be given to the main theories of punishment: retributionism, utilitarianism, paternalism, and the view that punishment should be replaced by therapy.

**Phl 312 - Feminist Philosophy (4)**
Critically examines traditional schools of philosophical thinking from a feminist perspective.

**Phl 312U - Feminist Philosophy (4)**
Critically examines traditional schools of philosophical thinking from a feminist perspective. Recommended prerequisite: one philosophy course other than Phl 306, 324.
Phl 313 - Life and Death Issues (4)
Study of moral problems dealing with life and death issues including abortion, euthanasia, the death penalty, starvation, and nuclear war.

Phl 313U - Life and Death Issues (4)
Study of moral problems dealing with life and death issues including abortion, euthanasia, the death penalty, starvation, and nuclear war.

Phl 314 - Computer Ethics (4)
Examines the moral principles and judgments relevant for computer-related practices. Topics include: ethical aspects of new information technologies; are technologies value-laden; potential abuses and their social consequences; freedom, privacy, and control; security, reliability, and professional responsibilities; risks, control, and regulations; piracy and ownership; ethics of hacking; ethics of virtual environment; and international aspects of new technologies.

Phl 314U - Computer Ethics (4)
Examines the moral principles and judgments relevant for computer-related practices. Topics include: ethical aspects of new information technologies; are technologies value-laden; potential abuses and their social consequences; freedom, privacy, and control; security, reliability, and professional responsibilities; risks, control, and regulations; piracy and ownership; ethics of hacking; ethics of virtual environment; and international aspects of new technologies.

Phl 315 - Existentialism (4)
Introduction to a number of philosophers and literary figures gathered together under the name “existentialism.” Authors include Dostoyevsky, Kierkegaard, Nietzsche, Rilke, Kafka, Ortega y Gasset, Jaspers, Heidegger, Sartre and Camus. Topics include consciousness, (in)authenticity, alienation, death, anxiety, freedom, time, nihilism, historical meaning and religion. Recommended: one philosophy course.

Phl 316 - Social and Political Philosophy (4)
The main philosophical theories of the nature and principles of a just society. Social and political order, freedom, justice, and happiness are declared to be the principal ends of any society. Philosophical theories describe, explore, explain, and frequently attempt to justify specific social or political arrangements in order to attain these goals.

Phl 316U - Social and Political Philosophy (4)
The main philosophical theories of the nature and principles of a just society. Social and political order, freedom, justice, and happiness are declared to be the principal ends of any society. Philosophical theories describe, explore, explain, and frequently attempt to justify specific social or political arrangements in order to attain these goals.

Phl 317 - Philosophy of Art (4)
Philosophical issues concerning the creation, interpretation, and consumption of art. Includes an overview of the major philosophical theories about the nature of art, an examination of the relationship between art and ethics, art and psychology, art and pornography, and relativism of aesthetic value judgments.

Phl 317U - Philosophy of Art (4)
Philosophical issues concerning the creation, interpretation, and consumption of art. Includes an overview of the major philosophical theories about the nature of art, an examination of the relationship between art and ethics, art and psychology, art and pornography, and relativism of aesthetic value judgments.

Phl 318 - Philosophy of Medicine (4)
Examination of central philosophical issues that arise within the theory and practice of medicine such as: the relationship of medicine to basic sciences, the roles played in medicine by normative concepts such as health and illness, the nature of causal reasoning in medicine, and the nature of diagnostic categories in medicine and psychiatry.

Phl 318U - Philosophy of Medicine (4)
Examination of central philosophical issues that arise within the theory and practice of medicine such as: the relationship of medicine to basic sciences, the roles played in medicine by normative concepts such as health and illness, the nature of causal reasoning in medicine, and the nature of diagnostic categories in medicine and psychiatry.

Phl 319 - Introduction to Asian Philosophy (4)
A study of different systems of eastern philosophy through the main classical texts drawn from Buddhism, Taoism, and Confucianism. Topics include: the nature of reality, the self, causality, language, knowledge, and ethics.

Phl 320 - Critical Thinking (4)
Designed to improve reasoning and skills of critical assessment of information. Focuses on practical methods that are applied to case studies from public media such as editorials, essays, propaganda advertisements, and newspaper reports of scientific studies.

Phl 320U - Critical Thinking (4)
Designed to improve reasoning and skills of critical assessment of information. Focuses on practical methods that are applied to case studies from public media such as editorials, essays, propaganda advertisements, and newspaper reports of scientific studies.

Phl 321 - Practical Epistemology (4)
Considers criteria for knowledge-claims based on different sources, such as: memory, perception, eyewitness testimony, expert testimony, and medical and scientific experts.

Phl 321U - Practical Epistemology (4)
Considers criteria for knowledge-claims based on different sources, such as: memory, perception, eyewitness testimony, expert testimony, and medical and scientific experts.

Phl 322 - Minds and Machines (4)
Study of philosophical aspects of artificial intelligence including its functionalist ontology. Topics include the nature of computation, learning, and intelligence and the role of consciousness in thinking and behavior. Expected preparation: 8 credits in any science or 8 credits in any philosophy courses.

Phl 322U - Minds and Machines (4)
Study of philosophical aspects of artificial intelligence including its functionalist ontology. Topics include the nature of computation, learning, and intelligence and the role of consciousness in thinking and
behavior. Expected preparation: 8 credits in any science or 8 credits in any philosophy courses.

**Phil 324 - Introduction to Formal Logic I (4)**

A course in basic formal logic. Major topics include the method of deduction for showing propositional arguments valid and the method of counter-example for showing such arguments invalid. Truth table methods, tests for consistency, and syllogistic arguments are optional topics.

**Phil 324U - Introduction to Formal Logic I (4)**

A course in basic formal logic. Major topics include the method of deduction for showing propositional arguments valid and the method of counter-example for showing such arguments invalid. Truth table methods, tests for consistency, and syllogistic arguments are optional topics.

**Phil 325 - Introduction to Formal Logic II, Predicate Logic (4)**

Continuation of Phil 324 Introduction to Formal Logic. Primary emphasis will be on formal methods for dealing with arguments involving the terms "all" and "some." Major topics include the method of deduction for showing predicate logic arguments valid, and the method of counter-example for showing such arguments invalid.

**Phil 325U - Introduction to Formal Logic II, Predicate Logic (4)**

Continuation of Phil 324 Introduction to Formal Logic. Primary emphasis will be on formal methods for dealing with arguments involving the terms "all" and "some." Major topics include the method of deduction for showing predicate logic arguments valid, and the method of counter-example for showing such arguments invalid. Recommended prerequisite: Phil 324.

**Phil 327 - Introduction to Quantitative Literacy (4)**

The goal is to learn to think intelligently and critically about important uses of quantitative data by means of discussion of the following topics: samples, measures, scales, relationships, risks, predictions, graphs, averages, percentages, distributions, random effects, and estimates. Intended for students who do not normally take classes that involve quantitative matters; its mathematical content is kept at an absolute minimum.

**Phil 330 - Language, Representation, and Reality (4)**

An introduction to theories of meaning and their central topics: nature of representation and the referential capacity of language, role of use in meaning, and the role of language in thought and experience.

**Phil 330U - Language, Representation, and Reality (4)**

An introduction to theories of meaning and their central topics: nature of representation and the referential capacity of language, role of use in meaning, and the role of language in thought and experience.

**Phil 331 - Philosophy of Education (4)**

Exploration of the nature, aims, and value of education by situating it in its historical and contemporary philosophical context and perspectives. Expected preparation: at least one course in philosophy and/or education.

**Phil 331U - Philosophy of Education (4)**

Exploration of the nature, aims, and value of education by situating it in its historical and contemporary philosophical context and perspectives. Expected preparation: at least one course in philosophy and/or education.

**Phil 332 - Intentionality, Phenomenology, and Existentialism (4)**

Examination of the Kantian roots of what becomes known as "intentionality" (i.e., that our conscious acts are directed toward objects, intending them) and subsequent theories of intentionality (e.g., Husserl, Heidegger, Frege, and Searle). Recommended prerequisite: 8 credits in philosophy.

**Phil 333 - Philosophy of Law (4)**

Examines the nature of law, legal obligation and legal interpretation. Is law a part of morality, or nothing more than an expression of social power? When are we permitted or required to disobey the law? What is the proper methodology for interpreting laws and deciding cases? Do judges discover or create law? Readings include classics of jurisprudence (e.g., Austin, Hart, Dworkin) as well as judicial opinions in a selected topic. Recommended prerequisites: Phil 308, 311 or 316.

**Phil 344 - Military Ethics (4)**

Examination of the central conceptual, ethical, and existential issues concerning war and the military as an institution and a culture. Topics include theories of war, military values, and the ethics of technology (UAVs, WMDs), insurgency, and terrorism.

**Phil 344U - Military Ethics (4)**

Examination of the central conceptual, ethical, and existential issues concerning war and the military as an institution and a culture. Topics include theories of war, military values, and the ethics of technology (UAVs, WMDs), insurgency, and terrorism.

**Phil 350 - International Ethics (4)**

Introduction to central moral principles relevant for international relations. Topics include military, humanitarian, and covert intervention, economic sanctions, development assistance and human rights.

**Phil 350U - International Ethics (4)**

Introduction to central moral principles relevant for international relations. Topics include military, humanitarian, and covert intervention, economic sanctions, development assistance and human rights.

**Phil 351 - Philosophy of International Human Rights (4)**

Examination of concepts of human rights through classics of political philosophy, international human rights law and its development, and current high-profile cases of alleged violations of human rights.

**Phil 351U - Philosophy of International Human Rights (4)**

Examination of concepts of human rights through classics of political philosophy, international human rights law and its development, and current high-profile cases of alleged violations of human rights.
Phi 352 - Philosophy of International Law (4)
Analysis of International Law through its philosophical foundations, major historical forms of implementation, and current roles in ameliorating global problems (e.g., war, poverty, and revolutions).

Phi 352U - Philosophy of International Law (4)
Analysis of International Law through its philosophical foundations, major historical forms of implementation, and current roles in ameliorating global problems (e.g., war, poverty, and revolutions).

Phi 355 - Morality and Health Care (4)
Examination of central issues of the ethics of health care such as euthanasia, abortion and equitable medical allocation.

Phi 355U - Morality and Health Care (4)
Examination of central issues of the ethics of health care such as euthanasia, abortion and equitable medical allocation.

Phi 360 - American Philosophy (4)
Study of American pragmatism through some of its major representatives (e.g., Dewey, Peirce, James, and Mead), its intellectual and cultural context, and its influences on contemporary American philosophers.

Phi 360U - American Philosophy (4)
Study of American pragmatism through some of its major representatives (e.g., Dewey, Peirce, James, and Mead), its intellectual and cultural context, and its influences on contemporary American philosophers.

Phi 365 - Atheism (4)
Examination of atheist philosophy including secularism in ethics and politics, naturalism in epistemology and metaphysics, and contemporary naturalistic accounts of religion and faith-based beliefs.

Phi 365U - Atheism (4)
Examination of atheist philosophy including secularism in ethics and politics, naturalism in epistemology and metaphysics, and contemporary naturalistic accounts of religion and faith-based beliefs.

Phi 367 - Philosophy of Sport (4)
An examination of the central conceptual, ethical, and existential issues concerning sports. Topics include the nature and role of sports in human flourishing, theories of embodiment, and the morality of sports as an institution and culture including competition and violence.

Phi 367U - Philosophy of Sport (4)
An examination of the central conceptual, ethical, and existential issues concerning sports. Topics include the nature and role of sports in human flourishing, theories of embodiment, and the morality of sports as an institution and culture including competition and violence.

Phi 369 - Philosophy of Sex and Love (4)
An examination of the central philosophical issues emerging from a reflection on sex and love such as: possible essence of heterosexuality, homosexuality, and asexuality; morality of different expressions of sex and love such as sadomasochism and polygamy; role of sexuality and romantic love in our self-conception; influence of conceptual sources on our experiences of sexuality and love.

Phi 369U - Philosophy of Sex and Love (4)
An examination of the central philosophical issues emerging from a reflection on sex and love such as: possible essence of heterosexuality, homosexuality, and asexuality; morality of different expressions of sex and love such as sadomasochism and polygamy; role of sexuality and romantic love in our self-conception; influence of conceptual sources on our experiences of sexuality and love.

Phi 370 - Philosophy of Work and Leisure (4)
Role and nature of work and leisure in theories of the good life and central social and political practices.

Phi 370U - Philosophy of Work and Leisure (4)
Role and nature of work and leisure in theories of the good life and central social and political practices.

Phi 371 - Philosophy and the City (4)
Explores the role and nature of the city in the history of philosophy and especially social and political theory and the philosophical bases of contemporary urban theory including political, civic, sustainable, and aesthetic ideas of the city.

Phi 371U - Philosophy and the City (4)
Explores the role and nature of the city in the history of philosophy and especially social and political theory and the philosophical bases of contemporary urban theory including political, civic, sustainable, and aesthetic ideas of the city.

Phi 375 - Food Ethics (4)
An introduction to ethical issues surrounding food choices including the fairness of food markets, the moral status of animals, and our obligations to the hungry.

Phi 375U - Food Ethics (4)
An introduction to ethical issues surrounding food choices including the fairness of food markets, the moral status of animals, and our obligations to the hungry.

Phi 399 - Special Studies (1-6)
(Credit to be arranged.)

Phi 401 - Research (1-6)
(Credit to be arranged.) Consent of instructor.

Phi 402 - Independent Study (1-12)
(Credit to be arranged.)

Phi 403 - Honors Thesis (1-4)
(Credit to be arranged.) Consent of instructor.

Phi 404 - Cooperative Education/Internship (1-12)
(Credit to be arranged.)

Phi 405 - Reading and Conference (1-6)
(Credit to be arranged.) Consent of instructor.

Phi 406 - Projects (1-12)
(Credit to be arranged.)

Phi 407 - Seminar (1-6)
(Credit to be arranged.) Consent of instructor.

Phi 409 - Practicum (1-12)
(Credit to be arranged.)

Phi 410 - Selected Topics (1-6)
(Credit to be arranged.)
Phl 414 - Plato (4)
Study of selected dialogues of Plato with attention to such topics as his theory of forms, moral philosophy, political philosophy, and to the individual topics of the dialogues, as, for example, knowledge, being, virtue, piety, love, friendship, the state, the nature of philosophy. Also offered for graduate-level credit as Phl 514 and may be taken only once for credit. Recommended prerequisite: 8 credits in philosophy.

Phl 415 - Aristotle (4)
Study of some of the works of Aristotle, such as his Physics, Metaphysics, Ethics, Politics, parts of the Organon Rhetoric. Among topics for attention are substance, essence, categories, cause, the good man, practical reason. Also offered for graduate-level credit as Phl 515 and may be taken only once for credit. Recommended prerequisite: 8 credits in philosophy.

Phl 416 - The Rationalists: Descartes, Leibniz, Spinoza (4)
Study, with comparisons, of selected works of philosophers who maintained that knowledge comes primarily from reason. Likely readings: for Descartes, Meditations, or Rules, or Discourse on Method; for Spinoza, Ethics; for Leibniz, a selection from among his many collected works and fragments. Also offered for graduate-level credit as Phl 516 and may be taken only once for credit. Recommended prerequisite: 8 credits in philosophy.

Phl 417 - The Empiricists (4)
Study of the British philosophers, Locke, Berkeley and Hume, who hold that all of the ingredients of thought enter the mind by way of experience and that only what has a definite relation to experience can be thought. Among the particular topics considered will be material substance, spirit, abstract ideas, causation, induction, and skepticism. Also offered for graduate-level credit as Phl 517 and may be taken only once for credit. Recommended prerequisite: 8 credits in philosophy.

Phl 419 - Kant (4)
Study of Kant's Philosophy primarily as represented in the Critiques of Pure Reason, Practical Reason, Judgment. Readings from some of these or related works. Possible topics for consideration: necessary connection, the analytic-synthetic distinction, conceptions of science and metaphysics, relation between metaphysics and morality. Also offered for graduate-level credit as Phl 519 and may be taken only once for credit. Recommended prerequisite: 8 credits in philosophy.

Phl 420 - Wittgenstein (4)
Study of some of the major works of Wittgenstein with emphasis on the later work, especially the Philosophical Investigations. Attention will be given to Wittgenstein's contributions to philosophical method, as well as to his treatment of issues concerning language, meaning, intention, understanding, necessity, and the nature of human persons as language users. Also offered for graduate-level credit as Phl 520 and may be taken only once for credit. Recommended prerequisite: 12 credits in philosophy.

Phl 423 - Metaphysics (4)
Philosophical examination of traditional metaphysical issues (such as relation of body and mind, free will and determinism) and of the more influential ontologies (idealism, materialism, dualism). Introduction also to contemporary controversies over the feasibility of metaphysics as a rational discipline (logical positivism and its critics). Also offered for graduate-level credit as Phl 523 and may be taken only once for credit. Recommended prerequisite: 8 credits in philosophy.

Phl 424 - Epistemology (4)
Philosophical examination of some of the main issues in the theory of knowledge (such as our knowledge of the external world, of the minds of others, of logical and mathematical truths, etc.). Also offered for graduate-level credit as Phl 524 and may be taken only once for credit. Recommended prerequisite: 8 credits in philosophy.

Phl 432 - Philosophy of Mind (4)
Study of the debates over the nature of mental states and our knowledge of them. Main topics are dualism and various forms of physicalism, behaviorism, mind-body identity theories, functionalism and eliminativism. Also offered for graduate-level credit as Phl 532 and may be taken only once for credit. Expected preparation: 8 credits in philosophy.

Phl 433 - Philosophy of Language (4)
A study of the nature of language, and of problems of meaning, reference, and truth. Also offered for graduate-level credit as Phl 533 and may be taken only once for credit. Recommended prerequisite: 8 credits in philosophy.

Phl 445 - Advanced Ethics (4)
A course in moral epistemology or "meta-ethics" dealing with such matters as the distinction and connections between fact and value, "is" and "ought," and description and evaluation. Also offered for graduate-level credit as Phl 545 and may be taken only once for credit. Recommended prerequisite: 8 credits in philosophy.

Phl 446 - Topics in Ethics (4)
Topics in contemporary moral philosophy, including (but not limited to) the relation between applied and theoretical ethics, the foundations of moral responsibility, virtues, and the role of outcomes in moral evaluation. Course may be repeated for credit toward major requirements with departmental approval. Also offered for graduate-level credit as Phl 546 and may be taken only once for credit. Expected preparation: Phl 308 or Phl 445.

Phl 447 - Topics in Social and Political Philosophy (4)
An in-depth study of an important current issue (such as global justice, multiculturalism, or power) or figure (such as John Rawls, Jürgen Habermas, or Michel Foucault) in social and political philosophy. Course may be repeated for credit if topics are different. Also offered for graduate-level credit as Phl 547 and may be taken only once for credit.

Prerequisite: Phl 316 or junior-level standing or by instructor approval.

Phl 449 - Philosophy of Sustainability (4)
Examination of the core philosophical issues that arise within the theory and practice of sustainability and across its three complementary dimensions: environmental, economic, and social. Also offered for graduate-level credit as Phl 549 and may be taken only once for credit.

Prerequisite: junior standing.
Phil 451 - Classical Figures (4)

Intensive study of some classical figures such as Descartes, Spinoza, Leibniz, Nietzsche, Hegel. Course may be repeated for credit. Also offered for graduate-level credit as Phil 551 and may be taken only once for credit. Recommended: junior level standing.

Phil 460 - Contemporary European Philosophy (4)

In-depth study of a current theme (such as phenomenology, post-modernism, or post-structuralism) or topical figure (such as Habermas, Derrida, or Benjamin) of European, "Continental" Philosophy. Also offered for graduate-level credit as Phil 560 and may be taken only once for credit.

Prerequisite: Junior standing or consent of instructor.

Phil 470 - Philosophy of Science (4)

History and philosophy of the scientific method. Topics include an overview of the major models of the scientific method (inductivism, falsificationism, Kuhnian paradigms, etc.) and issues pertaining to the accuracy of these models and their rationality such as theory-ladenness of observation, testing-holism, and the incommensurability of theory change. Also offered for graduate-level credit as Phil 570 and may be taken only once for credit.

Recommended prerequisites: 8 credits in philosophy and upper-division standing.

Phil 471 - Topics in Philosophy of Science (4)

An in-depth analysis of some specific metaphysical issue pertaining to scientific epistemology such as (but not limited to) explanation, causation, realism, geometry, and relativism. Topics vary per course which will allow students to take course more than once, with departmental approval, to apply toward major requirements. Also offered for graduate-level credit as Phil 571 and may be taken only once for credit. Recommended prerequisites: 8 credits in philosophy and upper-division standing.

Phil 474 - Philosophy of Logic (4)

Topics: validity, sentence-proposition, connectives, quantifiers, truth, paradoxes, logical necessity and possibility. Optional topics: metalogic, the construction of formal systems of logic and formal proofs of certain of their properties, e.g., consistency and completeness. Also offered for graduate-level credit as Phil 574 and may be taken only once for credit. Recommended prerequisite: Phil 325.

Phil 481 - Biomedical Ethics (4)

A three-term sequence that provides a practical bioethics education in clinical health care, biomedical and behavioral research, and public policy. Phil 481/581: introduction to the concepts, methods, and literature of health care and biomedical research ethics, designed to familiarize participants with the basic definitions and arguments in the major topics of clinical and research ethics. Phil 482/582 and Phil 483/583: concepts and skills developed in 481/581 will be intensively examined; students take responsibility for several aspects of teaching. This is the first course in a sequence of three: Phil 481, Phil 482, and Phil 483 which must be taken in sequence. Also offered for graduate-level credit as Phil 581 and may be taken only once for credit. Recommended prerequisite: an acquaintance with health care services.

Phil 482 - Biomedical Ethics (4)

A three-term sequence that provides a practical bioethics education in clinical health care, biomedical and behavioral research, and public policy. Phil 481/581: introduction to the concepts, methods, and literature of health care and biomedical research ethics, designed to familiarize participants with the basic definitions and arguments in the major topics of clinical and research ethics. Phil 482/582 and Phil 483/583: concepts and skills developed in 481/581 will be intensively examined; students take responsibility for several aspects of teaching. This is the second course in a sequence of three: Phil 481, Phil 482, and Phil 483 which must be taken in sequence. Also offered for graduate-level credit as Phil 582 and may be taken only once for credit. Recommended prerequisite: an acquaintance with health care services.

Phil 483 - Biomedical Ethics (4)

A three-term sequence that provides a practical bioethics education in clinical health care, biomedical and behavioral research, and public policy. Phil 481/581: introduction to the concepts, methods, and literature of health care and biomedical research ethics, designed to familiarize participants with the basic definitions and arguments in the major topics of clinical and research ethics. Phil 482/582 and Phil 483/583: concepts and skills developed in 481/581 will be intensively examined; students take responsibility for several aspects of teaching. This is the third course in a sequence of three: Phil 481, Phil 482, and Phil 483 which must be taken in sequence. Also offered for graduate-level credit as Phil 583 and may be taken only once for credit. Recommended prerequisite: an acquaintance with health care services.

Phil 485 - Honors Seminar (4)

Selected topics within areas of the instructor's research. Students will be expected to produce substantial written material on the topic, to be shared and critiqued. Recommended particularly for students considering graduate work in philosophy. Recommended prerequisites: 20 credits in philosophy with a GPA in philosophy courses of at least 3.5.

Phil 501 - Research (1-9)

(Credit to be arranged.)

Phil 504 - Cooperative Education/Internship (0-12)

(Credit to be arranged.)

Phil 505 - Reading and Conference (0-6)

(Credit to be arranged.) Consent of instructor.

Phil 507 - Seminar (1-6)

(Credit to be arranged.) Consent of instructor.

Phil 510 - Selected Topics (1-6)

(Credit to be arranged.)

Phil 514 - Plato (4)

Study of selected dialogues of Plato with attention to such topics as his theory of forms, moral philosophy, political philosophy, and to the individual topics of the dialogues, as, for example, knowledge, being, virtue, piety, love, friendship, the state, the nature of philosophy. Also offered for undergraduate-level credit as Phil 414 and may be taken only once for credit. Recommended prerequisite: 8 credits in philosophy.

Phil 515 - Aristotle (4)

Study of some of the works of Aristotle, such as his Physics, Metaphysics, Ethics, Politics, parts of the Organon Rhetoric. Among topics
for attention are substance, essence, categories, cause, the good man, practical reason. Also offered for undergraduate-level credit as Phl 415 and may be taken only once for credit. Recommended prerequisite: 8 credits in philosophy.

**Phl 516 - The Rationalists: Descartes, Leibniz, Spinoza (4)**

Study, with comparisons, of selected works of philosophers who maintained that knowledge comes primarily from reason. Likely readings: for Descartes, Meditations, or Rules, or Discourse on Method; for Spinoza, Ethics; for Leibniz, a selection from among his many collected works and fragments. Also offered for undergraduate-level credit as Phl 416 and may be taken only once for credit. Recommended prerequisite: 8 credits in philosophy.

**Phl 517 - The Empiricists (4)**

Study of the British philosophers, Locke, Berkeley and Hume, who hold that all of the ingredients of thought enter the mind by way of experience and that only what has a definite relation to experience can be thought. Among the particular topics considered will be material substance, spirit, abstract ideas, causation, induction, and skepticism. Also offered for undergraduate-level credit as Phl 417 and may be taken only once for credit. Recommended prerequisite: 8 credits in philosophy.

**Phl 519 - Kant (4)**

Study of Kant’s Philosophy of Pure Reason, Practical Reason, Judgment. Readings from some of these or related works. Possible topics for consideration: necessary connection, the analytic-synthetic distinction, conceptions of science and metaphysics, relation between metaphysics and morality. Also offered for undergraduate-level credit as Phl 419 and may be taken only once for credit. Recommended prerequisite: 8 credits in philosophy.

**Phl 520 - Wittgenstein (4)**

Study of some of the major works of Wittgenstein with emphasis on the later work, especially the Philosophical Investigations. Attention will be given to Wittgenstein’s contributions to philosophical method, as well as to his treatment of issues concerning language, meaning, intention, understanding, necessity, and the nature of human persons as language users. Also offered for undergraduate-level credit as Phl 420 and may be taken only once for credit. Recommended prerequisite: 12 credits in philosophy.

**Phl 523 - Metaphysics (4)**

Philosophical examination of traditional metaphysical issues (such as relation of body and mind, free will and determinism) and of the more influential ontologies (idealism, materialism, dualism). Introduction also to contemporary controversies over the feasibility of metaphysics as a rational discipline (logical positivism and its critics). Also offered for undergraduate-level credit as Phl 423 and may be taken only once for credit. Recommended prerequisite: 8 credits in philosophy.

**Phl 524 - Epistemology (4)**

Philosophical examination of some of the main issues in the theory of knowledge (such as our knowledge of the external world, of the minds of others, of logical and mathematical truths, etc.). Also offered for undergraduate-level credit as Phl 424 and may be taken only once for credit. Recommended prerequisite: 8 credits in philosophy.

**Phl 532 - Philosophy of Mind (4)**

Study of the debates over the nature of mental states and our knowledge of them. Main topics are dualism and various forms of physicalism, behaviorism, mind-body identity theories, functionalism and eliminativism. Also offered for undergraduate-level credit as Phl 432 and may be taken only once for credit. Expected preparation: 8 credits in philosophy.

**Phl 533 - Philosophy of Language (4)**

A study of the nature of language, and of problems of meaning, reference, and truth. Also offered for undergraduate-level credit as Phl 433 and may be taken only once for credit. Recommended prerequisite: 8 credits in philosophy.

**Phl 545 - Advanced Ethics (4)**

A course in moral epistemology or “meta-ethics” dealing with such matters as the distinction and connections between fact and value, “is” and “ought,” and description and evaluation. Also offered for undergraduate-level credit as Phl 445 and may be taken only once for credit. Recommended prerequisite: 8 credits in philosophy.

**Phl 546 - Topics in Ethics (4)**

Topics in contemporary moral philosophy, including (but not limited to) the relation between applied and theoretical ethics, the foundations of moral responsibility, virtues, and the role of outcomes in moral evaluation. Course may be repeated for credit toward major requirements with departmental approval. Also offered for undergraduate-level credit as Phl 446 and may be taken only once for credit. Expected preparation: Phl 308 or Phl 445.

**Phl 547 - Topics in Social and Political Philosophy (4)**

An in-depth study of an important current issue (such as global justice, multiculturalism, or power) or figure (such as John Rawls, Jürgen Habermas, or Michel Foucault) in social and political philosophy. Course may be repeated for credit if topics are different. Also offered for undergraduate-level credit as Phl 447 and may be taken only once for credit. Prerequisite: Phl 316 or junior-level standing or by instructor approval.

**Phl 549 - Philosophy of Sustainability (4)**

Examination of the core philosophical issues that arise within the theory and practice of sustainability and across its three complementary dimensions: environmental, economic, and social. Also offered for undergraduate-level credit as Phl 449 and may be taken only once for credit. Prerequisite: junior standing.

**Phl 551 - Classical Figures (4)**

Intensive study of some classical figures such as Descartes, Spinoza, Leibniz, Nietzsche, Hegel. Course may be repeated for credit. Also offered for undergraduate-level credit as Phl 451 and may be taken only once for credit. Recommended: junior level standing.

**Phl 555 - Morality and Health Care (4)**

Examination of issues in health care such as euthanasia, abortion, allocation of transplantable organs, rationing health care, treatment of impaired newborns. Recommended prerequisite: 8 credits in philosophy.
Phi 560 - Contemporary European Philosophy (4)

In-depth study of a current theme (such as phenomenology, post-modernism, or post-structuralism) or topical figure (such as Habermas, Derrida, or Benjamin) of European, "Continental" Philosophy. Also offered for undergraduate-level credit as Phl 460 and may be taken only once for credit.

Prerequisite: Junior standing or consent of instructor.

Phi 570 - Philosophy of Science (4)

History and philosophy of the scientific method. Topics include an overview of the major models of the scientific method (inductivism, falsificationism, Kuhnian paradigms, etc.) and issues pertaining to the accuracy of these models and their rationality such as theory-ladenness of observation, testing-holism, and the incommensurability of theory change. Also offered for undergraduate-level credit as Phl 470 and may be taken only once for credit. Recommended prerequisites: 8 credits in philosophy and upper-division standing.

Phi 571 - Topics in Philosophy of Science (4)

An in-depth analysis of some specific metaphysical issue pertaining to scientific epistemology such as (but not limited to) explanation, causation, realism, geometry, and relativism. Topics vary per course which will allow students to take course more than once, with departmental approval, to apply toward major requirements. Also offered for undergraduate-level credit as Phi 471 and may be taken only once for credit. Recommended prerequisites: 8 credits in philosophy and upper-division standing.

Phi 574 - Philosophy of Logic (4)

Topics: validity, sentence-proposition, connectives, quantifiers, truth, paradoxes, logical necessity and possibility. Optional topics: metalogic, the construction of formal systems of logic and formal proofs of certain of their properties, e.g., consistency and completeness. Also offered for undergraduate-level credit as Phi 474 and may be taken only once for credit. Recommended prerequisite: Phi 325.

Phi 581 - Biomedical Ethics (4)

A three-term sequence that provides a practical bioethics education in clinical health care, biomedical and behavioral research, and public policy. Phi 481/581: introduction to the concepts, methods, and literature of health care and biomedical research ethics, designed to familiarize participants with the basic definitions and arguments in the major topics of clinical and research ethics. Phi 482/582 and Phi 483/583: concepts and skills developed in 481/581 will be intensively examined; students take responsibility for several aspects of teaching. This is the first course in a sequence of three: Phi 581, Phi 582, and Phi 583 which must be taken in sequence. Also offered for undergraduate-level credit as Phi 481 and may be taken only once for credit. Recommended prerequisite: an acquaintance with health care services.

Phi 582 - Biomedical Ethics (4)

A three-term sequence that provides a practical bioethics education in clinical health care, biomedical and behavioral research, and public policy. Phi 481/581: introduction to the concepts, methods, and literature of health care and biomedical research ethics, designed to familiarize participants with the basic definitions and arguments in the major topics of clinical and research ethics. Phi 482/582 and Phi 483/583: concepts and skills developed in 481/581 will be intensively examined; students take responsibility for several aspects of teaching. This is the second course in a sequence of three: Phi 581, Phi 582, and Phi 583 which must be taken in sequence. Also offered for undergraduate-level credit as Phi 482 and may be taken only once for credit. Recommended prerequisite: an acquaintance with health care services.

Phi 583 - Biomedical Ethics (4)

A three-term sequence that provides a practical bioethics education in clinical health care, biomedical and behavioral research, and public policy. Phi 481/581: introduction to the concepts, methods, and literature of health care and biomedical research ethics, designed to familiarize participants with the basic definitions and arguments in the major topics of clinical and research ethics. Phi 482/582 and Phi 483/583: concepts and skills developed in 481/581 will be intensively examined; students take responsibility for several aspects of teaching. This is the third course in a sequence of three: Phi 581, Phi 582, and Phi 583 which must be taken in sequence. Also offered for undergraduate-level credit as Phi 483 and may be taken only once for credit. Recommended prerequisite: an acquaintance with health care services.

Ph - Physics

Ph 101 - Essentials of Physics (4)

An elementary introduction to the basic principles of physics, their interpretation and application. Designed to accommodate all liberal arts students. This is the first course in a sequence of two: Ph 101 and Ph 102. Concurrent enrollment in Ph 104, 105 is encouraged. Recommended prerequisite: high school algebra.

Ph 102 - Essentials of Physics (4)

An elementary introduction to the basic principles of physics, their interpretation and application. Designed to accommodate all liberal arts students. This is the second course in a sequence of two: Ph 101 and Ph 102. Concurrent enrollment in Ph 104, 105 is encouraged. Recommended prerequisite: high school algebra.

Ph 104 - Experimental Investigations for Non-science Majors (2)

Discovery labs for essential laws of physics. Investigate gravity, force, acceleration, momentum, heat, work, energy, electricity, light, and radioactivity. Make simple electrical circuits and an electrical motor. Improve computer literacy by working with graphic models of radioactive decay. This is the first course in a sequence of two: Ph 104 and Ph 105. One two-hour discussion and laboratory period. Concurrent enrollment in Ph 101, 102 is encouraged. Recommended prerequisite: high school algebra.

Ph 105 - Experimental Investigations for Non-science Majors (2)

Discovery labs for essential laws of physics. Investigate gravity, force, acceleration, momentum, heat, work, energy, electricity, light, and radioactivity. Make simple electrical circuits and an electrical motor. Improve computer literacy by working with graphic models of radioactive decay. This is the second course in a sequence of two: Ph 104 and Ph 105. One two-hour discussion and laboratory period. Concurrent enrollment in Ph 101, 102 is encouraged. Recommended prerequisite: high school algebra.
Ph 201 - General Physics (4)
An introductory historical, descriptive, and interpretative study of astronomy. Emphasis on the basic scientific methods as they apply to astronomical problems. Detailed examination of the earth, followed by a survey of the other members of the solar system. Survey of the stars, their types, grouping, and motions. Models for the evolution of the Universe and the possibility of life elsewhere. The nature of light, the types of information it carries, and the types of devices used to detect it. This is the first course in a sequence of two: Ph 121 and Ph 122 which need not be taken in sequence.

Ph 214 - General Physics (4)
Introductory physics for science majors. The student will explore topics in physics including Newtonian mechanics, electricity, and magnetism, thermal physics, optics, and modern physics. This is the third course in a sequence of three: Ph 201, Ph 202, and Ph 203 and must be taken in sequence.

Prerequisite: Ph 202. Corequisite: Ph 216.

Ph 204L - Lab for Ph 201 (1)
Lab for Ph 201.
Corequisite: Ph 201.

Ph 203 - General Physics (4)
Introductory physics for science majors. The student will explore topics in physics including Newtonian mechanics, electricity, and magnetism, thermal physics, optics, and modern physics. This is the third course in a sequence of three: Ph 201, Ph 202, and Ph 203 and must be taken in sequence.

Prerequisite: Ph 202. Corequisite: Ph 216.

Ph 206L - Lab for Ph 202 (1)
Lab for Ph 202.
Corequisite: Ph 202.

Ph 221 - General Physics (with Calculus) (4)
Introductory physics for students majoring in science and engineering. The student will explore topics in physics including statics, dynamics, electromagnetism, thermodynamics, and optics using the methods of calculus. This is the first course in a sequence of three: Ph 211, Ph 212, and Ph 213. Recommended prerequisites: for Ph 211, Mth 251; for Ph 212, Ph 211 and Ph 214; for Ph 213, Ph 212 and Ph 215. Corequisites: for Ph 211, Ph 214; for Ph 212, Ph 215; for Ph 213, Ph 216.

Corequisite: Ph 215.

Ph 213 - General Physics (with Calculus) (4)
Introductory physics for students majoring in science and engineering. The student will explore topics in physics including statics, dynamics, electromagnetism, thermodynamics, and optics using the methods of calculus. This is the third course in a sequence of three: Ph 211, Ph 212, and Ph 213. Recommended prerequisites: for Ph 211, Mth 251; for Ph 212, Ph 211 and Ph 214; for Ph 213, Ph 212 and Ph 215. Corequisites: for Ph 211, Ph 214; for Ph 212, Ph 215; for Ph 213, Ph 216.

Corequisite: Ph 215.

Ph 212 - General Astronomy (4)
An introductory historical, descriptive, and interpretative study of astronomy. Emphasis on the basic scientific methods as they apply to astronomical problems. Detailed examination of the earth, followed by a survey of the other members of the solar system. Survey of the stars, their types, grouping, and motions. Models for the evolution of the Universe and the possibility of life elsewhere. The nature of light, the types of information it carries, and the types of devices used to detect it. This is the second course in a sequence of two: Ph 121 and Ph 122 which need not be taken in sequence.

Ph 122 - General Astronomy (4)
An introductory historical, descriptive, and interpretative study of astronomy. Emphasis on the basic scientific methods as they apply to astronomical problems. Detailed examination of the earth, followed by a survey of the other members of the solar system. Survey of the stars, their types, grouping, and motions. Models for the evolution of the Universe and the possibility of life elsewhere. The nature of light, the types of information it carries, and the types of devices used to detect it. This is the second course in a sequence of two: Ph 121 and Ph 122 which need not be taken in sequence.

Ph 199 - Special Studies (1-3)
(Credit to be arranged.)

Ph 201 - General Physics (4)
Introductory physics for science majors. The student will explore topics in physics including Newtonian mechanics, electricity, and magnetism, thermal physics, optics, and modern physics. This is the first course in a sequence of three: Ph 201, Ph 202, and Ph 203 and must be taken in sequence.

Prerequisite: Mth 112. Corequisite: Ph 214.

Ph 202 - General Physics (4)
Introductory physics for science majors. The student will explore topics in physics including Newtonian mechanics, electricity, and magnetism, thermal physics, optics, and modern physics. This is the second course in a sequence of three: Ph 201, Ph 202, and Ph 203 and must be taken in sequence.

Ph 201L - Lab for Ph 201 (1)
Lab for Ph 201.
Corequisite: Ph 201.

Ph 203L - Lab for Ph 202 (1)
Lab for Ph 202.
Corequisite: Ph 202.

Ph 205L - Lab for Ph 203 (1)
Lab for Ph 203.
Corequisite: Ph 203.

Ph 211 - General Physics (with Calculus) (4)
Introductory physics for students majoring in science and engineering. The student will explore topics in physics including statics, dynamics, electromagnetism, thermodynamics, and optics using the methods of calculus. This is the first course in a sequence of three: Ph 211, Ph 212, and Ph 213. Recommended prerequisites: for Ph 211, Mth 251; for Ph 212, Ph 211 and Ph 214; for Ph 213, Ph 212 and Ph 215. Corequisites: for Ph 211, Ph 214; for Ph 212, Ph 215; for Ph 213, Ph 216.

Corequisite: Ph 215.

Ph 212 - General Physics (with Calculus) (4)
Introductory physics for students majoring in science and engineering. The student will explore topics in physics including statics, dynamics, electromagnetism, thermodynamics, and optics using the methods of calculus. This is the second course in a sequence of three: Ph 211, Ph 212, and Ph 213. Recommended prerequisites: for Ph 211, Mth 251; for Ph 212, Ph 211 and Ph 214; for Ph 213, Ph 212 and Ph 215. Corequisites: for Ph 211, Ph 214; for Ph 212, Ph 215; for Ph 213, Ph 216.

Corequisite: Ph 215.
and Ph 215. Corequisites: for Ph 221, Ph 224; for Ph 222, Ph 215; for Ph 223, Ph 216.

Corequisite: Ph 214.

Ph 222 - General Physics (with Calculus) (3)
Introductory physics for students majoring in engineering. The student will explore topics in physics including statics, dynamics, electromagnetism, thermodynamics, and optics using the methods of calculus. This is the second course in a sequence of three: Ph 221, Ph 222, and Ph 223. Recommended prerequisites: for Ph 221, Mth 251; for Ph 222, Ph 221 and Ph 214; for Ph 223, Ph 222 and Ph 215. Corequisites: for Ph 221, Ph 224; for Ph 222, Ph 215; for Ph 223, Ph 216.

Corequisite: Ph 215.

Ph 223 - General Physics (with Calculus) (3)
Introductory physics for students majoring in engineering. The student will explore topics in physics including statics, dynamics, electromagnetism, thermodynamics, and optics using the methods of calculus. This is the third course in a sequence of three: Ph 221, Ph 222, and Ph 223. Recommended prerequisites: for Ph 221, Mth 251; for Ph 222, Ph 221 and Ph 214; for Ph 223, Ph 222 and Ph 215. Corequisites: for Ph 221, Ph 224; for Ph 222, Ph 215; for Ph 223, Ph 216.

Corequisite: Ph 216.

Ph 261 - General Astronomy (4)
Introductory historical, descriptive, and interpretive study of astronomy. Emphasis is on the basic scientific methods as they apply to astronomical problems. Detailed examination of the earth, followed by a survey of the other members of the solar system. Survey of the stars, their types, grouping, and motions. Models for the evolution of the Universe and the possibility of life elsewhere. The nature of light, the types of information it carries, and the types of devices used to detect it. Includes laboratory and/or fieldwork. This is the first course in a sequence of two: Ph 261 and Ph 262.

Ph 262 - General Astronomy (4)
Introductory historical, descriptive, and interpretive study of astronomy. Emphasis is on the basic scientific methods as they apply to astronomical problems. Detailed examination of the earth, followed by a survey of the other members of the solar system. Survey of the stars, their types, grouping, and motions. Models for the evolution of the Universe and the possibility of life elsewhere. The nature of light, the types of information it carries, and the types of devices used to detect it. Includes laboratory and/or fieldwork. This is the second course in a sequence of two: Ph 261 and Ph 262.

Ph 262U - General Astronomy (4)
Introductory historical, descriptive, and interpretive study of astronomy. Emphasis is on the basic scientific methods as they apply to astronomical problems. Detailed examination of the earth, followed by a survey of the other members of the solar system. Survey of the stars, their types, grouping, and motions. Models for the evolution of the Universe and the possibility of life elsewhere. The nature of light, the types of information it carries, and the types of devices used to detect it. Includes laboratory and/or fieldwork. This is the second course in a sequence of two: Ph 261 and Ph 262.

Ph 299 - Special Studies (1-8)
(Credit to be arranged.)

Ph 311 - Introduction to Modern Physics (4)
The revolution in the concepts of physics in the 20th century. Radioactivity, quanta, black-body radiation, relativity. Bohr’s theory of the atom. Introduction to quantum mechanics. Atomic, molecular spectroscopy, periodic table. Introduction to nuclear and solid state physics, and elementary particles. This is the first course in a sequence of two: Ph 311 and Ph 312. Recommended prerequisites: Ph 203, or Ph 213 and Mth 252.

Ph 312 - Introduction to Modern Physics (4)
The revolution in the concepts of physics in the 20th century. Radioactivity, quanta, black-body radiation, relativity. Bohr’s theory of the atom. Introduction to quantum mechanics. Atomic, molecular spectroscopy, periodic table. Introduction to nuclear and solid state physics, and elementary particles. This is the second course in a sequence of two: Ph 311 and Ph 312. Recommended prerequisites: Ph 203, or Ph 213 and Mth 252.

Ph 313 - Ideas in Modern Physics (4)
Fundamental ideas of the modern physics of this century. Topics include the development of relativity, quantum mechanics, nuclear and particle physics, and cosmology. Recommended prerequisite: one college-level science course.

Ph 314 - Experimental Physics I (4)
Experiments in electrical measurements, digital logic circuits with applications to experimental control and computer interfacing, and analog circuits. Two 3-hour lab periods. This is the first course in a sequence of three: Ph 314, Ph 315 and Ph 316.

Ph 315 - Experimental Physics II (4)
Experiments in electrical measurements, digital logic circuits with applications to experimental control and computer interfacing, and analog circuits. Two 3-hour lab periods. This is the second course in a sequence of three: Ph 314, Ph 315 and Ph 316.

Ph 316 - Experimental Physics III (4)
Students will perform several experiments illustrating quantum and relativistic effects. The emphasis will be on computer-assisted experimentation and data analysis. Experiments will include instrumentation and counting in nuclear physics, measurement of band gap in semiconductors, measurement of ratio of electron charge to electron mass, speed of light, Frank-Hertz experiment and electron spin resonance. Two 3-hour laboratory periods. This is the third course in a sequence of three: Ph 314, Ph 315 and Ph 316. Expected preparation: Ph 311.
Ph 319 - Solid State Physics for Engineering Students (4)
Survey of solid state physics including topics necessary for understanding crystalline solids and their electron transport processes. Topics include crystal lattices, x-ray diffraction, concepts of quantum physics, the Schrodinger equation, electron tunneling, physical statistics, the free electron theory of metals, periodic potentials, semiconductors, and superconductors. Recommended prerequisite: Ph 213 or 223.

Ph 321 - Current Electricity (4)
Electric potential and current; Kirchoff's Laws and equivalent circuits. Transient and A.C. behavior of circuit elements. Theory of operation of diodes and transistors. Recommended prerequisites: Ph 203 or 213; concurrent enrollment in Ph 314.
Corequisite: Ph 314.

Ph 322 - Computational Physics (4)
Formulation and numerical solution of physics problems. Use of computers and graphical displays to enhance intuition and supplement analytical procedures. Approaches to complex physical situations, especially those involving dissipative, nonlinear and stochastic phenomena. Recommended prerequisite: Working knowledge of at least one computer language.

Ph 331 - Physics of Music (4)
A series of lectures and laboratories illustrating the basic principles of acoustics and their application to string, wind, brass, and percussion/instruments. Some of the laboratory exercises are adaptable for use in primary and secondary school classes. Recommended prerequisite: one year of music, or one year of a physical science.

Ph 333 - Weather (4)
Introductory course in the atmospheric environment providing a comprehensive understanding of atmospheric structure and the changes over time that result in the weather we experience. Topics include: atmospheric moisture (fog, rain, clouds), atmospheric stability and cloud development, air pressure and winds, air masses and fronts, and hurricanes and tornados. This course is the same as Geog 333; course may be taken only once for credit. Recommended: upper division standing or Geog 210.

Ph 333U - Weather (4)
Introductory course in the atmospheric environment providing a comprehensive understanding of atmospheric structure and the changes over time that result in the weather we experience. Topics include: atmospheric moisture (fog, rain, clouds), atmospheric stability and cloud development, air pressure and winds, air masses and fronts, and hurricanes and tornados. This course is the same as Geog 333; course may be taken only once for credit. Recommended: upper division standing or Geog 210.

Crosslisted as: Geog 333U.

Ph 335 - Wacky or Real: What Everyone Should Know About Physics Scams (4)
The use and misuse of physics: beginning with a firm understanding of the strengths and weaknesses of the scientific method, analyzes how people veer away from it, resulting in pathological, junk, pseudo and fraudulent physics. Examples such as magnetic therapy, perpetual motion, ESP, X-ray cures, and astrology are included.

Ph 335U - Wacky or Real: What Everyone Should Know About Physics Scams (4)
The use and misuse of physics: beginning with a firm understanding of the strengths and weaknesses of the scientific method, analyzes how people veer away from it, resulting in pathological, junk, pseudo and fraudulent physics. Examples such as magnetic therapy, perpetual motion, ESP, X-ray cures, and astrology are included. Recommended prerequisites: upper division standing or Geog 210.

Ph 363 - Color Photography (3)
The physics of color and scientific explanations of the formation of color images on light-sensitive materials. Traces uses and the history of color photography. Recommended prerequisite: one college- level science or photography course.

Ph 365 - Fractals, Chaos, and Complexity (4)
Introduction to the basic physical ideas behind fractals in nature, chaos, complexity, and other current concepts in physics, with emphasis on fractals and chaos. Computer simulations and desktop experiments involving fractals, chaos, and complex systems. Recommended prerequisite: astronomy, general physics, or Natural Science Inquiry.

Ph 366 - Complexity and the Universe I (4)
Introduction to the basic physical ideas behind complexity and other current concepts in physics. Computer simulations and desktop experiments involving fractals, chaos, and complex systems. Includes laboratory and/or fieldwork.

Ph 366U - Complexity and the Universe I (4)
Introduction to the basic physical ideas behind complexity and other current concepts in physics. Computer simulations and desktop experiments involving fractals, chaos, and complex systems. Includes laboratory and/or fieldwork. Recommended prerequisite: general physics or Natural Science Inquiry.

Ph 367 - Complexity and the Universe II (4)
Continuation of Sci 318/Ph 366. Emphasizes scientific cosmology with a focus on understanding how insights gained from physics and astronomy affect your view of the universe and your place in it. Students...
participate actively in seeing how some of the information was gathered, to help critically analyze what to believe about the history and arrangement of the universe and what it means to them. Includes laboratory and/or fieldwork.

**Ph 367U - Complexity and the Universe II (4)**
Continuation of Sci 318/Ph 366. Emphasizes scientific cosmology with a focus on understanding how insights gained from physics and astronomy affect your view of the universe and your place in it. Students participate actively in seeing how some of the information was gathered, to help critically analyze what to believe about the history and arrangement of the universe and what it means to them. Includes laboratory and/or fieldwork. Recommended prerequisite: astronomy, general physics, or Natural Science Inquiry.

**Ph 371 - Fractals, Chaos, Complexity, and Other Current Topics in Physics (4)**
Introductory survey to current concepts in fractals in the natural world, chaos, complexity, and other related topics in physics. Computer simulations and the use of microcomputers, desktop experiments are an essential part of the course. Recommended prerequisite: one year of general physics.

**Ph 375 - Climate Change and Human Life (4)**
An introduction to the global environment and how human activities are causing climatic changes, ozone depletion, and deforestation. Emphasizes the interrelationship between environmental processes. Deals with the qualitative aspects of how the earth’s climate works, how it can be altered by burning of fossil fuels (emissions of carbon dioxide) and by the increasing concentrations of other "greenhouse gases"; how the ozone layer can be depleted by man-made chemicals, and what is being done, or can be done to avert the undesirable consequences of these global changes.

**Ph 375U - Climate Change and Human Life (4)**
An introduction to the global environment and how human activities are causing climatic changes, ozone depletion, and deforestation. Emphasizes the interrelationship between environmental processes. Deals with the qualitative aspects of how the earth’s climate works, how it can be altered by burning of fossil fuels (emissions of carbon dioxide) and by the increasing concentrations of other "greenhouse gases"; how the ozone layer can be depleted by man-made chemicals, and what is being done, or can be done to avert the undesirable consequences of these global changes.

**Ph 378 - Science Through Science Fiction (4)**
This class uses science fiction literature to examine a wide variety of topics in science.

**Ph 378U - Science Through Science Fiction (4)**
This class uses science fiction literature to examine a wide variety of topics in science. Recommended prerequisites: astronomy, general physics, or Natural Science Inquiry. Also listed as Sci 355; course may be taken only once for credit.

**Ph 381 - Physical Metallurgy for Engineers (3)**
Crystal structure of metals and their relationships to properties. Phase diagrams of alloys, heat treatment, mechanical properties, and corrosion. Methods of fabrication of metals. Two lectures; one 3-hour laboratory period. Recommended prerequisites: EAS 213, Ph 213 or 223, Ch 223.

**Ph 382 - Introduction to Nanoscience and Nanotechnology (4)**
Basic introduction to nanoscience and nanotechnology for all interested science, engineering and social science and humanities students. This is the same course as Sci 382 and may be taken only once for credit.

Crosslisted as: Sci 382.

**Ph 382U - Introduction to Nanoscience and Nanotechnology (4)**
Basic introduction to nanoscience and nanotechnology for all interested science, engineering and social science and humanities students. This is the same course as Sci 382 and may be taken only once for credit.

Crosslisted as: Sci 382U.

**Ph 399 - Special Studies (0-6)**
(Credit to be arranged.)
for graduate-level credit as Ph 515 and may be taken only once for credit. Recommended prerequisite: Ph 203 or Ph 213.

Ph 424 - Classical Mechanics I (4)

Ph 425 - Classical Mechanics II (4)
Advanced formulation of mechanics. Lagrange’s and Hamilton’s equations. The inertial tensor, free rotations, and rigid body dynamics. Theory of small oscillations, coupled oscillations and normal modes. Also offered for graduate-level credit as Ph 525 and may be taken only once for credit. Recommended prerequisites: Ph 424 and Mth 256.

Ph 426 - Thermodynamics and Statistical Mechanics (4)
Concepts of temperature, work, and heat; first and second laws of thermodynamics and applications; thermodynamic potentials; heat engines, Carnot cycle, and ideal gases; entropy and its statistical interpretation; kinetic theory of gases; classical and quantum statistics; introduction to statistical mechanical ensembles. Also offered for graduate-level credit as Ph 526 and may be taken only once for credit. Recommended prerequisites: Ph 203 or Ph 213, Mth 254, and Ph 311.

Ph 431 - Electricity and Magnetism I (4)
Advanced study of electricity and magnetism covering field and potential of charge arrays, electrostatic field energy, images, multipoles, Laplace’s equation, Biot-Savart and Ampere’s laws, magnetic field energy, vector potential, displacement current, dielectrics and their microscopic models, electromagnetic wave equations, boundary conditions, energy radiation, magnetic materials and their microscopic models. This is the first course in a sequence of two: Ph 431 and Ph 432. Also offered for graduate-level credit as Ph 531 and may be taken only once for credit. Expected preparation: Ph 312 and Mth 256.

Ph 432 - Electricity and Magnetism II (4)
Advanced study of electricity and magnetism covering field and potential of charge arrays, electrostatic field energy, images, multipoles, Laplace’s equation, Biot-Savart and Ampere’s laws, magnetic field energy, vector potential, displacement current, dielectrics and their microscopic models, electromagnetic wave equations, boundary conditions, energy radiation, magnetic materials and their microscopic models. This is the second course in a sequence of two: Ph 431 and Ph 432. Also offered for graduate-level credit as Ph 532 and may be taken only once for credit. Expected preparation: Ph 312 and Mth 256.

Ph 434 - Methods of Mathematical Physics (4)
A survey of methods of applied mathematics used in modern physics, to include: vectors, matrices, operators, and eigenvalues; perturbation theory and series expansion; variation and optimization; numerical methods; transforms; and special functions. Also offered for graduate-level credit as Ph 534 and may be taken only once for credit. Recommended prerequisites: Ph 312 and Mth 256.

Ph 440 - Physics of Solid State Devices (4)
This is a survey intended to provide the foundation necessary for understanding of function, technology and design of solid state devices, rather than their application. Topics will include: introduction to and application of concepts of quantum physics to solids, effect of periodicity in solids on electron energy states, electron statistics, metals, insulators, semiconductors and superconductors, thermionic field assisted electron emission, electron scattering and mobility of charge carriers, intrinsic and extrinsic semiconductors, quantitative treatment of p-n junction, diffusion and recombination of excess carriers, quantitative treatment of electron injection, majority and minority components of the junction current, breakdown, quantitative treatments of bipolar junction transistor, field effect transistor and tunnel diodes, physics of metal-semiconductor and metal-insulator-semiconductor junctions and devices, superconductivity and superconducting devices, DC and AC Josephson effects, Josephson junctions, superconductive quantum interference devices. This is the second course in a sequence of two: Ph 440 and Ph 441. Also offered for graduate-level credit as Ph 541 and may be taken only once for credit. Recommended prerequisite: Ph 312 or Ph 318.

Ph 445 - Microelectronic Device Fabrication I (4)
The first part of the series includes crystal growth, crystal structure, wafer preparation, ion implantation, doping and diffusion, oxidation, defects, heterogeneous chemical reactions, thermodynamics and kinetics of basic processes such as diffusion and oxidation. These concepts are applied both to IC and photovoltaic device fabrication. Realistic process flows, physical metrology, device structure, electrical behavior and their trade-offs are discussed. Extension and limitation of “top-down” processing to fabrication of nanoscale structures such as nano-rods, nano-wires, etc., and application of these to devices are also introduced. Also
transmission and scanning electron microscopes, Microchemical analysis with an energy dispersive spectrometer. Specimens from all the sciences. Two lectures, one 3-hour laboratory period. This is the first course in a sequence of two: Ph 451 and Ph 452. Also offered for graduate-level credit as Ph 551 and may be taken only once for credit. Recommended prerequisites: one year of general physics and one year of any other science.

**Ph 452 - Electron Microscopy (4)**

Electron optics theory, specimen preparation and experimental work with the different types of electron microscopes, Microchemical analysis with an energy dispersive spectrometer. Specimens from all the sciences. Two lectures, one 3-hour laboratory period. This is the second course in a sequence of two: Ph 451 and Ph 452. Also offered for graduate-level credit as Ph 552 and may be taken only once for credit. Recommended prerequisites: one year of general physics and one year of any other science.

**Ph 446 - Microelectronic Device Fabrication II (4)**

The emphasis of second part of this series is on metallization, dielectrics, and multilevel interconnects. Metallization issues discussed will include siliconization, barrier layers, interconnects, multilevel metallization architecture, and low-k dielectrics. This is be followed by discussion of deposition and properties of various dielectric films. Epitaxial growth and properties of SOI and SiGe devices are also covered. In all these discussions, physics related to fabrication of nanoscale devices and special effects that come into play at these dimensions will be examined. Assignments will include computer simulations of device fabrication (i.e., virtual fab software). Also offered for graduate-level credit as Ph 546 and may be taken only once for credit.

**Prerequisite:** Ph 445 or Ph 545 or consent of instructor.

**Ph 447 - Microelectronic Device Fabrication III (4)**

The third part of this series starts with the techniques required to pattern the nanoscale structures on wafers. These techniques include electron beam, x-ray, EUV, and photolithography, including discussion of resist technology. This is followed by methods to produce these structures using wet and dry methods. Discussion of dry processing includes fundamentals and applications of plasmas for etching and deposition (e.g., high-density plasmas), including plasma damage. The limitations of fabrication and operation of nano-scale devices are discussed. Special project for this class will involve fabrication of a virtual device (bipolar junction transistor) with specified electrical performance parameters using the virtual fab software. Also offered for graduate-level credit as Ph 547 and may be taken only once for credit.

**Prerequisite:** Ph 446 or Ph 546 or consent of instructor.

**Ph 451 - Electron Microscopy (4)**

Electron optics theory, specimen preparation and experimental work with the different types of electron microscopes, Microchemical analysis with an energy dispersive spectrometer. Specimens from all the sciences. Two lectures, one 3-hour laboratory period. This is the first course in a sequence of two: Ph 451 and Ph 452. Also offered for graduate-level credit as Ph 551 and may be taken only once for credit. Recommended prerequisites: one year of general physics and one year of any other science.

**Ph 452 - Electron Microscopy (4)**

Electron optics theory, specimen preparation and experimental work with the different types of electron microscopes, Microchemical analysis with an energy dispersive spectrometer. Specimens from all the sciences. Two lectures, one 3-hour laboratory period. This is the second course in a sequence of two: Ph 451 and Ph 452. Also offered for graduate-level credit as Ph 552 and may be taken only once for credit. Recommended prerequisites: one year of general physics and one year of any other science.

**Ph 446 - Microelectronic Device Fabrication II (4)**

The emphasis of second part of this series is on metallization, dielectrics, and multilevel interconnects. Metallization issues discussed will include siliconization, barrier layers, interconnects, multilevel metallization architecture, and low-k dielectrics. This is be followed by discussion of deposition and properties of various dielectric films. Epitaxial growth and properties of SOI and SiGe devices are also covered. In all these discussions, physics related to fabrication of nanoscale devices and special effects that come into play at these dimensions will be examined. Assignments will include computer simulations of device fabrication (i.e., virtual fab software). Also offered for graduate-level credit as Ph 546 and may be taken only once for credit.

**Prerequisite:** Ph 445 or Ph 545 or consent of instructor.

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Electron optics theory, specimen preparation and experimental work with the different types of electron microscopes, Microchemical analysis with an energy dispersive spectrometer. Specimens from all the sciences. Two lectures, one 3-hour laboratory period. This is the second course in a sequence of two: Ph 451 and Ph 452. Also offered for graduate-level credit as Ph 552 and may be taken only once for credit. Recommended prerequisites: one year of general physics and one year of any other science.

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**Prerequisite:** Ph 446 or Ph 546 or consent of instructor.
Ph 477 - Air Pollution (4)
Air pollution meteorology needed to understand air pollution, atmospheric dispersion models, K-theory, box models and receptor models. Use of simple computer models. This course is a foundation for the quantitative understanding of air pollution: At any point in the environment (receptor), how much pollution is caused by a known source? If there are many sources, how much pollution does each source contribute at a receptor? Also offered for graduate-level credit as Ph 577 and may be taken only once for credit. Recommended prerequisites: Ph 213 or Ph 223, one year of calculus, introductory course in differential equations.

Ph 481 - Introduction to Nano(materials)-Science and -Engineering (4)
An introduction to nano(materials)-science and -engineering for students in physics, chemistry, geology, electrical and computer engineering, and mechanical and materials engineering. Nanoscale processes and devices and their applications. Also offered for graduate-level credit as Ph 581 and may be taken only once for credit. Recommended prerequisites: two specific advanced upper division science courses dependent on major, or consent of instructor.

Ph 482 - Physical Metallurgy (2)
Introduction to principles of physical metallurgy. Includes the atomic and crystallographic structures of metals and alloys; defects in structure and the importance of them in determining the properties of metals; phase diagrams of alloy systems and examples of important systems; diffusion and phase transformations, emphasizing the solid state; plasticity and fracture of crystals; and corrosion. Recommended prerequisites: Ph 203, Ch 223.

Ph 483 - Physical Metallurgy (2)
Introduction to principles of physical metallurgy. Includes the atomic and crystallographic structures of metals and alloys; defects in structure and the importance of them in determining the properties of metals; phase diagrams of alloy systems and examples of important systems; diffusion and phase transformations, emphasizing the solid state; plasticity and fracture of crystals; and corrosion.

Ph 484 - Physical Metallurgy Laboratory (1)
Experimental studies of the structure of metals by light microscope, X-ray diffraction, and microhardness techniques. Heat treatment of metals and studies of the resulting structural changes. Corequisite: concurrent enrollment in Ph 481, 482, 483.

Ph 485 - Physical Metallurgy Laboratory (1)
Experimental studies of the structure of metals by light microscope, X-ray diffraction, and microhardness techniques. Heat treatment of metals and studies of the resulting structural changes. Corequisite: concurrent enrollment in Ph 481, 482, 483.

Ph 486 - Physical Metallurgy Laboratory (1)
Experimental studies of the structure of metals by light microscope, X-ray diffraction, and microhardness techniques. Heat treatment of metals and studies of the resulting structural changes. Corequisite: concurrent enrollment in Ph 481, 482, 483.

Ph 490 - Cellular and Molecular Biophysics (4)
An introduction to the physical ideas and methods in the studies of biological phenomena, organization, structure, and function at the cellular and molecular level. Atomic and molecular structures, energy and interacting forces relating to cellular and molecular biophysics will be discussed. This is the first course in a sequence of two: Ph 490 and Ph 491. Also offered for graduate-level credit as Ph 590 and may be taken only once for credit. Recommended prerequisites: Ph 203, Bi 253, and Ch 223. Calculus, previously or concurrently, is recommended.

Ph 491 - Cellular and Molecular Biophysics (4)
An introduction to the physical ideas and methods in the studies of biological phenomena, organization, structure, and function at the cellular and molecular level. Atomic and molecular structures, energy and interacting forces relating to cellular and molecular biophysics will be discussed. This is the second course in a sequence of two: Ph 490 and Ph 491. Also offered for graduate-level credit as Ph 591 and may be taken only once for credit. Recommended prerequisites: Ph 203, Bi 253, and Ch 223. Calculus, previously or concurrently, is recommended.

Ph 501 - Research (1-9)
(Credit to be arranged.) Consent of instructor.

Ph 502 - Independent Study (1-6)
(Credit to be arranged.)

Ph 503 - Thesis (1-9)
(Credit to be arranged.)

Ph 504 - Cooperative Education/Internship (1-9)
(Credit to be arranged.)

Ph 505 - Reading and Conference (1-6)
(Credit to be arranged.) Consent of instructor.

Ph 506 - Special Projects (1-9)
(Credit to be arranged.) Consent of instructor.

Ph 507 - Seminar (0-6)
(Credit to be arranged.) Consent of instructor.

Ph 510 - Selected Topics (1-6)
(Credit to be arranged.) Consent of instructor.

Ph 511 - Introduction to Quantum Mechanics (4)
An introduction to the formulation and application of wave mechanics; the Schrodinger equation and its application to time-independent problems (both one- and three-dimensional problems); identical particles; approximation methods including mainly time-independent perturbations. Brief exploration of the potential applications of quantum mechanics to engineering: quantum nano-structures and quantum computers. Also offered for undergraduate-level credit as Ph 411; this course is the same as ECE 598; course may only be taken once for credit. Recommended prerequisites: Ph 318 or 311, Mth 256. Crosslisted as: ECE 598.

Ph 513 - Introduction to Solid State Physics (4)
Experimental and theoretical survey of the lattice and electronic properties of solids with particular emphasis on the properties of electrons in metals. Also offered for
undergraduate-level credit as Ph 413 and may be taken only once for credit. Recommended prerequisite: Ph 411 or Ph 312.

**Ph 515 - Experimental Optics (3)**

Advanced experiments in physical optics. One 4-hour laboratory period. Also offered for undergraduate-level credit as Ph 415 and may be taken only once for credit. Recommended prerequisite: Ph 203 or Ph 213.

**Ph 525 - Classical Mechanics II (4)**

Advanced formulation of mechanics. Lagrange's and Hamilton's equations. The inertial tensor, free rotations, and rigid body dynamics. Theory of small oscillations, coupled oscillations and normal modes. Also offered for undergraduate-level credit as Ph 425 and may be taken only once for credit. Recommended prerequisites: Ph 424 and Mth 256.

**Ph 526 - Thermodynamics and Statistical Mechanics (4)**

Concepts of temperature, work, and heat; first and second laws of thermodynamics and applications; thermodynamic potentials; heat engines, Carnot cycle, and ideal gases; entropy and its statistical interpretation; kinetic theory of gases; classical and quantum statistics; introduction to statistical mechanical ensembles. Also offered for undergraduate-level credit as Ph 426 and may be taken only once for credit. Recommended prerequisites: Ph 203 or Ph 213, Mth 254, and Ph 311.

**Ph 531 - Electricity and Magnetism (4)**

Advanced study of electricity and magnetism covering field and potential of charge arrays, electrostatic field energy, images, multipoles, Laplace's equation, Biot-Savart and Ampere's laws, magnetic field energy, vector potential, displacement current, dielectrics and their microscopic models, electromagnetic wave equations, boundary conditions, energy radiation, magnetic materials and their microscopic models. This is the first course in a sequence of two: Ph 531 and Ph 532. Also offered for undergraduate-level credit as Ph 431 and may be taken only once for credit. Recommended prerequisites: Ph 312 and Mth 256.

**Ph 532 - Electricity and Magnetism (4)**

Advanced study of electricity and magnetism covering field and potential of charge arrays, electrostatic field energy, images, multipoles, Laplace's equation, Biot-Savart and Ampere's laws, magnetic field energy, vector potential, displacement current, dielectrics and their microscopic models, electromagnetic wave equations, boundary conditions, energy radiation, magnetic materials and their microscopic models. This is the second course in a sequence of two: Ph 531 and Ph 532. Also offered for undergraduate-level credit as Ph 432 and may be taken only once for credit. Recommended prerequisites: Ph 312 and Mth 256.

**Ph 534 - Methods of Mathematical Physics (4)**

A survey of methods of applied mathematics used in modern physics, to include: vectors, matrices, operators, and eigenvalues; perturbation theory and series expansion; variation and optimization; numerical methods; transforms; and special functions. Also offered for undergraduate-level credit as Ph 434 and may be taken only once for credit. Recommended prerequisites: Ph 312 and Mth 256.

**Ph 540 - Physics of Solid State Devices (4)**

This is a survey intended to provide the foundation necessary for understanding of function, technology and design of solid state devices, rather than their application. Topics will include: introduction to and application of concepts of quantum physics to solids, effect of periodicity in solids on electron energy states, electron statistics, metals, insulators, semiconductors and superconductors, thermionic and field assisted electron emission, electron scattering and mobility of charge carriers, intrinsic and extrinsic semiconductors, quantitative treatment of p-n junction, diffusion and recombination of excess carriers, quantitative treatment of electron injection, majority and minority components of the junction current, breakdown, quantitative treatments of bipolar junction transistor, field effect transistor and tunnel diodes, physics of metal-semiconductor and metal-insulator-semiconductor junctions and devices, superconductivity and superconducting devices, DC and AC Josephson effects, Josephson junctions, superconductive quantum interference devices. This is the second course in a sequence of two: Ph 540 and Ph 541. Also offered for undergraduate-level credit as Ph 441 and may be taken only once for credit. Recommended prerequisite: Ph 312 or Ph 318.

**Ph 541 - Physics of Solid State Devices (4)**

This is a survey intended to provide the foundation necessary for understanding of function, technology and design of solid state devices, rather than their application. Topics will include: introduction to and application of concepts of quantum physics to solids, effect of periodicity in solids on electron energy states, electron statistics, metals, insulators, semiconductors and superconductors, thermionic and field assisted electron emission, electron scattering and mobility of charge carriers, intrinsic and extrinsic semiconductors, quantitative treatment of p-n junction, diffusion and recombination of excess carriers, quantitative treatment of electron injection, majority and minority components of the junction current, breakdown, quantitative treatments of bipolar junction transistor, field effect transistor and tunnel diodes, physics of metal-semiconductor and metal-insulator-semiconductor junctions and devices, superconductivity and superconducting devices, DC and AC Josephson effects, Josephson junctions, superconductive quantum interference devices. This is the second course in a sequence of two: Ph 540 and Ph 541. Also offered for undergraduate-level credit as Ph 441 and may be taken only once for credit. Recommended prerequisite: Ph 312 or Ph 318.

**Ph 545 - Microelectronic Devise Fabrication I (4)**

The first part of the series includes crystal growth, crystal structure, wafer preparation, ion implantation, doping and diffusion, oxidation, defects, heterogeneous chemical reactions, thermodynamics and kinetics of basic processes such as diffusion and oxidation. These concepts are applied both to IC and photovoltaic device fabrication. Realistic process flows, physical metrology, device structure, electrical behavior and their trade-offs are discussed. Extension and limitation of “top-down” processing to fabrication of nanoscale structures such as nano-rods, nano-wires, etc., and application
SiGe devices are also covered. In all these Epitaxial growth and properties of SOI and followed by discussion of deposition and undergraduate-level credit as Ph 446 and (i.e., virtual fab software). Also offered for computer simulations of device fabrication examined. Assignments will include calculations and properties of various dielectric films. Epitaxial growth and properties of SOI and SiGe devices are also covered. In all these discussions, physics related to fabrication of nanoscale devices and special effects that come into play at these dimensions will be examined. Assignments will include computer simulations of device fabrication (i.e., virtual fab software). Also offered for undergraduate-level credit as Ph 446 and may be taken only once for credit.

Prerequisite: Ph 445 or Ph 545 or consent of instructor.

Ph 546 - Microelectronic Device Fabrication II (4)

The emphasis of second part of this series is on metallization, dielectrics, and multilevel interconnects. Metallization issues discussed will include silicides, barrier layers, interconnects, multilevel metallization architecture, and low-k dielectrics. This is be followed by discussion of deposition and properties of various dielectric films. Epitaxial growth and properties of SOI and SiGe devices are also covered. In all these discussions, physics related to fabrication of nanoscale devices and special effects that come into play at these dimensions will be examined. Assignments will include computer simulations of device fabrication (i.e., virtual fab software). Also offered for undergraduate-level credit as Ph 446 and may be taken only once for credit.

Prerequisite: Ph 445 or Ph 545 or consent of instructor.

Ph 547 - Microelectronic Device Fabrication III (4)

The third part of this series starts with the techniques required to pattern the nanoscale structures on wafers. These techniques include electron beam, x-ray, EUV, and photolithography, including discussion of resist technology. This is followed by methods to produce these structures using wet and dry methods. Discussion of dry processing includes fundamentals and applications of plasmas for etching and deposition (e.g., high-density plasmas), including plasma damage. The limitations of fabrication and operation of nano-scale devices are discussed. Special project for this class will involve fabrication of a virtual device (bipolar junction transistor) with specified electrical performance parameters using the virtual fab software. Also offered for undergraduate-level credit as Ph 447 and may be taken only once for credit.

Prerequisite: Ph 446 or Ph 546 or consent of instructor.

Ph 551 - Electron Microscopy (4)

Electron optics theory, specimen preparation and experimental work with transmission and scanning electron microscopes, Microchemical analysis with an energy dispersive spectrometer. Specimens from all the sciences. Two lectures, one 3-hour laboratory period. This is the first course in a sequence of two: Ph 551 and Ph 552. Also offered for undergraduate-level credit as Ph 451 and may be taken only once for credit. Recommended prerequisites: one year of general physics and one year of any other science.

Ph 552 - Electron Microscopy (4)

Electron optics theory, specimen preparation and experimental work with transmission and scanning electron microscopes, Microchemical analysis with an energy dispersive spectrometer. Specimens from all the sciences. Two lectures, one 3-hour laboratory period. This is the second course in a sequence of two: Ph 551 and Ph 552. Also offered for undergraduate-level credit as Ph 452 and may be taken only once for credit. Recommended prerequisites: one year of general physics and one year of any other science.

Ph 564 - Applied Optics (4)

An overview of optics and such principal application as fiber optics; chemical, biological, and physical sensors; optical information processing, acousto-optics; lasers and detectors. This course is the same as ECE 594; course may only be taken once for credit. Also offered for undergraduate-level credit as Ph 464 and may be taken only once for credit. Recommended prerequisites: Ph 203 or Ph 213 or Ph 223, Mth 254.

Crosslisted as: ECE 594.

Ph 571 - Atmospheric Physics (4)

Cycles of trace gases in the earth’s atmosphere and their role in the environment. Emission, dispersal and removal of natural and man-made trace constituents in the atmosphere that determine the earth’s climate and the stratospheric ozone layer. Mass Balance Models for quantitative analysis of atmospheric composition and trends. Climate change and perturbations of stratospheric ozone in modern times. Lays a foundation for the understanding of the complex issues of climatic change and its many linkages and feedbacks. Questions regarding environmental policy and action are examined in the light of current model results, their predictions and uncertainties. Also offered for undergraduate-level credit as Ph 471; this is the same course as ESM 571 and may be taken only once for credit. Recommended prerequisites: one year each of calculus and calculus-based physics, introductory course in differential equations.

Crosslisted as: ESM 571.

Ph 572 - Introduction to Nonlinear Dynamics and Chaos (4)

Introduction to basic theoretical and experimental tools to study chaos and nonlinear behavior. Desktop experiments and computer simulations of chaotic systems. Also offered for undergraduate-level credit as Ph 472 and may be taken only once for credit. Recommended prerequisites: one year of general physics.

Ph 573 - Alternative Energies (4)

Starting with a review of global energy trends, this course will cover the major resources of alternative energies (hydropower, wave, tidal and wind energy, solar energy, nuclear fission and fusion), their characteristics, utilization and technology as well as environmental and public impact. Special attention will be given to photovoltaics and solar cell technology. Market developments will also be analyzed based on simple models. Also offered for undergraduate-level credit as Ph 473 and may be taken only once for credit.

Prerequisite: Ph 213 or Ph 223.

Ph 575 - Stellar Astronomy Online for Educators (4)

Class will access online materials in stellar astronomy education to help current and prospective science teachers update their knowledge of recent developments in astronomy. Also offered for undergraduate-level credit as Ph 475 and may be taken only once for credit. Recommended prerequisite: one year of general physics.

Ph 576 - Observational Astronomy (2)

Emphasis on hands-on activities and the observation of our own night sky. Observation of planets, sun, moon, globular clusters, galaxies, and black holes. Observational techniques including the use
of telescopes, binoculars, and photography will be covered. Observational field trip to an observatory at a dark sky site. Also offered for undergraduate-level credit as Ph 476 and may be taken only once for credit. Recommended prerequisite: one year of general physics.

Ph 577 - Air Pollution (4)

Air pollution meteorology needed to understand air pollution, atmospheric dispersion models, K-theory, box models and receptor models. Use of simple computer models. This course is a foundation for the quantitative understanding of air pollution: At any point in the environment (receptor), how much pollution is caused by a known source? If there are many sources, how much pollution does each source contribute at a receptor? Also offered for undergraduate-level credit as Ph 477 and may be taken only once for credit. Recommended prerequisites: Ph 213 or Ph 223, one year of calculus, introductory course in differential equations.

Ph 581 - Introduction to Nanomaterials-Science and Engineering (4)

An introduction to nanomaterials-science and engineering for students in physics, chemistry, geology, electrical and computer engineering, and mechanical and materials engineering. Nanoscale processes and devices and their applications. Also offered for undergraduate-level credit as Ph 481 and may be taken only once for credit. Recommended prerequisites: two specific advanced upper division science courses dependent on major, or consent of instructor.

Ph 582 - Physical Metallurgy (2)

Introduction to principles of physical metallurgy. Includes the atomic and crystallographic structures of metals and alloys; defects in structure and the importance of them in determining the properties of metals; phase diagrams of alloy systems and examples of important systems; diffusion and phase transformations, emphasizing the solid state; plasticity and fracture of crystals; and corrosion. Recommended prerequisites: Ph 203, Ch 223.

Ph 583 - Physical Metallurgy (2)

Introduction to principles of physical metallurgy. Includes the atomic and...
Ph 617 - Quantum Mechanics (4)
A detailed discussion of the approximation models for solving the time-independent Schrödinger equation; scattering theory in terms of stationary unbound states; time-dependent theory including the perturbation method; the two-level problem and its application to laser operation. Dirac’s formulation using bra and ket; different time-evolution pictures; concept of density matrices; Berry’s phase; quantum theory of angular momentum; Feynman’s path integral formulation; introduction to relativistic quantum mechanics; issues on the fundamental aspects of quantum mechanics including Bell’s theorem, the EPR paradox, hidden-variable theory; and Schrödinger’s cat problem. This is the first course in a sequence of three: Ph 617, Ph 618, and Ph 619.
Prerequisite: Ph 411/511, Ph 424.

Ph 618 - Quantum Mechanics (4)
A detailed discussion of the approximation models for solving the time-independent Schrödinger equation; scattering theory in terms of stationary unbound states; time-dependent theory including the perturbation method; the two-level problem and its application to laser operation. Dirac’s formulation using bra and ket; different time-evolution pictures; concept of density matrices; Berry’s phase; quantum theory of angular momentum; Feynman’s path integral formulation; introduction to relativistic quantum mechanics; issues on the fundamental aspects of quantum mechanics including Bell’s theorem, the EPR paradox, hidden-variable theory; and Schrödinger’s cat problem. This is the first course in a sequence of three: Ph 617, Ph 618, and Ph 619.
Prerequisite: Ph 411/511, Ph 424.

Ph 619 - Quantum Mechanics (4)
A detailed discussion of the approximation models for solving the time-independent Schrödinger equation; scattering theory in terms of stationary unbound states; time-dependent theory including the perturbation method; the two-level problem and its application to laser operation. Dirac’s formulation using bra and ket; different time-evolution pictures; concept of density matrices; Berry’s phase; quantum theory of angular momentum; Feynman’s path integral formulation; introduction to relativistic quantum mechanics; issues on the fundamental aspects of quantum mechanics including Bell’s theorem, the EPR paradox, hidden-variable theory; and Schrödinger’s cat problem. This is the first course in a sequence of three: Ph 617, Ph 618, and Ph 619.
Prerequisite: Ph 411/511, Ph 424.

Ph 624 - Classical Mechanics (4)
Advanced treatment of analytical mechanics of particles, systems of particles, and rigid bodies. Methods of Lagrange, Hamilton, and Jacobi. Symmetry and conservation laws. This is the first course in a sequence of two: Ph 624 and Ph 625. Recommended prerequisite: Ph 425.

Ph 625 - Classical Mechanics (4)
Advanced treatment of analytical mechanics of particles, systems of particles, and rigid bodies. Methods of Lagrange, Hamilton, and Jacobi. Symmetry and conservation laws. This is the second course in a sequence of two: Ph 624 and Ph 625. Recommended prerequisite: Ph 425.

Ph 626 - Hydrodynamics (4)
The theory of fluids and continuous media. Equations of continuity, Euler’s equation, flow fields, and applications. Recommended prerequisite: Ph 625.

Ph 631 - Electromagnetic Fields and Interactions (4)
Classical description of the electromagnetic field: classical electron theory and plasmas. This is the first course in a sequence of three: Ph 631, Ph 632, and Ph 633. This course is the same as ECE 635, 636, 637; course may only be taken once for credit.
Prerequisite: Ph 431. Crosslisted as: ECE 635.

Ph 632 - Electromagnetic Fields and Interactions (4)
Classical description of the electromagnetic field: classical electron theory and plasmas. This is the second course in a sequence of three: Ph 631, Ph 632, and Ph 633. This course is the same as ECE 635, 636, 637; course may only be taken once for credit.
Prerequisite: Ph 431. Crosslisted as: ECE 636.

Ph 633 - Electromagnetic Fields and Interactions (4)
Classical description of the electromagnetic field: classical electron theory and plasmas. This is the third course in a sequence of three: Ph 631, Ph 632, and Ph 633. This course is the same as ECE 635, 636, 637; course may only be taken once for credit.
Prerequisite: Ph 431. Crosslisted as: ECE 637.

Ph 641 - The Physics of Atoms and Molecules (4)
Radiation from atoms and molecules, Raman effect. Structure of one and many electron atoms, Zeeman effect, Stark effect, Lamb shift, hyperfine structure, line intensity. Quantum mechanics of diatomic and polyatomic molecules. Symmetry. Molecular electronic transitions. Valence and resonance. This is the first course in a sequence of two: Ph 641 and Ph 642. Recommended prerequisite: Ph 411.

Ph 642 - The Physics of Atoms and Molecules (4)

Ph 644 - Statistical Mechanics (4)
Foundations of statistical mechanics and kinetic theory; statistical interpretation of thermodynamics; ensembles in classical and quantum systems; transport phenomena. This is the first course in a sequence of three: Ph 644, Ph 665, and Ph 666. Recommended prerequisite: Ph 619 or 625.

Ph 645 - Statistical Mechanics (4)
Foundations of statistical mechanics and kinetic theory; statistical interpretation of thermodynamics; ensembles in classical and quantum systems; transport phenomena. This is the second course in a sequence of three: Ph 644, Ph 665, and Ph 666. Recommended prerequisite: Ph 619 or 625.

Ph 666 - Statistical Mechanics (4)
Foundations of statistical mechanics and kinetic theory; statistical interpretation of thermodynamics; ensembles in classical and quantum systems; transport phenomena. This is the second course in a sequence of three: Ph 644, Ph 665, and Ph 666. Recommended prerequisite: Ph 619 or 625.
thermodynamics; ensembles in classical and quantum systems; transport phenomena. This is the third course in a sequence of three: Ph 664, Ph 665, and Ph 666. Recommended prerequisite: Ph 619 or 625.

Ph 679 - Advanced Atmospheric Physics (4)
Advanced course to provide a working knowledge of base models for studying global change including the greenhouse effect, global warming, stratospheric ozone depletion from man-made chemicals, tropospheric chemistry of HO and O3 and transport modeling. Recommended prerequisites: Ph 578.

Port - Portuguese
Port 101 - First-year Portuguese (4)
An introduction to elementary Portuguese. Emphasis on listening comprehension and oral practice, the elements of grammar, vocabulary building, elementary readings. This is the first course in a sequence of three: Port 101, Port 102, and Port 103.

Port 102 - First-year Portuguese (4)
An introduction to elementary Portuguese. Emphasis on listening comprehension and oral practice, the elements of grammar, vocabulary building, elementary readings. This is the second course in a sequence of three: Port 101, Port 102, and Port 103.

Port 103 - First-year Portuguese (4)
An introduction to elementary Portuguese. Emphasis on listening comprehension and oral practice, the elements of grammar, vocabulary building, elementary readings. This is the third course in a sequence of three: Port 101, Port 102, and Port 103.

Port 199 - Special Studies (1-3)
(Credit to be arranged.)

Port 201 - Second-year Portuguese (4)
Intensive review of basic materials introduced in first-year program and further development of communication skills. This is the first course in a sequence of three: Port 201, Port 202, and Port 203. Recommended prerequisite: Port 103.

Port 202 - Second-year Portuguese (4)
Intensive review of basic materials introduced in first-year program and further development of communication skills. This is the second course in a sequence of three:

Port 203 - Second-year Portuguese (4)
Intensive review of basic materials introduced in first-year program and further development of communication skills. This is the third course in a sequence of three: Port 201, Port 202, and Port 203. Recommended prerequisite: Port 103.

Port 299 - Special Studies (1-12)
(Credit to be arranged.)

Port 301 - Third Year Portuguese (4)
Continued work on the Portuguese language. Port 301 emphasizes listening comprehension and speaking, 302 grammatical patterns, reading, and writing. May be taken concurrently. This is the first course in a sequence of two: Port 301 and Port 302. Recommended prerequisite: Port 203.

Port 302 - Third Year Portuguese (4)
Continued work on the Portuguese language. Port 301 emphasizes listening comprehension and speaking, 302 grammatical patterns, reading, and writing. May be taken concurrently. This is the second course in a sequence of two: Port 301 and Port 302. Recommended prerequisite: Port 203.

Port 399 - Special Studies (1-6)
(Credit to be arranged.)

Port 404 - Cooperative Education/Internship (1-12)
(Credit to be arranged.)

Port 409 - Practicum (1-8)
(Credit to be arranged.)

PS - Political Science
PS 101 - United States Government (4)
An examination is made of American government in theory and practice. Topics include: the constitutional foundations of American government; federalism, civil liberties, and civil rights; Congress and the legislative process; the presidency and modern bureaucracy; the Supreme Court and judicial policy-making.

PS 102 - United States Politics (4)
Introduction to issues and trends in political culture, political behavior, and public policy making. Topics include: public opinion, political parties and pressure groups, elections and voting behavior, political participation, the role of the media, policy making, the budget process, domestic policy, and national security policy.

PS 103 - State of the World (4)
The course surveys and analyzes the major global issues of our time, including human rights, environmental protection, poverty and underdevelopment, and war and peace. The importance of using interdisciplinary tools of analysis, and understanding the meaning of a global perspective on world affairs, are emphasized.

PS 199 - Special Studies (1-4)
(Credit to be arranged.) Consent of instructor.

PS 200 - Introduction to Politics (4)
Basic introduction to the central themes and fundamental issues of political life. Examines the nature and meaning of politics and political association in both domestic and international settings. Fundamental concepts and ideas associated with government, and politics more generally, are explored, along with the nature of political culture and the way this culture is reflected in the institutions and operations of government.

PS 203 - Introduction to State and Local Politics (4)
Provides an introduction to the role and structure of state and local governments, and examines the forces that influence subnational politics. Topics include federalism, intergovernmental relations, elections, the policy-making process, and the problems confronting states and communities.

PS 204 - Comparative Politics (4)
A general survey of theories, concepts, and methods employed in comparative politics. Attention given to political behavior, structures, and processes.

PS 205 - International Politics (4)
An analysis of the nature of relations among nations, with specific reference to
contemporary international issues. Motivating factors will be examined, including nationalism, economic rivalries, and the quest for security. Also treated will be the problem of national sovereignty and its relationship to international cooperation, changing threats to international security in the post-Cold War era, and the increasing importance of international economic competition and cooperation.

**PS 208 - Introduction to Political Theory (4)**

General introduction to the problems of political theory. A selective survey of the political ideas of Plato, Machiavelli, Locke, Rousseau, Mill, and Marx which introduced some of the major traditions of political thought in the west. The foundations of the communitarian, republican, and liberal political discourse are examined and discussed.

**PS 221 - Introduction to Law and Legal Studies (4)**

Introduction to the nature and function of public law in the United States. The course focuses on fundamental problems of jurisprudence, the relation between law and politics, the nature and function of the court system, judicial process, and the workings of the criminal justice system.

**PS 312 - Legislative Process (4)**

An examination of the role of legislatures in state politics. Particular attention is given to the forces that shape legislative elections, the relationship between legislatures and governors, and efforts to reform legislative politics. Recommended prerequisites: PS 101 and 102.

**PS 313 - The Power Game: A Simulation of Washington Politics (4)**

Examines the nature of political power, the complexities involved in policy-making, and the relationship between the major political actors in Washington, D.C. The course revolves around a simulation of the U.S. government in which students play the roles of real members of Congress, the executive branch, interest groups, and the press.

**PS 313U - The Power Game: A Simulation of Washington Politics (4)**

Examines the nature of political power, the complexities involved in policy-making, and the relationship between the major political actors in Washington, D.C. The course revolves around a simulation of the U.S. government in which students play the roles of real members of Congress, the executive branch, interest groups, and the press.

**PS 317 - Film and Politics (4)**

Examines the political meanings of films. Topics include: how films reflect, and sometimes challenge, basic themes in American political culture; how filmmakers capture and encode images in ways that tell a culturally-pleasing story; how audiences make sense of these images and stories to construct particular understanding of power, government, and the individual; and the relationship between Hollywood and politics.

**PS 317U - Film and Politics (4)**

Examines the political meanings of films. Topics include: how films reflect, and sometimes challenge, basic themes in American political culture; how filmmakers capture and encode images in ways that tell a culturally-pleasing story; how audiences make sense of these images and stories to construct particular understanding of power, government, and the individual; and the relationship between Hollywood and politics.

**PS 318 - Media, Opinion, and Voting (4)**

Course examines the interaction between the mass media, public opinion, and voting behavior in the United States. Competing theories of media effects on public opinion and voting behavior are analyzed, as are competing proposals for reforming electoral campaigns, campaign advertising, presidential debates, and other features of mass-mediated elections in order to enhance citizen participation. Key questions students will consider include the degree of responsibility that politicians, journalists, and citizens should assume for improving citizen engagement with electoral politics.

**PS 318U - Media, Opinion, and Voting (4)**

Course examines the interaction between the mass media, public opinion, and voting behavior in the United States. Competing theories of media effects on public opinion and voting behavior are analyzed, as are competing proposals for reforming electoral campaigns, campaign advertising, presidential debates, and other features of mass-mediated elections in order to enhance citizen participation. Key questions students will consider include the degree of responsibility that politicians, journalists, and citizens should assume for improving citizen engagement with electoral politics.

**PS 319 - Politics of the Environment (4)**

The human relationship with nature is a source of much political conflict and has been since the emergence of the state. This course explores the short- and long-term origins of current conflicts, the emergence of political movements around environmental issues, alternative world views regarding nature, and the distinctiveness of politics around these issues. Specific conflicts will be examined, including the relationship between human attempts to control nature and human hierarchies, population, water, and conservation of biodiversity.

**PS 325 - Politics and the Legal Enforcement of Morals (4)**

Critical examination of law as a mechanism for the enforcement of moral standards. The limits of law and political authority more generally are explored through an analysis of specific problem areas associated with the legal enforcement of morality. These include, but are not limited to: the use of criminal justice to enforce standards of conventional morality, political tolerance, civil disobedience, and the politics of law and order.

**PS 325U - Politics and the Legal Enforcement of Morals (4)**

Critical examination of law as a mechanism for the enforcement of moral standards. The limits of law and political authority more generally are explored through an analysis of specific problem areas associated with the legal enforcement of morality. These include, but are not limited to: the use of criminal justice to enforce standards of conventional morality, political tolerance, civil disobedience, and the politics of law and order. Recommended prerequisite: PS 221.

**PS 331 - Oregon Politics (4)**

An examination of political structures and policy trends in the state of Oregon. Attention is given to local governments as well as state government with special emphasis upon the relationships among different governmental entities.
PS 335 - Race and Politics in the United States (4)
Provides a general survey of constraints and opportunities in American racial minority politics against the backdrop of tremendous demographic change since 1965. Explores a series of debates in American politics with an eye toward the political implications of the changing demographic mix.

PS 343 - Politics of War (4)
Introduction to the theory and practice of both inter-state war and civil conflict with particular attention to levels of analysis as well as the process and consequences of war.

PS 345 - U.S. Foreign Policy: The Cold War and Beyond (4)
Analysis of the U.S. foreign policy process, its motives, objectives, and manner of implementation, in the major developments of each administration since 1945. Emphasis is on U.S. relations with the U.S.S.R/Russia and the Third World. Recommended prerequisite: PS 205.

PS 352 - Introduction to European Politics (4)
An introduction to the political systems and politics of countries in both western and eastern Europe. Includes analysis of institutions, policies, and political behavior, as well as an examination of the roles of culture and history. Both theory and case studies will be presented, and in addition, analysis of European integration.

PS 352U - Introduction to European Politics (4)
An introduction to the political systems and politics of countries in both western and eastern Europe. Includes analysis of institutions, policies, and political behavior, as well as an examination of the roles of culture and history. Both theory and case studies will be presented, and in addition, analysis of European integration.

PS 353 - Introduction to Latin American Politics (4)
An examination of a number of Latin American countries (Argentina, Chile, Brazil, Mexico, Peru, etc.) in comparative perspective. Topics covered include: the emergence of various social classes, class coalition and the impact of both of these on the state; the importance of international factors such as the international economy and the United States.

PS 353U - Introduction to Latin American Politics (4)
An examination of a number of Latin American countries (Argentina, Chile, Brazil, Mexico, Peru, etc.) in comparative perspective. Topics covered include: the emergence and decline of various regime types within each of these nation-states; the role of the state, various state sectors, state autonomy and state capacity; the emergence of various social classes, class coalition and the impact of both of these on the state; the importance of international factors such as the international economy and the United States.

PS 354 - Introduction to Asian Politics (4)
Introduction to the policies, institutions, and processes of the politics of Northeast and Southeast Asia.

PS 355 - Introduction to African Politics (4)
Introduction to the policies, institutions, and processes of the politics of Sub-Saharan Africa.

PS 355U - Introduction to African Politics (4)
Introduction to the policies, institutions, and processes of the politics of Sub-Saharan Africa.

PS 361 - Introduction to the Politics of the Middle East (4)
Introduction to Middle Eastern political systems. Focus will be on the nature of traditional politics, modernization and political development in the region, social stratification, institutions of government, and the political systems of selected Middle East countries.

PS 361U - Introduction to the Politics of the Middle East (4)
Introduction to Middle Eastern political systems. Focus will be on the nature of traditional politics, modernization and political development in the region, social stratification, institutions of government, and the political systems of selected Middle East countries. Recommended prerequisite: PS 204 or 205.

PS 362 - Arab-Israeli Conflict (4)
Examination of the conflicting ideological perspectives, the formation of the state of Israel, rise of Arab nationalism, emergence of Palestinian nationalism, the Arab-Israeli wars, rise of Palestinian activism, diplomatic efforts at partial settlements, and possibilities of a comprehensive settlement. Special attention is given to those elements opposed to a final settlement of the conflict, both within Israel and among the Palestinian and greater Arab communities.

PS 362U - Arab-Israeli Conflict (4)
Examination of the conflicting ideological perspectives, the formation of the state of Israel, rise of Arab nationalism, emergence of Palestinian nationalism, the Arab-Israeli wars, rise of Palestinian activism, diplomatic efforts at partial settlements, and possibilities of a comprehensive settlement. Special attention is given to those elements opposed to a final settlement of the conflict, both within Israel and among the Palestinian and greater Arab communities. Recommended prerequisite: PS 204, 205, or 361.

PS 371 - War and Morality (4)
Examines the limits observed by states in their resort to war and in the conduct of battle. Surveys the historical, moral, and legal foundations of these limits, and their enduring relevance in light of changes in international conflict and modern warfare. Topics include aggression and self-defense, preemption, humanitarian intervention, terrorism, torture, and war crimes.

PS 380 - Women and Politics (4)
Analysis of the political role of women in politics. Reviews the historical and contemporary analyses of women’s participation and status in politics.

PS 380U - Women and Politics (4)
Analysis of the political role of women in politics. Reviews the historical and contemporary analyses of women’s participation and status in politics. Recommended prerequisite: PS 101 or 102.

PS 387 - Politics and Fiction (4)
This course explores various themes associated with politics as they are presented in fictional media. The course integrates traditional academic material with
novels, film, television, poetry, etc., in order to expand student awareness of politics and public life. Recommended prerequisite: PS 200.

PS 389 - Environmental Political Theory (4)
Examines the conceptual and normative issues surrounding the politics of the environment, including the understanding of environmental problems suggested by various theoretical frameworks, including democratic theory, economic rationalism, sustainability, and green radicalism. Issues discussed include the idea of nature in the history of political thought, climate change, and animal rights.

PS 399 - Special Studies (1-6)
(Credit to be arranged.)

PS 399U - Special Studies (4)
(Credit to be arranged.)

PS 401 - Research (1-6)
(Credit to be arranged.) Consent of instructor.

PS 403 - Honors Thesis (1-12)
(Credit to be arranged.) Consent of instructor.

PS 404 - Cooperative Education/Internship (1-12)
(Credit to be arranged.)

PS 405 - Reading and Conference (1-6)
(Credit to be arranged.)

PS 407 - Seminar (1-6)
(Credit to be arranged.) Reading and discussion about an area of political science, with a research project required. Enrollment limited.

PS 407H - Seminar (1-6)
Contact the department for a description of this course.

PS 408 - Workshop (1-4)
(Credit to be arranged.)

PS 409 - Practicum (1-12)
(Credit to be arranged.) Consent of instructor.

PS 410 - Selected Topics (1-6)
(Credit to be arranged.) Consent of instructor.

PS 410U - Selected Topics (1-4)
(Credit to be arranged.)

PS 412 - The Presidency (4)
Analysis of the institution, functions, and problems of the presidency. Special attention given to presidential elections, presidential powers, relations with media, presidential leadership. White House staff, executive-legislative relations, and the presidential role in domestic, economic, foreign policy making and execution. Also offered for graduate-level credit as PS 512 and may be taken only once for credit. Expected preparation: PS 101 and PS 102.

PS 413 - Congress (4)
Study of the structure, organization, powers and operations of Congress. Topics covered include: the evolution of Congress, congressional recruitment and elections, legislative functions, the membership, the leaders, the committee system, the rules and procedures, executive-legislative relations, pressure groups, lobbying, and reform. Also offered for graduate-level credit as PS 513 and may be taken only once for credit. Expected preparation: PS 101 and PS 102.

PS 414 - Issues in Public Policy (4)
A study of selected major policies and programs of governmental regulation and service. Emphasis is placed upon the formation, administration, and substantive content of policies in such areas as transportation, public utility regulation, medical care, civil rights, education, agriculture, natural resources, and antitrust laws and the preservation of competition. Also offered for graduate-level credit as PS 514 and may be taken only once for credit. Expected preparation: PS 215.

PS 415 - Comparative Public Policy (4)
Introduction to theories, methods, and cases in comparative public policy. Emphasis on policy learning and applied comparative policy analysis. Unique and shared characteristics of policies in different countries or regions. Topics may include welfare and environmental policy. Also offered for graduate-level credit as PS 515 and may be taken only once for credit. Prerequisite: upper-division standing.

PS 416 - Political Parties and Elections (4)
An examination of political parties and elections in America. Covers such topics as: the changing role of party organizations, machine politics, electoral rules, candidate recruitment, the nomination process, campaign strategies and tactics, campaign finance, and electoral reform. Also offered for graduate-level credit as PS 516 and may be taken only once for credit. Expected preparation: PS 101 and 102.

PS 417 - Interest Groups (4)
This course analyzes the role of interest groups in the political process. Particular attention is given to why some interests are more successful at forming groups and influencing politics than others. The course also examines techniques used to lobby legislatures, the executive branch, and the courts. Also offered for graduate-level credit as PS 517 and may be taken only once for credit. Expected preparation: PS 101 and PS 102.

PS 418 - Contemporary Political Protest in America (4)
Analyzes the role of social movements in recent American history. The course blends theoretical readings with empirical research into specific movements. Movements considered include but are not limited to: civil rights, the new left, public interest reform, the freeze movement, the women’s movement, the Christian Right, and the paramilitary/skinhead movement. Also offered for graduate-level credit as PS 518 and may be taken only once for credit.

PS 419 - Political Reform (4)
Examines the concerns that drive the demand for political reform in America, and how specific reform proposals may affect the political system. The first part of the course focuses on a variety of proposals to open up the electoral system and to improve representation. The second part examines various reforms that are designed to make the government work more effectively and efficiently. Also offered for graduate-level credit as PS 519 and may be taken only once for credit.

PS 421 - The Supreme Court and American Politics (4)
Uses selective case law in order to explore the place of the Supreme Court in America’s
constitutional structure and its interpretation of the relationship between the branches of federal government. Examines the way the Court forms and shapes policy through constitutional interpretation, and the way political forces and influences shape Court practices, judicial selection, and the decision-making process. Also offered for graduate-level credit as PS 521 and may be taken only once for credit.

**PS 422 - Constitutional Law (4)**

A study of the way in which the Supreme Court has shaped and influenced governmental structure and political power. Special attention is given to judicial decisions in the areas of federalism, separation of powers, the commerce clause, and the authority of the presidency. Also offered for graduate-level credit as PS 522 and may be taken only once for credit. Expected preparation: PS 321.

**PS 423 - Civil Liberties (4)**

A study of Supreme Court decisions that affect individual rights and liberties. Areas of concentration include, but are not limited to, freedom of speech and press, religious liberty, criminal justice, racial justice, gender justice, and the right to privacy. Also offered for graduate-level credit as PS 523 and may be taken only once for credit. Expected preparation: PS 321 or PS 221.

**PS 424 - Law, Politics, and Society (4)**

Examines connection between law and the society which creates and enforces it. Law will be studied from bottom up rather than top down. Emphasis placed on what law is, how people use law, including whethehr access to law is equal, and how the state exercises power through law. Also offered for graduate-level credit as PS 524 and may be taken only once for credit. Expected preparation: PS 221.

**PS 425 - Women and the Law (4)**

Examines the relationship between women and the law. The first half of the course considers several theories of women's equality. During the second half of the course students will apply these theories to a variety of problems in gender justice. Substantive issues covered may include: sexual harassment, abortion, fetal protection policies, and pornography. Also offered for graduate-level credit as PS 525; this course is the same as WS 424; course may be taken only once for credit.

Crosslisted as: WS 424.

**PS 426 - The Politics of the News (4)**

Explores the role of the news media in political life and the political and economic forces shaping the news. Examines the purposes and functions of mass media in a democracy, the legal and economic structure of the American media, and the journalistic practices and communications strategies that contribute to news coverage of politics. Also offered for graduate-level credit as PS 526 and may be taken only once for credit.

**PS 427 - The Politics of Public Opinion (4)**

Course provides students with solid foundations for understanding the nature and evaluating the role of public opinion in American democracy. It will also teach students how to interpret public opinion polls intelligently. Specific topics covered will include how "public opinion" has been defined historically and in contemporary discourse; the various influences that shape peoples' values, beliefs, and attitudes about politics; the methods that pollsters and survey researchers use to measure public opinion and problems with those methods; and the content of Americans' views on controversial political issues. Also offered for graduate-level credit as PS 527 and may be taken only once for credit. Expected preparation: PS 318.

**PS 428 - The Politics of Law and Order (4)**

As American crime control policies have become increasingly punitive, the criminal justice system has expanded in size and scope, crime control has become increasingly federalized, and record numbers of Americans have been incarcerated. Class explores what is political about crime control and why American crime policy takes on a particularly punitive cast. In particular, carefully examines the social construction of the crime problem: how popular beliefs about criminals and the causes of crime interact with the media and the political system to create a style of crime policy that is uniquely American. Also offered for graduate-level credit as PS 528 and may be taken only once for credit. Expected preparation: PS 221.

**PS 431 - State and Local Politics (4)**

Intensive examination of the role of the states and cities in the federal system. The course pays particular attention to the importance of political culture in shaping state politics and power relationships between the different levels and branches of government. Oregon's political experiences are used as example and for comparison. Also offered for graduate-level credit as PS 531 and may be taken only once for credit. Expected preparation: PS 203.

**PS 432 - Great Tribal Leaders (4)**

Course is based on videotaped interviews with contemporary American Indian leaders discussing the personal and social forces that shaped them and the roles they played in shaping federal Indian policy, law, and natural resource management. Key areas of study include historic eras of federal Indian policy; the exercise of power by federal legislative, judicial, and executive branches and their affects on tribal lives and societies; the continuing survival of tribes; and the evolution of tribal governments to meet unforeseen and overwhelming challenges. Recommended prerequisite: PS 101.

**PS 435 - Disasters and Public Policy (4)**

The political, administrative, and public policy issues surrounding major and catastrophic risks and disasters including both natural (earthquakes, pandemics, asteroids) and man-made (climate change, nuclear weapons, bio-terrorism) events. Also offered for graduate-level credit as PS 535 and may be taken only once for credit. Expected preparation: PS 101, PS 102, or PS 200.

**PS 441 - World Politics (4)**

This course introduces students to the various levels of analysis used in explaining world political events. Examined are a number of conceptual elements of world politics, e.g., power, interdependence, integration, and levels of analysis, as well as certain substantive elements, e.g., international law and organization. Contrasts are drawn between power seeking and order-seeking behaviors of nation states. Also offered for graduate-level credit as PS 541 and may be taken only once for credit. Expected preparation: PS 205.
PS 442 - Contemporary Theories of World Politics (4)

Surveys concepts and arguments from various theoretical traditions in international relations. Topics are drawn from the ongoing debate between the realist and liberal schools of thought, as well as the challenges posed by radical, normative, and critical international relations theory. Theories will be examined mainly for their insights on issues of war and peace. Also offered for graduate-level credit as PS 542 and may be taken only once for credit. Expected preparation: PS 441.

PS 444 - National Security Strategy: Regional Perspectives (4)

Focuses on the regional contexts that influence U.S. national security strategy and the multifaceted reasons security polices succeed or fail in each region of the world. Critical analysis applied to major social, cultural, political, economic, military, technological, and historical issues that shape formation of regional security strategy, and to strategic assessments of U.S. security policies as perceived from other regions' perspectives. Also offered for graduate-level credit as PS 544 and may be taken only once for credit. Expected preparation: PS 205.

PS 446 - National and International Security Policies (4)

A comparison of national and international security systems, strategies, and policies. Emphasis will be on the current issues arising in these security systems and on the problems that arise when their needs conflict. Particular emphasis will be placed on contending theories of national and international security. Also offered for graduate-level credit as PS 546 and may be taken only once for credit. Expected preparation: PS 205 or PS 441.

PS 447 - International Organization (4)

The nature and extent of the organization of interaction among nations. Focus on the United Nations, but illustrations and generalization from a wide range of regional and functional organizations including the specialized agencies. Emphasis on the processes of communication, interaction, and negotiation within the organizational environment. Also offered for graduate-level credit as PS 547 and may be taken only once for credit.

PS 448 - International Law (4)

Introduction to public international law. Particular emphasis is placed on the interplay of politics and law in the international system. Types of law, sources of law, law creating agencies, law applying agencies are considered. Contemporary substantive issues in international law will be discussed. Also offered for graduate-level credit as PS 548 and may be taken only once for credit. Expected preparation: PS 205 or PS 441.

PS 449 - International Environmental Politics and Law (4)

Explores various environmental problems and issue areas that exist between and among nation-states. There will be an exploration of the political difficulties that impede solutions and the various pathways that may lead to environmental cooperation. There will also be a focus on the international legal regimes and international institutions designed to regulate environmental problems. Also offered for graduate-level credit as PS 549 and may be taken only once for credit.

PS 452 - The European Union (4)

Focuses on how the EU has evolved since its beginnings in the 1950s, on its present-day organization and functions, and on how the member countries interact with one another in making EU policies for jointly regulating their internal economies and societies as well as their external policies, i.e., how the EU members also try to manage their relations with the rest of the world. Also offered for graduate-level credit as PS 552; this course is the same as Intl 452; course may only be taken once for credit.

PS 453 - Power Transitions: Past, Present, and Future (4)

Uses power transition theory to examine what elements contribute to global war. Creates a foundation for understanding why nations fight, when they fight, the outcome of wars, and the relationship between global and regional conflicts. Also explores the continuum of peaceful interactions at the global level, and how and when the next series of upheavals will occur in the international system. Also offered for graduate-level credit as PS 553 and may be taken only once for credit. Expected preparation: PS 205.

PS 454 - International Political Economy (4)

A study of the contending theories of international political economy: power and interdependence, Regime Theory, dependency, integration, and functionalism, as well as the ideologies of political economy—the liberal, national, and Marxist perspectives. Also considered are the politics of trade, aid, and investment. Also offered for graduate-level credit as PS 554 and may be taken only once for credit. Expected preparation: PS 205 or PS 441.

PS 455 - Politics of Economic Reform in Emerging Market Countries (4)

Explores the process of economic reform in a comparative and international setting by focusing on emerging market countries (e.g., Argentina, Brazil, Mexico, Indonesia, Poland, Turkey, and Thailand). Designed to give a more in-depth analysis of reform policies for the students. Also offered for graduate-level credit as PS 555 and may be taken only once for credit. Expected preparation: PS 454/554.

PS 460 - Political Development in Modern Turkey (4)

Designed to provide students with an in-depth study of political development literature with a focus on modern Turkey. Examines how modern Turkish republic emerged from the ashes of the Ottoman Empire and evaluate stages of political development during the first, second, and third republic. Finally, assesses the implications of Turkey’s new geopolitics (since the end of the Cold War) on Turkish political and economic development in a global perspective. Also offered for graduate-level credit as PS 560; this course is the same as Intl 460 and may only be taken once for credit.

PS 461 - Politics of Economic Reform in Modern Turkey (4)

This course is designed to provide students with an in depth study of political development literature with a focus on modern Turkey. We will examine how modern Turkish republic emerged from the ashes of the Ottoman Empire and evaluate stages of economic development during the first, second, and third republic. Finally, we will assess the implications of Turkey’s new geopolitics (since the end of the Cold War) on Turkish economic development in a global perspective. Also offered for
graduate-level credit as PS 561; this course is cross-listed as Intl 461/561; may only be taken once for credit.

PS 462 - International Relations of the Middle East (4)
Examination of the external dimension of Middle East politics; the role of the great powers; brief analysis of the British and French roles since 1945; extended analysis of American and Soviet/Russian policy in the Middle East. Special attention will be given to new patterns of international relations in the Middle East in the post-Cold War, post-Gulf War era. Also offered for graduate-level credit as PS 562 and may be taken only once for credit. Expected preparation: PS 361.

PS 466 - Politics of China (4)
A survey of the historical, institutional, and social roots of contemporary politics in China as well as a consideration of several public policy areas. Also offered for graduate-level credit as PS 566 and may be taken only once for credit.

PS 468 - International Politics of East Asia (4)
Examination of the foreign policy motives, objectives, and systems of the major East Asian states: China, Japan, and Korea. Attention is paid in particular to the political economy of regional and extra-regional relationships. Also offered for graduate-level credit as PS 568 and may be taken only once for credit.

PS 470 - Theories of Comparative Politics (4)
Examines the evolution of the theories and methods of comparative politics, addressing both the recent history of the discipline and the current state of its practices. Topics include: the behavioral revolution, political development, the role of state, the new institutionalism, and the state-in-society approaches. Also offered for graduate-level credit as PS 570 and may be taken only once for credit. Expected preparation: PS 204.

PS 471 - Gender & Politics: A Comparative Perspective (4)
Examination of the role, progress, behavior, and power of women in politics using a comparative lens. Topics include the representation of women in government, the problems confronting female candidates, the behavior of women officeholders, and the gender gap in politics. Examines women in western democracies, as well as in communist states and developing nations. Individual countries are used as case studies. Also offered for graduate-level credit as PS 571 and may be taken only once for credit. Expected preparation: PS 200 and junior standing.

PS 472 - Democratization and Authoritarianism in the Middle East and North Africa (4)
Introduction to theoretical, empirical, and methodological debates in the comparative and international relations of the Middle East. Examination of contemporary political, economic, and social topics, including institutions and regimes, political economy, women and politics, Israeli-Palestinian conflict, and regional and international affairs. Also offered for graduate-level credit as PS 572 and may be taken only once for credit.

Prerequisite: Upper-division standing.

PS 473 - Government and Politics of Arab North Africa (4)
Examines the domestic and international politics of Arab North Africa, including Morocco, the Moroccan/Western Sahara, Mauritania, Algeria, Tunisia, Libya, and Egypt. Topics include the history of the region, political regimes and authoritarianism, the Arab spring, women’s rights, and U.S.-Maghrebi relations. Also offered for graduate-level credit as PS 573 and may be taken only once for credit.

Prerequisite: upper-division standing.

PS 474 - Democracy and Development in Latin America (4)
Examines issues of democracy and development in Latin America. It addresses such topics as the role of history, political culture, political leadership, political institutions, the state, the military, civil society, social classes, level of socioeconomic development, and their relationship to the possibilities of success or failure for democracy in Latin America. The course examines specific cases such as Argentina, Brazil, Mexico, Chile, Peru, Venezuela, and Uruguay. Also offered for graduate-level credit as PS 574 and may be taken only once for credit. Expected preparation: PS 353.

PS 478 - Comparative Democratic Institutions (4)
Examines differences in how democratic governments are structured across the globe and what these differences mean for governing. Explores differences both among and between presidential, parliamentary, and semi-presidential political systems. Examines federal and unitary political structures, and the role of supreme courts. Field trip to observe alternative democratic system. Also offered for graduate-level credit as PS 578 and may be taken only once for credit.

Prerequisite: Upper-division standing.

PS 479 - Transitions to Democracy (4)
Comparative analysis of political systems which have experienced a transition from an authoritarian to a democratic regime. Attention is given to the conditions supportive of democratic transition and to the problems of maintaining democratic stability. Also offered for graduate-level credit as PS 579 and may be taken only once for credit. Expected preparation: PS 204.

PS 481 - Democratic Theory (4)
Critical examination of the principles of democratic politics, including important statements in the history of political thought and contemporary political theory. Issues discussed include participation, deliberation, electoral competition, constitutionalism, and the challenges of democratic legitimacy in the context of US institutions and increasing globalization. Also offered for graduate-level credit as PS 581 and may be taken only once for credit.

Prerequisite: sophomore standing or higher.

PS 482 - Liberalism and Its Critics (4)
Critical examination of the theory and practice of liberalism as an ongoing tradition. The basic elements of liberalism are identified and discussed and criticisms of the liberal tradition, as offered by communitarians, classical republicans, feminists, and postmodernists, are examined. Liberal responses to these criticisms are also explored. Also offered for graduate-level credit as PS 582 and may be taken only once for credit. Expected preparation: PS 381.
PS 483 - Justice in the Modern World (4)
Critical analysis of the nature and meaning of social justice. Special attention is given to liberal theories of justice, questions of distributive justice, justice and the rule of law, inter-generational justice, and political alternatives to the liberal vision of social justice. Also offered for graduate-level credit as PS 583 and may be taken only once for credit. Expected preparation: PS 381.

PS 486 - American Political Thought: 1600 to 1820 (4)
The development from 1600 to 1820 of American political thought about government and its proper relation to the individual and society. Specific topics considered include the English background; the colonial mind; ideas informing the revolution; the creation of the Constitution; and the ratification debates; the Jeffersonian and Hamiltonian conflict; John Marshall and the expansion of national power. Attention given to bringing to the surface the fundamental, often inarticulate, patterns, and presuppositions of American thought about political things. Also offered for graduate-level credit as PS 586 and may be taken only once for credit.

PS 487 - American Political Culture: 1820 to the Present (4)
The development from 1820 to the present of American political thought about government and its proper relation to life, liberty, property and the pursuit of happiness. Topics considered include democratization and the Jacksonian period, slavery, and the nature of the Union, Social Darwinism and industrialization, the progressive period, the coming of the welfare state, and contemporary concerns. Attention given to bringing to the surface the fundamental, often inarticulate, patterns, and presuppositions of American thought about political things. Also offered for graduate-level credit as PS 587 and may be taken only once for credit.

PS 493 - Philosophy of the Social Sciences (4)
An analysis of the practical challenges and competing approaches to the practice of social science, especially political science. Subjects considered include the aims of social science, concepts and description, causality, rationality, macro and micro explanations, interpretation, and postmodernism. Also offered for graduate-level credit as PS 593 and may be taken only once for credit.

PS 495 - Research Methods for Political Science (4)
Introduction to an examination of methodological issues and statistical techniques for empirical political research. Major topics include but are not limited to issues in designing political research, survey research, the role of hypothesis testing, and the major statistical tools commonly employed in empirical political analysis. Also offered for graduate-level credit as PS 595 and may be taken only once for credit. Expected preparation: Mth 243, Mth 244.

PS 501 - Research (1-9)
(Credit to be arranged.) Consent of instructor.

PS 503 - Thesis (1-9)
(Credit to be arranged.) Pass/no pass option.

PS 504 - Cooperative Education/Internship (1-9)
(Credit to be arranged.) Consent of instructor.

PS 505 - Reading and Conference (1-12)
(Credit to be arranged.) Consent of instructor.

PS 507 - Seminar (1-6)
(Credit to be arranged.) Reading and discussion about an area of political science, with a research project required. Enrollment limited.

PS 509 - Practicum (1-9)
(Credit to be arranged.) Consent of instructor.

PS 510 - Selected Topics (1-6)
(Credit to be arranged.) Consent of instructor.

PS 512 - The Presidency (4)
Analysis of the institution, functions, and problems of the presidency. Special attention given to presidential elections, presidential powers, relations with media, presidential leadership. White House staff, executive-legislative relations, and the presidential role in domestic, economic, foreign policy making and execution. Also offered for undergraduate-level credit as PS 412 and may be taken only once for credit. Expected preparation: PS 101 and PS 102.

PS 513 - Congress (4)
Study of the structure, organization, powers and operations of Congress. Topics covered include: the evolution of Congress, congressional recruitment and elections, legislative functions, the membership, the leaders, the committee system, the rules and procedures, executive-legislative relations, pressure groups, lobbying, and reform. Also offered for undergraduate-level credit as PS 413 and may be taken only once for credit. Expected preparation: PS 101 and PS 102.

PS 514 - Issues in Public Policy (4)
A study of selected major policies and programs of governmental regulation and service. Emphasis is placed upon the formulation, administration, and substantive content of policies in such areas as transportation, public utility regulation, medical care, civil rights, education, agriculture, natural resources, and antitrust laws and the preservation of competition. Also offered for undergraduate-level credit as PS 414 and may be taken only once for credit. Expected preparation: PS 215.

PS 515 - Comparative Public Policy (4)
Introduction to theories, methods, and cases in comparative public policy. Emphasis on policy learning and applied comparative policy analysis. Unique and shared characteristics of policies in different countries or regions. Topics may include welfare and environmental policy. Also offered for undergraduate-level credit as PS 415 and may be taken only once for credit. Prerequisite: upper-division standing.

PS 516 - Political Parties and Elections (4)
An examination of political parties and elections in America. Covers such topics as: the changing role of party organizations, machine politics, electoral rules, candidate recruitment, the nomination process, campaign strategies and tactics, campaign finance, and electoral reform. Also offered for undergraduate-level credit as PS 416 and may be taken only once for credit. Expected preparation: PS 101 and PS 102.

PS 517 - Interest Groups (4)
This course analyzes the role of interest groups in the political process. Particular attention is given to why some interests are more successful at forming groups and
influencing politics than others. The course also examines techniques used to lobby legislatures, the executive branch, and the courts. Also offered for undergraduate-level credit as PS 417 and may be taken only once for credit. Expected preparation: PS 101 and PS 102.

PS 518 - Contemporary Political Protest in America (4)

Analyzes the role of social movements in recent American history. The course blends theoretical readings with empirical research into specific movements. Movements considered include but are not limited to: civil rights, the new left, public interest reform, the freeze movement, the women's movement, the Christian Right, and the paramilitary/skinhead movement. Also offered for undergraduate-level credit as PS 418 and may be taken only once for credit.

PS 519 - Political Reform (4)

Examines the concerns that drive the demand for political reform in America, and how specific reform proposals may affect the political system. The first part of the course focuses on a variety of proposals to open up the electoral system and to improve representation. The second part examines various reforms that are designed to make the government work more effectively and efficiently. Also offered for undergraduate-level credit as PS 419 and may be taken only once for credit.

PS 520 - Seminar on American Political Institutions (4)

Introduction to the field of American Politics, with a particular focus on American political institutions and their respective sub-fields within the discipline of political science.

PS 521 - The Supreme Court and American Politics (4)

Uses selective case law in order to explore the place of the Supreme Court in America's constitutional structure and its interpretation of the relationship between the branches of federal government. Examines the way the Court forms and shapes policy through constitutional interpretation, and the way political forces and influences shape Court practices, judicial selection, and the decision-making process. Also offered for undergraduate-level credit as PS 421 and may be taken only once for credit.

PS 522 - Constitutional Law (4)

A study of the way in which the Supreme Court has shaped and influenced governmental structure and political power. Special attention is given to judicial decisions in the areas of federalism, separation of powers, the commerce clause, and the authority of the presidency. Also offered for undergraduate-level credit as PS 422 and may be taken only once for credit. Expected preparation: PS 321.

PS 523 - Civil Liberties (4)

A study of Supreme Court decisions that affect individual rights and liberties. Areas of concentration include, but are not limited to, freedom of speech and press, religious liberty, criminal justice, racial justice, gender justice, and the right to privacy. Also offered for undergraduate-level credit as PS 423 and may be taken only once for credit. Expected preparation: PS 321 or PS 221.

PS 524 - Law, Politics, and Society (4)

Examines connection between law and the society which creates and enforces it. Law will be studied from bottom up rather than top down. Emphasis placed on what law is, how people use law, including whether access to law is equal, and how the state exercises power through law. Also offered for undergraduate-level credit as PS 424 and may be taken only once for credit. Expected preparation: PS 221.

PS 525 - Women and the Law (4)

Examines the relationship between women and the law. The first half of the course considers several theories of women's equality. During the second half of the course students will apply these theories to a variety of problems in gender justice. Substantive issues covered may include: sexual harassment, abortion, fetal protection policies, and pornography. Also offered for undergraduate-level credit as PS 425; this course is the same as WS 424; course may be taken only once for credit. Crosslisted as: WS 424.

PS 526 - The Politics of the News (4)

Explores the role of the news media in political life and the political and economic forces shaping the news. Examines the purposes and functions of mass media in a democracy, the legal and economic structure of the American media, and the journalistic practices and communications strategies that contribute to news coverage of politics. Also offered for undergraduate-level credit as PS 426 and may be taken only once for credit.

PS 527 - The Politics of Public Opinion (4)

Course provides students with solid foundations for understanding the nature and evaluating the role of public opinion in American democracy. It will also teach students how to interpret public opinion polls intelligently. Specific topics covered will include how "public opinion" has been defined historically and in contemporary discourse; the various influences that shape peoples' values, beliefs, and attitudes about politics; the methods that pollsters and survey researchers use to measure public opinion and problems with those methods; and the content of Americans' views on controversial political issues. Also offered for undergraduate-level credit as PS 427 and may be taken only once for credit. Expected preparation: PS 318.

PS 528 - The Politics of Law and Order (4)

As American crime control policies have become increasingly punitive, the criminal justice system has expanded in size and scope, crime control has become increasingly federalized, and record numbers of Americans have been incarcerated. Class explores what is political about crime control and why American crime policy takes on a particularly punitive cast. In particular, carefully examines the social construction of the crime problem: how popular beliefs about criminals and the causes of crime interact with the media and the political system to create a style of crime policy that is uniquely American. Also offered for undergraduate-level credit as PS 428 and may be taken only once for credit. Expected preparation: PS 221.

PS 530 - Proseminar in International Relations (4)

Graduate seminar surveys the main theoretical and analytical approaches encountered in the study of international relations. Themes include the grand theoretical traditions of liberalism, realism, and radicalism; analytical and methodological perspectives, like behavioralism and rational choice theory; as well as the normative, critical, and postmodern challenges to the mainstream.
PS 511 - State and Local Politics (4)
Intensive examination of the role of the states and cities in the federal system. The course pays particular attention to the importance of political culture in shaping state politics and power relationships between the different levels and branches of government. Oregon’s experiences are used as examples and for comparison. Also offered for undergraduate-level credit as PS 431 and may be taken only once for credit. Expected preparation: PS 203.

PS 535 - Disasters and Public Policy (4)
The political, administrative, and public policy issues surrounding natural and catastrophic risks and disasters including both natural (earthquakes, pandemics, asteroids) and man-made (climate change, nuclear weapons, bio-terrorism) events. Also offered for undergraduate-level credit as PS 435 and may be taken only once for credit. Expected preparation: PS 101, PS 102, or PS 200.

PS 541 - World Politics (4)
This course introduces students to the various levels of analysis used in explaining world political events. Examined are a number of conceptual elements of world politics, e.g., power, interdependence, integration, and levels of analysis, as well as certain substantive elements, e.g., international law and organization. Contrasts are drawn between power seeking and order-seeking behaviors of nation states. Also offered for undergraduate-level credit as PS 441 and may be taken only once for credit. Expected preparation: PS 205.

PS 542 - Contemporary Theories of World Politics (4)
Surveys concepts and arguments from various theoretical traditions in international relations. Topics are drawn from the ongoing debate between the realist and liberal schools of thought, as well as the challenges posed by radical, normative, and critical international relations theory. Theories will be examined mainly for their insights on issues of war and peace. Also offered for undergraduate-level credit as PS 442 and may be taken only once for credit. Expected preparation: PS 441.

PS 543 - Resolving International Conflicts (4)
A seminar that explores different kinds of international disputes and actual conflicts in order to identify and assess theories, analytical frameworks, and methods of conflict resolution, management, and prevention. Emphasis is on understanding the roots of conflicts and techniques that may be appropriate to different levels and dimensions of conflict.

PS 544 - National Security Strategy: Regional Perspectives (4)
Focuses on the regional contexts that influence U.S. national security strategy and the multifaceted reasons security policies succeed or fail in each region of the world. Critical analysis applied to major social, cultural, political, economic, military, technological, and historical issues that shape formation of regional security strategy, and to strategic assessments of U.S. security policies as perceived from other regions’ perspectives. Also offered for undergraduate-level credit as PS 444 and may be taken only once for credit. Expected preparation: PS 205.

PS 545 - American Foreign Policy (4)
Contemporary foreign relations of the United States; objectives, world, and domestic factors affecting American foreign policy; governmental institutions concerned with development and execution of foreign policy; major issues and problems.

PS 546 - National and International Security Policies (4)
A comparison of national and international security systems, strategies, and policies. Emphasis will be on the current issues arising in these security systems and on the problems that arise when their needs conflict. Particular emphasis will be placed on contending theories of national and international security. Also offered for undergraduate-level credit as PS 446 and may be taken only once for credit. Expected preparation: PS 205 or PS 441.

PS 547 - International Organization (4)
The nature and extent of the organization of interaction among nations. Focus on the United Nations, but illustrations and generalization from a wide range of regional and functional organizations including the specialized agencies. Emphasis on the processes of communication, interaction, and negotiation within the organizational environment. Also offered for undergraduate-level credit as PS 447 and may be taken only once for credit.

PS 548 - International Law (4)
Introduction to public international law. Particular emphasis is placed on the interplay of politics and law in the international system. Types of law, sources of law, law creating agencies, law applying agencies are considered. Contemporary substantive issues in international law will be discussed. Also offered for undergraduate-level credit as PS 448 and may be taken only once for credit. Expected preparation: PS 205 or PS 441.

PS 549 - International Environmental Politics and Law (4)
Explores various environmental problems and issue areas that exist between and among nation-states. There will be an exploration of the political difficulties that impede solutions and the various pathways that may lead to environmental cooperation. There will also be a focus on the international legal regimes and international institutions designed to regulate environmental problems. Also offered for undergraduate-level credit as PS 449 and may be taken only once for credit.

PS 552 - The European Union (4)
Focuses on how the EU has evolved since its beginnings in the 1950s, on its present-day organization and functions, and on how the member countries interact with one another in making EU policies for jointly regulating their internal economies and societies as well as their external policies, i.e., how the EU members also try to manage their relations with the rest of the world. Also offered for undergraduate-level credit as PS 452; this course is the same as Intl 452; course may only be taken once for credit. Crosslisted as: Intl 452.

PS 553 - Power Transitions: Past, Present, and Future (4)
Uses power transition theory to examine what elements contribute to global war. Creates a foundation for understanding why nations fight, when they fight, the outcome of wars, and the relationship between global and regional conflicts. Also explores the
continuum of peaceful interactions at the global level, and how and when the next series of upheavals will occur in the international system. Also offered for undergraduate-level credit as PS 453 and may be taken only once for credit. Expected preparation: PS 205.

PS 554 - International Political Economy (4)
A study of the contending theories of international political economy: power and interdependence, Regime Theory, dependency, integration, and functionalism, as well as the ideologies of political economy—the liberal, national, and Marxist perspectives. Also considered are the politics of trade, aid, and investment. Also offered for undergraduate-level credit as PS 454 and may be taken only once for credit. Expected preparation: PS 205 or PS 441.

PS 555 - Politics of Economic Reform in Emerging Market Countries (4)
Explores the process of economic reform in a comparative and international setting by focusing on emerging market countries (e.g., Argentina, Brazil, Mexico, Indonesia, Poland, Turkey, and Thailand). Designed to give a more in-depth analysis of reform policies for the students. Also offered for undergraduate-level credit as PS 455 and may be taken only once for credit. Expected preparation: PS 454/554.

PS 556 - Advanced Political Economy (3)
Readings seminar provides a review of the literature in theories and selected issues in international political economy. Core requirement for graduate students in the PAP doctoral program and for master’s students in political science who select international relations as their primary field of specialization.

PS 559 - Political and Economic Decision-making (3)
Examines the philosophical and conceptual assumptions embodied in alternative decisionmaking theories in the fields of economics and politics. Designed to show students the differences in individual and collective decision-making processes and the technical and social challenges faced in decision-making processes in the market place and the realm of politics. Examples cover local, national, and international policy topics. This course is the same as USP 636; can only be taken once for credit. Recommended prerequisite: USP 515/615. Crosslisted as: USP 636.

PS 560 - Political Development in Modern Turkey (4)
Designed to provide students with an in-depth study of political development literature with a focus on modern Turkey. Examines how modern Turkish republic emerged from the ashes of the Ottoman Empire and evaluate stages of political development during the first, second, and third republic. Finally, assesses the implications of Turkey’s new geopolitics (since the end of the Cold War) on Turkish political and economic development in a global perspective. Also offered for undergraduate-level credit as PS 460; this course is the same as Intl 560 and may only be taken once for credit.

PS 561 - Politics of Economic Reform in Modern Turkey (4)
This course is designed to provide students with an in depth study of political development literature with a focus on modern Turkey. We will examine how modern Turkish republic emerged from the ashes of the Ottoman Empire and evaluate stages of economic development during the first, second, and third republic. Finally, we will assess the implications of Turkey's new geopolitics (since the end of the Cold War) on Turkish economic development in a global perspective. Also offered for undergraduate-level credit as PS 461; this course is cross-listed as Intl 461/561; may only be taken once for credit.

PS 562 - International Relations of the Middle East (4)
Examination of the external dimension of Middle East politics; the role of the great powers; brief analysis of the British and French roles since 1945; extended analysis of American and Soviet/Russian policy in the Middle East. Special attention will be given to new patterns of international relations in the Middle East in the post-Cold War, post-Gulf War era. Also offered for undergraduate-level credit as PS 462 and may be taken only once for credit. Expected preparation: PS 361.

PS 563 - Politics and Policy of the Middle East (4)
Examines conceptual debates in comparative politics and international relations of the Middle East. Focuses on state formation; authoritarian politics, political regimes, and institutions; public opinion, Islamist movements; gender and politics; political economy; the Israeli-Palestinian conflict, and regional and international relations of the greater Middle East.

PS 566 - Politics of China (4)
A survey of the historical, institutional, and social roots of contemporary politics in China as well as a consideration of several public policy areas. Also offered for undergraduate-level credit as PS 466 and may be taken only once for credit.

PS 568 - International Politics of East Asia (4)
Examination of the foreign policy motives, objectives, and systems of the major East Asian states: China, Japan, and Korea. Attention is paid in particular to the political economy of regional and extra-regional relationships. Also offered for undergraduate-level credit as PS 468 and may be taken only once for credit.

PS 570 - Theories of Comparative Politics (4)
Examines the evolution of the theories and methods of comparative politics, addressing both the recent history of the discipline and the current state of its practices. Topics include: the behavioral revolution, political development, the role of state, the new institutionalism, and the state-in-society approaches. Also offered for undergraduate-level credit as PS 470 and may be taken only once for credit. Expected preparation: PS 204.

PS 571 - Gender & Politics: A Comparative Perspective (4)
Examination of the role, progress, behavior, and power of women in politics using a comparative lens. Topics include the representation of women in government, the problems confronting female candidates, the behavior of women officeholders, and the gender gap in politics. Examines women in western democracies, as well as in communist states and developing nations. Individual countries are used as case studies. Also offered for undergraduate-level credit as PS 471 and may be taken only once for credit.
credit. Expected preparation: PS 200 and junior standing.

PS 572 - Democratization and Authoritarianism in the Middle East and North Africa (4)
Introduction to theoretical, empirical, and methodological debates in the comparative and international relations of the Middle East. Examination of contemporary political, economic, and social topics, including institutions and regimes, political economy, women and politics, Israeli-Palestinian conflict, and regional and international affairs. Also offered for undergraduate-level credit as PS 472 and may be taken only once for credit.

Prerequisite: upper-division standing.

PS 573 - Government and Politics of Arab North Africa (4)
Examines the domestic and international politics of Arab North Africa, including Morocco, the Moroccan/Western Sahara, Mauritania, Algeria, Tunisia, Libya, and Egypt. Topics include the history of the region, political regimes and authoritarianism, the Arab spring, women’s rights, and U.S.-Maghrebi relations. Also offered for undergraduate-level credit as PS 473 and may be taken only once for credit.

Prerequisite: upper-division standing.

PS 574 - Democracy and Development in Latin America (4)
Examines issues of democracy and development in Latin America. It addresses such topics as the role of history, political culture, political leadership, political institutions, the state, the military, civil society, social classes, level of socioeconomic development, and their relationship to the possibilities of success or failure for democracy in Latin America. The course examines specific cases such as Argentina, Brazil, Mexico, Chile, Peru, Venezuela, and Uruguay. Also offered for undergraduate-level credit as PS 474 and may be taken only once for credit. Expected preparation: PS 353.

PS 575 - Comparative Democratic Institutions (4)
Examines differences in how democratic governments are structured across the globe and what these differences mean for governing. Explores differences both among and between presidential, parliamentary, and semi-presidential political systems.

Experiences federal and unitary political structures, and the role of supreme courts. Field trip to observe alternative democratic system. Also offered for undergraduate-level credit as PS 478 and may be taken only once for credit.

PS 579 - Transitions to Democracy (4)
Comparative analysis of political systems which have experienced a transition from an authoritarian to a democratic regime. Attention is given to the conditions supportive of democratic transition and to the problems of maintaining democratic stability. Also offered for undergraduate-level credit as PS 479 and may be taken only once for credit. Expected preparation: PS 204.

PS 581 - Democratic Theory (4)
Critical examination of the principles of democratic politics, including important statements in the history of political thought and contemporary political theory. Issues discussed include participation, deliberation, electoral competition, constitutionalism, and the challenges of democratic legitimacy in the context of US institutions and increasing globalization. Also offered for undergraduate-level credit as PS 481 and may be taken only once for credit.

Prerequisite: sophomore standing or higher.

PS 582 - Liberalism and Its Critics (4)
Critical examination of the theory and practice of liberalism as an ongoing tradition. The basic elements of liberalism are identified and discussed and criticisms of the liberal tradition, as offered by communitarians, classical republicans, feminists, and postmodernists, are examined. Liberal responses to these criticisms are also explored. Also offered for undergraduate-level credit as PS 482 and may be taken only once for credit. Expected preparation: PS 381.

PS 583 - Justice in the Modern World (4)
Critical analysis of the nature and meaning of social justice. Special attention is given to liberal theories of justice, questions of distributive justice, justice and the rule of law, inter-generational justice, and political alternatives to the liberal vision of social justice. Also offered for undergraduate-level credit as PS 483 and may be taken only once for credit. Expected preparation: PS 381.

PS 586 - American Political Thought: 1600 to 1820 (4)
The development from 1600 to 1820 of American political thought about government and its proper relation to the individual and society. Specific topics considered include the English background; the colonial mind; ideas informing the revolution; the creation of the Constitution; and the ratification debates; the Jeffersonian and Hamiltonian conflict; John Marshall and the expansion of national power. Attention given to bringing to the surface the fundamental, often inarticulate, patterns, and presuppositions of American thought about political things. Also offered for undergraduate-level credit as PS 486 and may be taken only once for credit.

PS 587 - American Political Culture: 1820 to the Present (4)
The development from 1820 to the present of American political thought about government and its proper relation to life, liberty, property and the pursuit of happiness. Topics considered include democratization and the Jacksonian period, slavery, and the nature of the Union, Social Darwinism and industrialization, the progressive period, the coming of the welfare state, and contemporary concerns. Attention given to bringing to the surface the fundamental, often inarticulate, patterns, and presuppositions of American thought about political things. Also offered for undergraduate-level credit as PS 487 and may be taken only once for credit.

PS 593 - Philosophy of the Social Sciences (4)
An analysis of the practical challenges and competing approaches to the practice of social science, especially political science. Subjects considered include the aims of social science, concepts and description, causality, rationality, macro and micro explanations, interpretation, and postmodernism. Also offered for undergraduate-level credit as PS 493 and may be taken only once for credit.

PS 595 - Research Methods for Political Science (4)
Introduction to an examination of methodological issues and statistical techniques for empirical political research. Major topics include but are not limited to issues in designing political research, survey
research, the role of hypothesis testing, and the major statistical tools commonly employed in empirical political analysis. Also offered for undergraduate-level credit as PS 495 and may be taken only once for credit. Expected preparation: Mth 243, Mth 244.

**PS 605 - Reading and Conference (1-6)**
(Credit to be arranged.)

**PS 663 - Politics and Policy of the Middle East (4)**
Examines conceptual debates in comparative politics and international relations of the Middle East. Focuses on state formation; authoritarian politics, political regimes, and institutions; public opinion, Islamist movements; gender and politics; political economy; the Israeli-Palestinian conflict, and regional and international relations of the greater Middle East.

**Psy - Psychology**

**Psy 200 - Psychology as a Natural Science (4)**
Covers the scientific foundations of human behavior in areas such as physiological and biological psychology, cognitive, moral, and emotional development, sensation and perception, consciousness, learning, thinking and memory. Also focuses on issues in experimental design and teaches students how to critically evaluate psychological research.

**Psy 204 - Psychology as a Social Science (4)**
Explores human individuality and the social context of behavior. Topics include intelligence, personality, motivation, social psychology, coping with stress, and psychological disorders. Describes theories and research findings in the context of social issues and introduces students to challenges of psychological measurement. Recommended as a first psychology course for both majors and nonmajors.

**Psy 207 - Introduction to Applied Psychology (4)**
A survey of selected applications of concepts and methodologies from the different areas of psychology such as experimental, industrial/organizational, social, and developmental. Recommended prerequisites: Psy 200, 204.

**Psy 299 - Special Studies (1-4)**
(Credit to be Arranged.)
Prerequisite: Psy 204.

**Psy 300 - Personal Decision Making (4)**
How to make wiser decisions. Ways to think more creatively and more logically in making both everyday choices and major life decisions. Instruction and hands-on experience.

**Psy 300U - Personal Decision Making (4)**
How to make wiser decisions. Ways to think more creatively and more logically in making both everyday choices and major life decisions. Instruction and hands-on experience.

**Psy 310 - Psychology of Women (4)**
Review and evaluate assumptions underlying psychological research on women. Survey the research in areas such as the development of sex differences, acquisition of gender roles and maintenance of gender stereotypes. Explore the pertinence of these findings to topical areas such as women's work roles, women and mental health, and the women's movement.

**Psy 310U - Psychology of Women (4)**
Review and evaluate assumptions underlying psychological research on women. Survey the research in areas such as the development of sex differences, acquisition of gender roles and maintenance of gender stereotypes. Explore the pertinence of these findings to topical areas such as women's work roles, women and mental health, and the women's movement. Recommended prerequisite: 4 credits in 200-level psychology.

**Psy 317 - Personal and Social Adjustment (4)**
Prerequisite: Psy 200 and 204. Credit will not be given for both Soc 342 and Psy 342.

**Psy 340 - Principles of Behavior Analysis (4)**
A course in the concepts of behavior analysis. Includes presentation of respondent and operant conditioning, extinction, response differentiation, schedules of reinforcement, shaping, escape and avoidance behavior, stimulus discrimination, punishment and similar concepts. The course is intended to provide the student with a thorough introduction to a developing technology of behavior.

**Psy 341 - Social Psychology: Social Relationships and Groups (4)**
Examination of sociological and psychological processes associated with people's thoughts about and interactions with one another. Particular emphasis on self, social identity, social cognition, attitudes, prejudice and persuasion. Expected preparation: Soc 200, or Psy 200 or 204. Credit will not be given for both Soc 342 and Psy 342.

**Psy 342 - Social Psychology: Self, Attitudes and Social Influence (4)**
Examination of psychological and sociological processes associated with people's thoughts about and interactions with one another. Particular emphasis on self, social identity, social cognition, attitudes, prejudice and persuasion. Expected preparation: Soc 200, or Psy 200 or 204. Credit will not be given for both Soc 342 and Psy 342.
interpersonal attraction, group influence, conflict and cooperation. Expected preparation: Soc 200, or Psy 200 or 204. Credit will not be given for both Soc 343 and Psy 343.

Psy 345 - Motivation (4)
A course on the causes for acquiring, choosing, or persisting in specific actions within specific circumstances. Students review the conditions, principles, and theories of motivation. Recommended prerequisite: Psy 200 or 204.

Psy 346 - Learning (4)
Conditions, principles, and theories of learning. Assessment of experimental methods and results in relation to current theory. Recommended prerequisite: 4 credits in 200-level psychology.

Psy 347 - Perception (4)
Introduction to the principles and theories of visual and auditory perception. Topics include sensory pathways, color perception, perceptual illusions, and the role of knowledge and cognitive factors in perception. Recommended prerequisite: Psy 200.

Psy 348 - Cognition (4)
Processes by which we form representations of reality, and strategies we use for manipulating those representations in order to explore possible actions and outcomes. Includes topics in perception, attention, memory, imagery, language, comprehension, problem solving, creative thinking, judgment, reasoning, and decision making. Recommended prerequisite: 4 credits in 200-level psychology.

Psy 350 - Counseling (4)
A survey of counseling and interviewing procedures, contributions of psychological theory to counseling techniques. Recommended prerequisite: 4 credits in 200-level psychology.

Psy 357 - Comparative Psychology (4)
A study of the behavioral differences and similarities within the phylogenetic scale. Emphasis on the examination of the evolution of the behavior of individuals and species, paying particular attention to the basic concepts of psychology, such as sensation, perception, learning, and social processes. The role of animals in theories and as models for human behavior. Recommended prerequisite: 4 credits in 200-level psychology.

Psy 360 - Industrial/Organizational Psychology (4)
The scientific study of human behavior in work settings, covering the adjustments people make to the places they go, the people they meet, and the things they do in their occupational activities of all types. Recommended prerequisite: Psy 200 or 204.

Psy 361 - Industrial Psychology (4)
Overview of the scientific study of people in work settings, including job analysis, the measurement of individual differences for hiring and promoting workers, the assessment of employee performance through performance appraisal systems, and employee training. Course contains a substantial component focused on application through a community-based learning or class project.

Psy 362 - Organizational Psychology (4)
Overview of the scientific study of people in work settings, including work motivation, leadership, organizational change and development, group processes, work and family issues, stress, job attitudes, and occupational health psychology. Course contains a substantial component focused on applications such as community based learning or class projects.

Psy 399 - Special Studies (1-6)
(Credit to be arranged.)

Psy 401 - Research (0-6)
(Credit to be arranged.) Consent of instructor.

Psy 402 - Independent Study (1-12)
(Credit to be arranged.)

Psy 403 - Cooperative Education/Internship (0-12)
(Credit to be arranged.)

Psy 405 - Reading and Conference (0-6)
(Credit to be arranged.) Consent of instructor.

Psy 407 - Seminar (1-6)
(Credit to be arranged.) Consent of instructor.

Psy 409 - Practicum (0-12)
(Credit to be arranged.) Supervised psychological practice including observing, studying, and participating in the activities of private settings or community service agencies such as: schools, mental health clinics, correctional agencies, and day care centers. Supervision may include guided reading, daily journals, and evaluative reports.

Psy 410 - Selected Topics (1-6)
(Credit to be arranged.)

Psy 427 - History and Systems of Psychology (4)
A survey of the history of psychology and of past and current theoretical approaches in psychology. Study of the historical roots of current theories in perception, learning, motivation, personality and other fields. Also offered for graduate-level credit as Psy 527 and may be taken only once for credit. Recommended prerequisites: Stat 243 and Stat 244, at least 18 credits in psychology, including Psy 321.

Psy 429 - The Psychology of Race & Gender in Sport (4)
Using a social psychological approach, this course will examine how issues of race and gender affect the sporting domain. Specifically, the course will emphasize how social psychological theories of intergroup relations, stereotyping, prejudice, and discrimination impact athletes, coaches, referees, and fans.

Prerequisite: upper-division standing.

Psy 430 - Applied Social Psychology (4)
Explores current and potential applications of social psychological theories and research methods, with a focus on work conducted in field settings. As a final project, each student examines an applied area of their own choosing (previous projects have focused on normative role transitions, responses to natural disasters, political attitudes, conflict resolution, and intergroup relations). Also offered for graduate-level credit as Psy 530 and may be taken only once for credit. Recommended prerequisites: Stat 243 and Stat 244, Psy 321, Psy 342, or Psy 343.
Psy 431 - Psychology of Men and Masculinities (4)

Reviews various social and personality theories that describe the psychology of men and the diverse forms and expressions of masculinity across cultures. Applies these theories to a wide range of issues in men’s lives, including emotions, health, work and family roles, sexuality, relationships, and violence.

Prerequisite: four credits in psychology.

Psy 431U - Psychology of Men and Masculinities (4)

Reviews various social and personality theories that describe the psychology of men and the diverse forms and expressions of masculinity across cultures. Applies these theories to a wide range of issues in men’s lives, including emotions, health, work and family roles, sexuality, relationships, and violence.

Prerequisite: four credits in psychology.

Psy 432 - Personality (4)

Personality structure and theory.

Recommended prerequisite: Stat 243 and 244, eight credits in psychology, including Psy 321.

Psy 433 - Introduction to Psychological Testing (4)

Covers theoretical and practical issues related to psychological tests used in educational, organizational, and clinical settings. Testing areas covered include intelligence, personality, values, interests, moral development, aptitudes and psychological disorders. Students will learn how to evaluate the quality of a psychological test and how to make informed choices about whether a test is appropriate for a particular setting.

Recommended prerequisites: Psy 321 and Stat 243 and 244.

Psy 434 - Introduction to Psychopathology (4)

Course content will survey the development of modern ideas of mental illness, the origins of mental illnesses, the diagnostic system and the clinical syndromes, and methods of treatment of neuropsychiatric disorder. This course does not produce diagnosticians of mental illness but is a preparation for the clinical study of diagnosis. Also offered for graduate-level credit as Psy 534 and may be taken only once for credit. Recommended prerequisites: Psy 200, Psy 204, Stat 243 and Stat 244, and at least 6 additional credits in psychology, including Psy 321.

Psy 436 - Performance Appraisal and Feedback (4)

Applications of psychological concepts to the development of performance appraisal systems in organizations. Topics include job analysis, cognitive processes in performance appraisal, types of rating scales, rater training methods, technical aspects of developing a performance appraisal system, performance feedback, individuals’ reactions to performance feedback factors related to the perceived accuracy of performance feedback. Recommended prerequisites: Stat 243 and 244, Psy 321 and 360 or 361.

Psy 440 - Group Process (4)

A course on the psychology of small groups. Topics will include but not be limited to: interpersonal attraction, stages of group development, group structure, coalition formation, personal power, leadership, group decision making and problem solving, intergroup relations and the principles of negotiation. Also offered for graduate-level credit as Psy 540 and may be taken only once for credit. Recommended prerequisite: Stat 243 and Stat 244, Psy 321, graduate standing or consent of instructor.

Psy 444 - Job Analysis (4)

Methods (e.g., interviews, surveys) used to collect information about jobs for use in human resource functions such as personnel recruitment and selection, training, performance appraisal, and compensation. Such information is also used to develop job descriptions and specifications. Course contains a community-based learning component. Students participate in a full job analysis including data collection, analysis, and interpretation. Also offered for graduate-level credit as Psy 544 and may be taken only once for credit. Recommended prerequisites: Stat 243 and Stat 244; Psy 321 and Psy 360 or Psy 361; or comparable Business Administration courses.

Psy 445 - Employee Development (4)

Covers the application of psychological principles to employee training and development. Topics include organization, job, and person analysis; program design; the application of learning principles to enhance training effectiveness; evaluation of training programs; and employee training and development methodology. A heavy emphasis is placed on current psychological research. This course may include a community-based learning component. Also offered for graduate-level credit as Psy 545 and may be taken only once for credit. Recommended prerequisites: Stat 243 and Stat 244; Psy 321 and Psy 360 or Psy 361.

Psy 447 - Personnel Psychology (4)

How individual differences affect work behavior and task performance and how psychologists measure and predict such differences. Covers the development, administration, and utility of modern instruments for selection and appraisal. Data combination strategies and decision making in personnel systems are discussed. Also offered for graduate-level credit as Psy 547 and may be taken only once for credit. Recommended prerequisites: Stat 243 and Stat 244, Psy 321 and Psy 360 or Psy 361.

Psy 448 - Psychology of Work Motivation (4)

Examination of the role that motivation plays in initiating, guiding, and maintaining work behaviors. Discussion of job attitudes, emotional intelligence, personality factors, socialization and culture, effects of participation, careers, job enrichment, re-engineering, and power and politics. Also offered for graduate-level credit as Psy 548 and may be taken only once for credit. Recommended prerequisite: Psy 321.

Psy 449 - Survey of Human Factors (4)

An introduction to systems analysis concepts. An examination of the role of man and his interrelationships with complex man-machine systems. Topics include: man-machine systems, visual and auditory presentation of information, design of controls, layout of work places, effects of environment on human performance, and the physical limits of human performance. Recommended prerequisites: eight credits in psychology; Stat 243, 244, and Psy 321.

Psy 451 - Introduction to Neurophysiological Psychology (4)

The study of the nervous system, various anatomical, neurophysiological, and imaging techniques for studying the brain and behavior, including specific cognitive abilities such as sensation, perception, attention, language, and emotion. Also offered for
graduate-level credit as Psy 551 and may be taken only once for credit.

Prerequisite: Junior standing.

Psy 454 - Experimental Psychology (5)

Principles of experimental design, evaluation of research methods, formulation and testing of hypotheses using research procedures, use of statistical software for analyzing the research data, writing a research manuscript using APA form. Recommended prerequisites: at least 12 credits in psychology including Psy 321 and at least one of the following: Stat 243 and 244.

Psy 455 - Experimental Psychology (4)

Principles of experimental design, evaluation of research methods, formulation and testing of hypotheses using research procedures, use of statistical software for analyzing the research data, writing a research manuscript using APA form. Recommended prerequisites: at least 12 credits in psychology including Psy 321 and at least one of the following: Stat 243 and 244.

Psy 459U - Infant Development (4)

Development of the individual from conception to age two. Theory and research pertaining to infant development.

Prerequisite: Upper-division standing.

Psy 460 - Child Psychology (4)

Development of the individual from conception through childhood. Theory and research pertaining to child development. Also offered for graduate-level credit as Psy 560 and may be taken only once for credit. Recommended prerequisite: Stat 243 and Stat 244, Psy 311 and Psy 321.

Psy 461 - Psychology of Adolescence and Early Maturity (4)

Development of the individual from puberty to early adulthood. Theory and research pertaining to adolescent development.

Prerequisite: Upper-division standing.

Psy 461U - Psychology of Adolescence and Early Maturity (4)

Development of the individual from puberty to early adulthood. Theory and research pertaining to adolescent development.

Prerequisite: Upper-division standing.

Psy 462 - Psychology of Adult Development and Aging (4)

Development of the individual from early adulthood through old age. Theory and research focusing on adult development from a life-span perspective. Also offered for graduate-level credit as Psy 562 and may be taken only once for credit. Recommended prerequisites: Stat 243 and Stat 244, Psy 311 and Psy 321 plus one of the following: Psy 459, Psy 460, or Psy 461.

Psy 464 - Developmental Psychopathology (4)

Study of the origins and course of individual patterns of behavioral adaptation and maladaptation. Application of developmental principles to an understanding of social, emotional, and conduct disorders of children and their outcome in adult life. Also offered for graduate-level credit as Psy 564 and may be taken only once for credit. Recommended prerequisites: Stat 243 and Stat 244, Psy 311 and Psy 434 plus 8 credits in courses numbered Psy 459-461.

Psy 465 - Applied Developmental Psychology (4)

Theory, methods, and research in selected areas of applied developmental psychology. Also offered for graduate-level credit as Psy 565 and may be taken only once for credit. Recommended prerequisites: Stat 243 and Stat 244, Psy 311 and Psy 434 plus 8 credits in courses numbered Psy 459-461.

Psy 466 - Social Development (4)

Development of individual's social relationships from infancy to adolescence. Theory and research pertaining to social development from an interactional perspective. Also offered for graduate-level credit as Psy 568 and may be taken only once for credit. Recommended prerequisites: Stat 243 and Stat 244, Psy 311 and one of the following: Psy 459, Psy 460, Psy 461, or Psy 462.

Psy 471 - Health Psychology (4)

Study of the social and psychological influences on how people stay well, why some people become ill, and how persons respond to illness. Particular attention to the stress process. Also offered for graduate-level credit as Psy 571 and may be taken only once for credit. Recommended prerequisites: Stat 243 and Stat 244, plus 12 credits in psychology, including Psy 321; Soc 200 may be substituted for 4 of these credits and PHE 223 may be substituted for 4 of these credits.

Psy 478 - Leadership and Group Effectiveness (4)

Study of leadership in small groups with an emphasis on interpersonal influence processes. Leadership is viewed as statements or actions intended to influence a group's efforts toward goal setting and achievement. Includes discussion of leadership training/development, and self-awareness of style. Also offered for graduate-level credit as Psy 578 and may be taken only once for credit. Recommended prerequisite: Psy 321.

Psy 479 - Women and Organizational Psychology (4)

Examines the relationship between gender and work in different kinds of organizations across the economy. Focus is on the ways that gender influences such experiences as stress, hiring and career development, leadership opportunity, group interactions and organizational relationships, and the ways the greater understanding of gender/work interactions can influence individual experience and result in strategies for change. Recommended prerequisites: Stat 243 and Stat 244, Psy 310 and Psy 321.
Psy 480 - Community Psychology (4)

Community Psychology seeks to understand the relationship between individual well-being and diverse environmental influences, from families and neighborhoods to culture and mass media. In this course, students will learn major theories and concepts in the field, apply them to pressing social issues, evaluate their implications for research, practice, and policy. Also offered for graduate-level credit as Psy 580 and may be taken only once for credit.

Prerequisite: upper-division standing.

Psy 484 - Principles of Behavior Modification (4)

A survey of recent developments in the application of behavior theory to problems of psychological adjustment. The course includes treatment of the behavioral concept of "abnormal", and the development of a technology of behavior therapy. The course is intended for advanced students in psychology, social work, special education, speech pathology, and nursing. Also offered for graduate-level credit as Psy 584 and may be taken only once for credit.


Psy 485 - Self-modification of Behavior (4)

The technology of self-change developed within the framework of behavior modification theory, including relevant ethical and theoretical issues, specific techniques of change and the application of these techniques within a systematic program development model. Also offered for graduate-level credit as Psy 585 and may be taken only once for credit.

Prerequisite: Psy 484. Expected preparation: Psy 346.

Psy 486 - Human Performance and Mental Workload (4)

Introduction to mathematical and conceptual theories of how the human performs simple and complicated tasks. Topics include signal detection theory, information theory, reaction time, attention, effort. Measures and theories of mental workload will be discussed as well as what leads to cognitive overload and how it can be altered. Recommended prerequisites: Psy 321, Stat 243 and 244, and 12 credits of psychology.

Psy 487 - Life-span Development (4)

Theories and methodology for the study of processes and change in life-span developmental perspective. Practical implications of different perspectives for theories and research regarding human development. Also offered for graduate-level credit as Psy 587 and may be taken only once for credit. Recommended prerequisites: Stat 243 and Stat 244, Psy 311 and Psy 321 plus 8 credits in courses numbered Psy 459, Psy 460, Psy 461, or Psy 462.

Psy 491 - Decision Making I: Values & Choice (4)

Normative models, descriptive models, and cognitive aids for structuring decision problems, evaluating consequences of alternative courses of action, and choosing among alternatives.

Prerequisite: Stat 243 and 244, Psy 321 and 348; or permission of instructor.

Psy 492 - Decision Making II: Judgement and Reason (4)

Contact the department for a description of this course.

Psy 493 - Decision Making Laboratory (4)

Practice in the use of judgment techniques and decision software to structure decision problems, evaluate alternative courses of action, perform sensitivity analyses, and prepare presentations. Wherever possible, practice will be on current decision problems in field settings. Also offered for graduate-level credit as Psy 593 and may be taken only once for credit. Recommended prerequisites: Psy 491/591, Psy 492/592.

Psy 495 - Psychological Measurement (4)

Development, validation, and applications of psychological tests. Students will learn about various types of psychological tests, the issues of reliability, validity, item analysis, and standardization of tests, and ethics in choosing and applying tests. There will be both lecture and lab portions required.

Prerequisite: Stat 243 and 244, and Psy 321.

Psy 497 - Applied Survey Research (4)

Provides theoretical framework for and experience in design, execution, and interpretation of social surveys including sampling procedures, questionnaire design, interviewing techniques, coding and computer analysis, and report writing. Also offered for graduate-level credit as Psy 597 and may be taken only once for credit. Recommended prerequisites: Stat 243 and Stat 244, Psy 321.

Psy 498 - Field Observation Methods (4)

Applied experience in the major methodological techniques of field observation, as well as the key problems of validity and reliability as they arise while developing a behavioral observation system. Also offered for graduate-level credit as Psy 598 and may be taken only once for credit. Recommended prerequisites: Stat 243 and Stat 244, Psy 321, plus 12 upper-division credits in psychology.

Psy 501 - Research (0-9)

(Credit to be arranged.) Consent of instructor.

Psy 503 - Thesis (0-9)

(Credit to be arranged.)

Psy 504 - Cooperative Education/Internship (0-9)

(Credit to be arranged.)

Psy 505 - Reading and Conference (0-9)

(Credit to be arranged.) Consent of instructor.

Psy 506 - Projects (1-9)

(Credit to be arranged.)

Psy 507 - Seminar (1-6)

(Credit to be arranged.) Consent of instructor.

Psy 509 - Practicum (0-9)

(Credit to be arranged.) Supervised psychological practice including observing, studying, and participating in the activities of private settings or community service agencies such as: schools, mental health clinics, correctional agencies, and day care centers. Supervision may include guided reading, daily journals, and evaluative reports.

Psy 510 - Selected Topics (1-6)

(Credit to be arranged.)
Psy 514 - Advanced Applied Social Psychology (4)
Theory, methods, and selected topics in advanced applied social psychology. Also offered as Psy 614 and may be taken only once for credit.

Psy 515 - Advanced Applied Developmental Psychology (4)
Theory, methods, and selected topics in advanced applied developmental psychology. Also offered as Psy 615 and may be taken only once for credit.

Psy 516 - Advanced Organizational Psychology (4)
Theory, methods, and selected topics in organizational psychology including leadership, motivation, job attitudes, job stress, organizational climate, and employee retention. Also offered as Psy 616 and may be taken only once for credit.

Psy 517 - Advanced Industrial Psychology (4)
Theory, methods, and selected topics in industrial psychology including job analysis, performance appraisal, personnel selection, legal issues, and training. Also offered as Psy 617 and may be taken only once for credit. Expected preparation: admission to Psychology graduate program.

Psy 518 - Ethics and Professional Issues in Applied Research and Practice (4)
Examines ethical issues of importance to applied psychologists with special attention to the use of human subjects in psychological research. Addresses ethical issues in professional relationships and in the teaching of psychology. Also offered as Psy 618 and may be taken only once for credit.

Psy 519 - Field Experimental Methods (4)
Problems of designing an experimental investigation of psychological phenomena in a naturalistic field setting. Course requirements include the design of a realistic research proposal. Extensive use is made of instructor experience with field experimental studies in the field of mental health. Prerequisite: graduate status in psychology or urban studies.

Psy 520 - Methods of Psychological Assessment (4)
Formulation of problems that can be answered by tests. Reliability, validity, and standardization of measurement, test fairness; methods of identifying assessment tools (tests, etc.) appropriate to specific testing or assessment problems are also considered. Prerequisite: Stat 243.

Psy 521 - Univariate Quantitative Methods (5)
Survey of topics in univariate quantitative methods, including: graphical displays, descriptive statistics, statistical inference, group comparisons, analysis of variance for between group and factorial designs, correlation, regression, and analysis of association for categorical variables. Also offered as Psy 621 and may be taken only once for credit.

Psy 522 - Multiple Regression and Multivariate Quantitative Methods (5)
Exploration of statistical methods with several variables, including: simultaneous and hierarchical regression, discriminant analysis, multivariate analysis of variance, analysis of covariance, and logistic regression. SPSS will be used for conducting analyses and students will gain experience in writing journal quality results and discussion sections. Also offered as Psy 622 and may be taken only once for credit.

Psy 523 - Factor Analysis and Covariance Structure Modeling (5)
Introduction to factor analysis and covariance structure modeling, topics include common factor analysis, principal components analysis, confirmatory factor analysis, mediator models, moderator models, model modification, research issues in building and confirming models. Also offered as Psy 623 and may be taken only once for credit.

Psy 524 - Research Design in Applied Psychology (4)
Process of exploring how key social/community, organizational, and developmental concepts shape the conceptualization and design of research in applied psychology. Students conceptualize and construct three alternative study designs employing the relevant concepts.

Psy 525 - Applied Research and Practice (4)
Theory, methods, and selected topics in advanced applied psychology. Also offered as Psy 614 and may be taken only once for credit.

Psy 526 - History and Systems of Psychology (4)
A survey of the history of psychology and of past and current theoretical approaches in psychology. Study of the historical roots of current theories in perception, learning, motivation, personality and other fields. Also offered for undergraduate-level credit as Psy 427 and may be taken only once for credit. Recommended prerequisites: Stat 243 and Stat 244, at least 18 credits in psychology, including Psy 321.

Psy 527 - Seminar in Applied Developmental Psychology (4)
Theory and research in selected topics in applied developmental psychology. Also offered as Psy 628 and may be taken only once for credit.

Psy 528 - Seminar in Applied Social Psychology (4)
Explores current and potential applications of social psychological theories and research methods, with a focus on work conducted in field settings. As a final project, each student examines an applied area of their own choosing (previous projects have focused on normative role transitions, responses to natural disasters, political attitudes, conflict resolution, and intergroup relations). Also offered for undergraduate-level credit as Psy 430 and may be taken only once for credit. Recommended prerequisites: Stat 243 and Stat 244, Psy 321, Psy 342, or Psy 343.
Psy 532 - Clinical Interviewing (4)

Introduction to principles and techniques of interviewing. Focus on clinical applications in organizational settings.

Psy 533 - Contemporary Social Psychology (4)

Current knowledge of social psychology presented with an emphasis on what the field can contribute to understanding contemporary social problems and issues. Major topics will include the nature of social interaction, the relationship of attitude and behavior, and group processes. Areas of application will include social helping networks and the relationships of social psychology to law, health, and the environment.

Prerequisite: admission to a graduate program in psychology, systems science, or urban affairs.

Psy 534 - Introduction to Psychopathology (4)

Course content will survey the development of modern ideas of mental illness, the origins of mental illnesses, the diagnostic system and the clinical syndromes, and methods of treatment of neuropsychiatric disorder. This course does not produce diagnosticians of mental illness but is a preparation for the clinical study of diagnosis. Also offered for undergraduate-level credit as Psy 434 and may be taken only once for credit. Recommended prerequisites: Psy 200, Psy 204, Stat 243 and Stat 244; and at least 6 additional credits in psychology, including Psy 321.

Psy 535 - Psychological Consulting in Organizations (4)

Psychologically-based theories and techniques aimed at the planned change of organizational work setting for the purpose of enhancing individual development and improving organizational performance. Issues in consultant-client relationships, specific change methods, and system ramifications of guided change using the action research model are integrated throughout the course.

Psy 536 - Performance Appraisal and Feedback (4)

Applications of psychological concepts to the development of performance appraisal systems in organizations. Topics include job analysis, cognitive processes in performance appraisal, types of rating scales, rater training methods, technical aspects of developing a performance appraisal system, performance feedback, individuals' reactions to performance feedback factors related to the perceived accuracy of performance feedback. Recommended prerequisites: Stat 243 and 244, Psy 321 and 360 or 361.

Psy 537 - Qualitative Research Methods in Psychology (4)

Introduction to qualitative research methods in psychology. Covers epistemology, research design, data collection techniques, narrative analysis, computer-aided analysis of text, qualitative research ethics, and writing/reporting of research. Includes field research project in the community. Also offered as Psy 637 and may be taken only once for credit.

Psy 540 - Group Process (4)

A course on the psychology of small groups. Topics will include but not be limited to: interpersonal attraction, stages of group development, group structure, coalition formation, personal power, leadership, group decision making and problem solving, intergroup relations and the principles of negotiation. Also offered for undergraduate-level credit as Psy 440 and may be taken only once for credit. Recommended prerequisite: Stat 243 and Stat 244, Psy 321, graduate standing or consent of instructor.

Psy 544 - Job Analysis (4)

Methods (e.g., interviews, surveys) used to collect information about jobs for use in human resource functions such as personnel recruitment and selection, training, performance appraisal, and compensation. Such information is also used to develop job descriptions and specifications. Course contains a community-based learning component. Students participate in a full job analysis including data collection, analysis, and interpretation. Also offered for undergraduate-level credit as Psy 444 and may be taken only once for credit. Recommended prerequisites: Stat 243 and Stat 244; Psy 321 and Psy 360 or Psy 361; or comparable Business Administration courses.

Psy 545 - Employee Development (4)

Covers the application of psychological principles to employee training and development. Topics include organization, job, and person analysis; program design; the application of learning principles to enhance training effectiveness; evaluation of training programs; and employee training and development methodology. A heavy emphasis is placed on current psychological research. This course may include a community-based learning component. Also offered for undergraduate-level credit as Psy 445 and may be taken only once for credit. Recommended prerequisites: Stat 243 and Stat 244; Psy 321 and Psy 360 or Psy 361.

Psy 546 - Personnel Selection (4)

Technical and theoretical issues involved in selecting the appropriate worker to fit a job. Includes current research and theory in test development, test validation, selection methods, and criterion development. Heavy emphasis on psychological measurement (e.g., reliability and validity) and the legal issues involved in hiring and promoting employees. Also offered as Psy 646 and may be taken only once for credit.

Prerequisite: admission to the psychology graduate program.

Psy 547 - Personnel Psychology (4)

How individual differences affect work behavior and task performance and how psychologists measure and predict such differences. Covers the development, administration, and utility of modern instruments for selection and appraisal. Data combination strategies and decision making in personnel systems are discussed. Also offered for undergraduate-level credit as Psy 447 and may be taken only once for credit. Recommended prerequisites: Stat 243 and Stat 244, Psy 321 and Psy 360 or Psy 361.

Psy 548 - Psychology of Work Motivation (4)

Examination of the role that motivation plays in initiating, guiding, and maintaining work behaviors. Discussion of job attitudes, emotional intelligence, personality factors, socialization and culture, effects of participation, careers, job enrichment, re-engineering, and power and politics. Also offered for undergraduate-level credit as Psy 448 and may be taken only once for credit. Recommended prerequisite: Psy 321.
Psy 550 - Occupational Health Psychology (4)

Application of professional psychological principles of practice, theory, and research to work settings. Focus on science and practice drawn from psychology and other disciplines in the promotion and development of workplace health- and safety-related initiatives. Occupational Health Psychology researchers and practitioners draw from the domains of public health, preventive medicine, nursing, industrial engineering, law, epidemiology, and psychology to develop sound theory and practice for protecting and promoting the safety, health, and well being of individuals in occupational settings. Also offered as Psy 650 and may be taken only once for credit.

Psy 551 - Introduction to Neurophysiological Psychology (4)

The study of the nervous system, various anatomical, neurophysiological, and imaging techniques for studying the brain and behavior, including specific cognitive abilities such as sensation, perception, attention, language, and emotion. Also offered for undergraduate-level credit as Psy 451 and may be taken only once for credit.

Prerequisite: Junior standing.

Psy 554 - Social Psychology of Mental Health (4)

Principles of experimental design, evaluation of research methods, formulation and testing of hypotheses using research procedures, use of statistical software for analyzing the research data, writing a research manuscript using APA form. Also offered as Psy 654 and may be taken only once for credit. Recommended prerequisites: at least 12 credits in psychology including Psy 321 and at least one of the following: Stat 243 and 244.

Psy 555 - Infant Development (4)

Development of the individual from conception to age two. Theory and research pertaining to infant development.

Psy 560 - Child Psychology (4)

Development of the individual from conception through childhood. Theory and research pertaining to child development. Also offered for undergraduate-level credit as Psy 460 and may be taken only once for credit. Recommended prerequisite: Stat 243 and Stat 244, Psy 311 and Psy 321.

Psy 561 - Psychology of Adolescence and Early Maturity (4)

Development of the individual from puberty to early adulthood. Theory and research pertaining to adolescent development.

Psy 562 - Psychology of Adult Development and Aging (4)

Development of the individual from early adulthood through old age. Theory and research focusing on adult development from a life-span perspective. Also offered for undergraduate-level credit as Psy 462 and may be taken only once for credit. Recommended prerequisites: Stat 243 and Stat 244, Psy 311 and Psy 321 plus one of the following: Psy 459, Psy 460, or Psy 461.

Psy 564 - Developmental Psychopathology (4)

Study of the origins and course of individual patterns of behavioral adaptation and maladaptation. Application of developmental principles to an understanding of social, emotional, and conduct disorders of children and their outcome in adult life. Also offered for undergraduate-level credit as Psy 464 and may be taken only once for credit.

Recommended prerequisites: Stat 243 and Stat 244, Psy 321 and Psy 434 plus 8 credits in courses numbered Psy 459-461.

Psy 565 - Applied Developmental Psychology (4)

Theory, methods, and research in selected areas of applied developmental psychology. Also offered for undergraduate-level credit as Psy 465 and may be taken only once for credit. Recommended prerequisites: Stat 243 and Stat 244, Psy 311 and Psy 321 and consent of instructor.

Psy 566 - Research in Applied Developmental Psychology (4)

Conducted in collaboration with an approved faculty research mentor. Research areas may include prosocial, social, cognitive, and motivational development, attachment, peer groups, parenting, teaching, early literacy, identity, aging, coping, self-system processes, and the social and cross-cultural contexts of development, including the family, schools, and day care. Involves data gathering, analysis, and/or reporting results of research conducted in a field setting. Emphasis on applied issues related to research design, data collection, data analysis, and scientific writing. Also offered as Psy 669 and may be taken only once for credit.

Psy 567 - Work and Family (4)

An examination of the effects of work on family, and family on work, in contemporary society. Includes study of dual-career and dual-work families, effects of maternal employment on children, impact of child care and elder care on the workplace, and parental leave and other workplace supports for families. Implications of research for social policy. Also offered for undergraduate-level credit as Psy 467 and may be taken only once for credit.

Recommended prerequisites: Stat 243 and Stat 244, Psy 311 and Psy 321.

Psy 568 - Social Development (4)

Development of individual's social relationships from infancy to adolescence. Theory and research pertaining to social development from an interactional perspective. Also offered for undergraduate-level credit as Psy 468 and may be taken only once for credit. Recommended prerequisites: Stat 243 and Stat 244, Psy 311 and Psy 321 and one of the following: Psy 459, Psy 460, Psy 461, or Psy 462.

Psy 569 - Research in Applied Social/Community Psychology (4)

Conducted in collaboration with an approved faculty research mentor. Research areas may include social relationships and health behaviors; social relationships and subjective well-being; community-based interventions; self-help groups; social psychological perspectives on social movements; gender issues; family violence; and prevention. Involves data gathering, analysis, and/or reporting results of research conducted in a field setting. Emphasis on applied issues related to research design, data collection, data analysis, and scientific writing. Also offered as Psy 669 and may be taken only once for credit.

Psy 571 - Health Psychology (4)

Study of the social and psychological influences on how people stay well, why some people become ill, and how persons respond to illness. Particular attention to the stress process. Also offered for undergraduate-level credit as Psy 471 and...
may be taken only once for credit. Recommended prerequisites: Stat 243 and Stat 244, plus 12 credits in psychology, including Psy 321; Soc 200 may be substituted for 4 of these credits and PHE 223 may be substituted for 4 of these credits.

Psy 578 - Leadership and Group Effectiveness (4)

Study of leadership in small groups with an emphasis on interpersonal influence processes. Leadership is viewed as statements or actions intended to influence a group's efforts toward goal setting and achievement. Includes discussion of leadership training/development, and self-awareness of style. Also offered for undergraduate-level credit as Psy 478 and may be taken only once for credit. Recommended prerequisite: Psy 321.

Psy 580 - Community Psychology (4)

Community Psychology seeks to understand the relationship between individual well-being and diverse environmental influences, from families and neighborhoods to culture and mass media. In this course, students will learn major theories and concepts in the field, apply them to pressing social issues, evaluate their implications for research, practice, and policy. This course also offered for undergraduate credit as Psy 480 and may be taken only once for credit.

Psy 584 - Principles of Behavior Modification (4)

A survey of recent developments in the application of behavior theory to problems of psychological adjustment. The course includes treatment of the behavioral concept of "abnormal", and the development of a technology of behavior therapy. The course is intended for advanced students in psychology, social work, special education, speech pathology, and nursing. Also offered for undergraduate-level credit as Psy 484 and may be taken only once for credit.


Psy 585 - Self-modification of Behavior (4)

The technology of self-change developed within the framework of behavior modification theory, including relevant ethical and theoretical issues, specific techniques of change and the application of these techniques within a systematic program development model. Also offered for undergraduate-level credit as Psy 485 and may be taken only once for credit.

Prerequisite: Psy 484. Expected preparation: Psy 346.

Psy 586 - Social Program Evaluation (4)

Foundational concepts in social program evaluation theory and practice including theoretical perspectives on the nature and purpose of program evaluation, phases of program evaluation, ethics and standards of practice, sociopolitical considerations, and proposal and report writing. Also offered as Psy 686 and may be taken only once for credit. Recommended prerequisites: Psy 521/621, Psy 522/622, Psy 524/624.

Psy 587 - Life-span Development (4)

Theories and methodology for the study of processes and change in life-span developmental perspective. Practical implications of different perspectives for theories and research regarding human development. Also offered for undergraduate-level credit as Psy 487 and may be taken only once for credit. Recommended prerequisites: Stat 243 and Stat 244, Psy 311 and Psy 321 plus 8 credits in courses numbered Psy 459, Psy 460, Psy 461, or Psy 462.

Psy 589 - Adult Socialization (4)

This course examines the acquisition of social roles in adulthood. Two themes prevail: stages of socialization; and levels of transmission of social norms (cultural, organizational, and interpersonal).

Prerequisite: graduate status. Also offered as Psy 689 and may be taken only once for credit.

Psy 591 - Decision Making I: Values and Choice (4)

Normative models, descriptive models, and cognitive aids for structuring decision problems, evaluating consequences of alternative courses of action, and choosing among alternatives.

Prerequisite: Stat 243 and Stat 244, Psy 321 and 348; or permission of instructor.

Psy 592 - Decision Making II: Judgement and Reason (4)

Normative and descriptive models for structuring decision problems, evaluating consequences of alternative courses of action, thinking about probability and causation, and choosing among alternatives. Recommended prerequisites: Stat 243 and 244, Psy 321 and 348.

Psy 593 - Decision Making Laboratory (4)

Practice in the use of judgment techniques and decision software to structure decision problems, evaluate alternative courses of action, perform sensitivity analyses, and prepare presentations. Wherever possible, practice will be on current decision problems in field settings. Also offered for undergraduate-level credit as Psy 493 and may be taken only once for credit. Recommended prerequisites: Psy 491/591, Psy 492/592.

Psy 594 - Mathematical Models in Psychology (4)

Introduction to the use of probability theory and elementary functions in models for psychological processes: applications include decision analysis, psychophysics, and descriptive and theoretical applications of Markov chains in the study of learning and interpersonal interactions.

Psy 595 - Psychological Measurement (4)

Theories, methods, and implications in the development and validation of measures of psychological constructs. Students will learn about the issues of reliability, validity, item analysis, standardization, and applications of measures via both lectures and hands-on experiences in the lab. Also offered as Psy 695 and may be taken only once for credit. Expected preparation: PSYS21/621 or equivalent statistics/method courses.

Psy 597 - Applied Survey Research (4)

Provides theoretical framework for and experience in design, execution, and interpretation of social surveys including sampling procedures, questionnaire design, interviewing techniques, coding and computer analysis, and report writing. Also offered for undergraduate-level credit as Psy 497 and may be taken only once for credit. Recommended prerequisites: Stat 243 and Stat 244, Psy 321.
Psy 598 - Field Observation Methods (4)
Applied experience in the major methodological techniques of field observation, as well as the key problems of validity and reliability as they arise while developing a behavioral observation system. Also offered for undergraduate-level credit as Psy 498 and may be taken only once for credit. Recommended prerequisites: Stat 243 and Stat 244, Psy 321, plus 12 upper-division credits in psychology.

Psy 601 - Research (1-12)
(Credit to be arranged.) Consent of instructor.

Psy 602 - Independent Study (1-9)
(Credit to be arranged.)

Psy 603 - Dissertation (1-12)
(Credit to be arranged.)

Psy 604 - Internship (1-9)
(Credit to be arranged.)

Psy 605 - Reading and Conference (1-6)
(Credit to be arranged.) Consent of instructor.

Psy 606 - Projects (1-9)
(Credit to be arranged.)

Psy 607 - Seminar (1-6)
(Credit to be arranged.) Consent of instructor.

Psy 608 - Workshop (1-9)
(Credit to be arranged.)

Psy 609 - Practicum (1-9)
(Credit to be arranged.)

Psy 610 - Selected Topics (1-6)
(Credit to be arranged.)

Psy 614 - Advanced Applied Social Psychology (4)
Theory, methods, and selected topics in advanced applied social psychology. Also offered as Psy 514 and may be taken only once for credit.

Psy 615 - Advanced Applied Developmental Psychology (4)
Theory, methods, and selected topics in advanced applied developmental psychology. Also offered as Psy 515 and may be taken only once for credit.

Psy 616 - Advanced Organizational Psychology (4)
Theory, methods, and selected topics in organizational psychology including leadership, motivation, job attitudes, job stress, organizational climate, and employee retention. Also offered as Psy 516 and may be taken only once for credit.

Psy 617 - Advanced Industrial Psychology (4)
Theory, methods, and selected topics in industrial psychology including job analysis, performance appraisal, personnel selection, legal issues, and training. Also offered as Psy 517 and may be taken only once for credit. Expected preparation: admission to Psychology graduate program.

Psy 618 - Ethics and Professional Issues in Applied Research and Practice (4)
Examines ethical issues of importance to applied psychologists with special attention to the use of human subjects in psychological research. Addresses ethical issues in professional relationships and in the teaching of psychology. Also offered as Psy 518 and may be taken only once for credit.

Psy 621 - Univariate Quantitative Methods (5)
Survey of topics in univariate quantitative methods, including: graphical displays, descriptive statistics, statistical inference, group comparisons, analysis of variance for between group and factorial designs, correlation, regression, and analysis of association for categorical variables. Also offered as Psy 521 and may be taken only once for credit.

Psy 622 - Multiple Regression and Multivariate Quantitative Methods (5)
Exploration of statistical methods with several variables, including: simultaneous and hierarchical regression, discriminant analysis, multivariate analysis of variance, analysis of covariance, and logistic regression. SPSS will be used for conducting analyses and students will gain experience in writing journal quality results and discussion sections. Also offered as Psy 522 and may be taken only once for credit.

Psy 623 - Factor Analysis and Covariance Structure Modeling (5)
Introduction to factor analysis and covariance structure modeling, topics include common factor analysis, principal components analysis, confirmatory factor analysis, mediator models, moderator models, model modification, research issues in building and confirming models. Also offered as Psy 523 and may be taken only once for credit.

Psy 624 - Research Design in Applied Psychology (4)
Process of exploring how key social/community, organizational, and developmental concepts shape the conceptualization and design of research in applied psychology. Students conceptualize and conduct three alternative study designs employing the relevant concepts. Explore basic design issues such as control, causation, confounding, contrasts, and threats to validity; measurement; and the use of key concepts such as organizational context, social interactions, dynamics, levels of analysis, and systems in psychological theory and research. Also offered as Psy 524 and may be taken only once for credit.

Psy 628 - Seminar in Applied Developmental Psychology (4)
Theory and research in selected topics in applied developmental psychology. Also offered as Psy 528 and may be taken only once for credit.

Psy 629 - Psychological Issues in Later Life (4)
Methodological, theoretical and empirical issues in research on psychology and aging. Topics include cognitive processes, family and caregiving relationships, environmental issues and psychological predictors of successful aging. Emphasis is on encouraging students to develop their own research project in the field of psychology of aging. Prerequisite: admission to a graduate program or Graduate Certificate in Gerontology program.

Psy 632 - Clinical Interviewing (4)
Introduction to principles and techniques of interviewing. Focus on clinical applications in organizational settings.
Psy 633 - Contemporary Social Psychology (4)
Current knowledge of social psychology presented with an emphasis on what the field can contribute to understanding contemporary social problems and issues. Major topics will include the nature of social interaction, the relationship of attitude and behavior, and group processes. Areas of application will include social helping networks and the relationships of social psychology to law, health, and the environment.
Prerequisite: admission to a graduate program in psychology, systems science, or urban affairs.

Psy 635 - Psychological Consulting in Organizations (4)
Psychologically-based theories and techniques aimed at the planned change of organizational work setting for the purpose of enhancing individual development and improving organizational performance. Issues in consultant-client relationships, specific change methods, and system ramifications of guided change using the action research model are integrated throughout the course.

Psy 637 - Qualitative Research Methods in Psychology (4)
Introduction to qualitative research methods in psychology. Covers epistemology, research design, data collection techniques, narrative analysis, computer-aided analysis of text, qualitative research ethics, and writing/reporting of research. Includes field research project in the community. Also offered as Psy 537 and may be taken only once for credit.

Psy 646 - Personnel Selection (4)
Technical and theoretical issues involved in selecting the appropriate worker to fit a job. Includes current research and theory in test development, test validation, selection methods, and criterion development. Heavy emphasis on psychological measurement (e.g., reliability and validity) and the legal issues involved in hiring and promoting employees. Also offered as Psy 546 and may be taken only once for credit.

Psy 650 - Occupational Health Psychology (4)
Application of professional psychological principles of practice, theory, and research to work settings. Focus on science and practice drawn from psychology and other disciplines in the promotion and development of workplace health- and safety-related initiatives. Occupational Health Psychology researchers and practitioners draw from the domains of public health, preventive medicine, nursing, industrial engineering, law, epidemiology, and psychology to develop sound theory and practice for protecting and promoting the safety, health, and well being of individuals in occupational settings. Also offered as Psy 550 and may be taken only once for credit.

Psy 654 - Social Psychology of Mental Health (4)
Principles of experimental design, evaluation of research methods, formulation and testing of hypotheses using research procedures, use of statistical software for analyzing the research data, writing a research manuscript using APA form. Also offered as Psy 554 and may be taken only once for credit. Recommended prerequisites: at least 12 credits in psychology including Psy 321 and at least one of the following: Stat 243 and 244.

Psy 666 - Research in Applied Developmental Psychology (4)
Conducted in collaboration with an approved faculty research mentor. Research areas may include prosocial, social, cognitive, and motivational development, attachment, peer groups, parenting, teaching, early literacy, identity, aging, coping, self-system processes, and the social and cross-cultural contexts of development, including the family, schools, and day care. Involves data gathering, analysis, and/or reporting results of research conducted in a field setting. Emphasis on applied issues related to research design, data collection, data analysis, and scientific writing. Also offered as Psy 566 and may be taken only once for credit.

Psy 669 - Research in Applied Social/Community Psychology (4)
Conducted in collaboration with an approved faculty research mentor. Research areas may include social relationships and health behaviors; social relationships and subjective well-being; community-based interventions; self-help groups; social psychological perspectives on social movements; gender issues; family violence; and prevention. Involves data gathering, analysis, and/or reporting results of research conducted in a field setting. Emphasis on applied issues related to research design, data collection, data analysis, and scientific writing. Also offered as Psy 569 and may be taken only once for credit.

Psy 686 - Social Program Evaluation (4)
Foundational concepts in social program evaluation theory and practice including theoretical perspectives on the nature and purpose of program evaluation, phases of program evaluation, ethics and standards of practice, sociopolitical considerations, and proposal and report writing. Also offered as Psy 586 and may be taken only once for credit. Recommended prerequisites: Psy 521/621, Psy 522/622, Psy 524/624.

Psy 689 - Adult Socialization (4)
This course examines the acquisition of social roles in adulthood. Two themes prevail: stages of socialization; and levels of transmission of social norms (cultural, organizational, and interpersonal).
Prerequisite: graduate status. Also offered as Psy 589 and may be taken only once for credit.

Psy 695 - Psychological Measurement (4)
Theories, methods, and implications in the development and validation of measures of psychological constructs. Students will learn about the issues of reliability, validity, item analysis, standardization, and applications of measures via both lectures and hands-on experiences in the lab. Also offered as Psy 595 and may be taken only once for credit. Expected preparation: PSY521/621 or equivalent statistics/method courses.

READ - READOregon

READ 509 - Practicum: ReadOregon (1-3)
The practicum is carried out in schools and/or districts and consists of reading endorsement candidates working directly with students, other faculty, administrators, and the school community to fulfill various roles of the reading specialist. Among the roles to be demonstrated during the practicum are: (1) teaching reading; (2)
literacy testing; (3) developing curriculum for various groups of readers including ELL, struggling, readers, average and/or gifted readers; (4) assessing and making recommendations for a school’s reading program; and (5) developing literacy-focused professional development sessions for faculty, administrators, instructional assistants, and parents.

Prerequisite: The practicum may not be taken until a candidate has completed a minimum of 12 credit hours of coursework in literacy. Typically, the practicum is the final capstone course of the reading endorsement course of study.

**READ 518 - Language and Literacy Development, K-8 (3)**

Examine the connection between early childhood oral language acquisition and the development of reading and writing skills. Discuss relevant language and literacy research, differences in language and literacy development, foundations of language development in the brain and its implication as regards phonological skills, grammatical knowledge, vocabulary, comprehension, and writing.

**READ 519 - Language Study for Teachers, K-12 (3)**

In-depth knowledge in linguistics important to literacy teachers working with all students. Topics include fundamentals in: phonetics and phonology; morphology; syntax; semantics; pragmatics and language use in society; and classroom discourse. Gain important knowledge to facilitate instructional planning and delivery in phonetics instruction, vocabulary development, sentence structure, word meaning and choice in comprehension, questioning strategies, and textual structures for culturally diverse students.

**READ 530 - Reading and Composition in the Content Areas (3)**

Designed for pre-service and in-service teachers to explore literacy strategies in order to guide their students in acquiring skills needed for adequate reading, writing, and study in content areas. Emphasis is on the functional teaching of reading and writing including designing and preparing materials to use with curriculum materials in all school subjects. Designed also to help educators identify and design materials to promote and develop Oregon’s Standard and Benchmark literacy abilities in their students.

**READ 531 - Teaching the Struggling Adolescent Reader (3)**

For middle and high school teachers who want to experience hands-on teaching and learning strategies for improving motivation and learning in the core subject areas. As part of a collaborative effort, teachers will work with each other to develop tutoring plans and activities in curriculum materials to be used in teaching struggling readers in their own classroom. Recommended prerequisites: enrollment in ReadOregon Reading Endorsement program or GSE Literacy or master’s program.

**READ 532 - Writing across the Curriculum, Grades 4-12 (3)**

Learners will explore instructional strategies in order to guide their students in acquiring writing skills in content areas. Emphasis is on the functional teaching of writing, including designing and preparing materials to use with curriculum materials in all school subjects.

**READ 533 - Boy Readers/Boy Writers (3)**

Critically analyze and implement research-based practices in reading and writing as they relate to boys’ learning style. Demonstrate appropriate professional knowledge, skills and dispositions through reading critical theory in instructional strategies that benefit boy’s needs. Use evidence to solve problems of practice and make educational decisions.

**READ 534 - Classroom Reading and Writing Assessment, K-8 (3)**

Examine a variety of literacy assessment vehicles and how they can be used to develop effective instruction. Discuss relevant literacy assessment research and its implications in the classroom. Explore word knowledge, reading fluency, comprehension and composition, Discuss administering and interpreting assessments and their broader uses for increasing student learning.

**READ 540 - Media Literacy: K-12 (1)**

This course is concerned with helping K-12 teachers develop an informed and critical understanding of the nature of mass media, so that they can teach children how to build connections between their learning in the classroom and their use of media outside of school. Participants will develop abilities to access, analyze, evaluate, and communicate information in a variety of formats.

**READ 551 - Literacy Instruction for Special Needs Students K-12 (3)**

Designed to prepare effective and reflective teachers in language and literacy instruction for students with special needs. Participants will explore multiple perspectives, practices, and methodological approaches to literacy instruction which are research-based, and proven effective to promote literacy development. Topics include (but are not limited to): (1) language and literacy development; (2) characteristics of special needs students; (3) framework of effective literacy instruction within context of students with special needs; (4) methods of effective basic literacy skills instruction; (5) methods of teaching comprehension and critical thinking strategies; (6) methods of promoting learning and meta-cognitive strategies for lifelong learning, and (7) methods of appropriate and meaningful assessment.

**READ 554 - Literacy Instruction Strategies with ELL Students, K-12 (3)**

Focuses on research-based effective literacy instruction frameworks and strategies for working with English language learners. Emphasis is placed on frameworks and strategies that promote ELL’s academic and English literacy development in an authentic and culturally responsive environment.

**READ 571 - Principles/Methods of Diagnosis and Assessment K-12 (3)**

Literacy theory (review/overview of the psychological, sociological, and linguistic foundations of reading processes and instruction, including developmental stages of literacy). Psychometrics (the science of measurement in the social sciences). Measures of reading proficiency and reading achievement (with specific examples of standardized reading measures and discrete-point reading proficiency measures). Authentic literacy assessment (with specific examples of authentic reading assessment tasks). Literacy assessment and students with special needs (English language learners, students with learning disabilities, talented and gifted students). Test ethics and how assessment results are used (including communication with various stakeholders). Recommended prerequisites:
enrollment in ReadOregon Reading Endorsement program or GSE Literacy or master’s program.

READ 580 - School Reading Program Leadership (3)
Designed for pre-service and practicing educators who are applying for a reading endorsement or MEd with a reading emphasis, as well as others interested in school leadership. Emphasis is on the functional planning, organization, and management of classroom and school-wide reading programs. Recommended prerequisites: Enrollment in ReadOregon Reading Endorsement program or GSE Literacy or master’s program.

READ 582 - Reading Leadership in Middle and High Schools (3)
Designed for administrators and teachers in leadership roles in middle and high schools. Explores ways to improve reading achievement in schools by identifying the school's existing strengths, apply current research and practice, and creating an action plan. Recommended prerequisites: enrollment in ReadOregon Reading Endorsement program or GSE Literacy or master’s program.

RE - Real Estate
RE 199 - Special Studies (1-8)
(Credit to be arranged.)

RE 360 - Real Estate Finance I (4)
Application of finance and economic principles to analysis of real estate finance and investments. Emphasis on the development of problem solving capabilities through the use of computer application programs. Special attention is given to risk analysis, alternative mortgage instruments, hedging techniques, and the tax effects of real estate investment.

Prerequisite: Ec 201. This course is cross listed as USP 360 and may only be taken once for credit.

RE 399 - Special Studies (1-8)
(Credit to be arranged.)

RE 401 - Research (1-12)
(Credit to be arranged.)

RE 404 - Cooperative Education/Internship (1-12)
(Credit to be arranged.)

RE 405 - Reading and Conference (1-8)
(Credit to be arranged.)

RE 407 - Seminar (1-8)
(Credit to be arranged.)

RE 409 - Practicum (1-8)
(Credit to be arranged.)

RE 410 - Selected Studies (1-8)
(Credit to be arranged.)

RE 431 - Urban Economics (4)
Functions of the urban economy: the market sector and the public sector. Economic analysis of issues such as land use, environmental quality, transportation, housing, income distribution, and the organization and financing of urban public services. This course is the same as Ec 431 and USP 431 and may only be taken once for credit.

Prerequisite: Ec 201, Ec 202 and junior standing. Crosslisted as: Ec 431 and USP 431.

RE 439 - Real Estate Valuation II (3)
Applies concepts from 439/539 to examine case studies in real estate appraisal and valuation. Topics include valuation for financial reporting, determining the highest and best use for a site, and determination of value following a property taking or condemnation. Also offered for graduate-level credit as RE 559 and may be taken only once for credit.

Prerequisite: RE 439 and Fin 319 for undergraduates; RE 539 and RE 521 for graduate students.

RE 459 - Real Estate Valuation II (3)
Applies concepts from 439/539 to examine case studies in real estate appraisal and valuation. Topics include valuation for financial reporting, determining the highest and best use for a site, and determination of value following a property taking or condemnation. Also offered for graduate-level credit as RE 559 and may be taken only once for credit.

Prerequisite: RE 439 and Fin 319 for undergraduates; RE 539 and RE 521 for graduate students.

RE 504 - Cooperative Education/Internship (1-12)
(Credit to be arranged.)

RE 505 - Reading and Conference (1-8)
(Credit to be arranged.)

RE 507 - Seminar (1-8)
(Credit to be arranged.)

RE 509 - Practicum (1-8)
(Credit to be arranged.)

RE 501 - Research (1-12)
(Credit to be arranged.)

RE 504 - Cooperative Education/Internship (1-12)
(Credit to be arranged.)

RE 505 - Reading and Conference (1-8)
(Credit to be arranged.)

RE 507 - Seminar (1-8)
(Credit to be arranged.)

RE 509 - Practicum (1-8)
(Credit to be arranged.)

RE 510 - Selected Studies (1-8)
(Credit to be arranged.)

RE 521 - Real Estate Finance II (4)

RE 501 - Research (1-12)
(Credit to be arranged.)

RE 504 - Cooperative Education/Internship (1-12)
(Credit to be arranged.)

RE 505 - Reading and Conference (1-8)
(Credit to be arranged.)

RE 507 - Seminar (1-8)
(Credit to be arranged.)

RE 509 - Practicum (1-8)
(Credit to be arranged.)

RE 510 - Selected Studies (1-8)
(Credit to be arranged.)

RE 521 - Real Estate Finance I (4)
Introduces business finance within the context of commercial real estate. Concepts and techniques will include financial statements, analysis, and forecasting; present value and discounted cash flow analysis, an introduction to real estate valuation measurements; and analysis of performance risk versus return. Students also receive an overview of the legal definitions of real estate terminology, including title, contract, regulation, and financing issues, and case studies in real
RE 548 - Real Estate Market Analysis (3)
A well-researched market study provides critical information that can make or break a development project. This course will provide students with the tools needed to evaluate trends and understand the key factors affecting real estate markets. The class will demonstrate where to get and analyze information on the demand for multifamily, hotel, office, industrial, and mixed-use developments. Expected preparation: RE 521 or USP 515.

RE 559 - Real Estate Valuation II (3)
Applies concepts from 439/539 to examine case studies in real estate appraisal and valuation. Topics include valuation for financial reporting, determining the highest and best use for a site, and determination of value following a property taking or condemnation. Also offered for undergraduate-level credit as RE 459 and may be taken only once for credit.
Prerequisite: RE 439 and Fin 319 for undergraduates; RE 539 and RE 521 for graduate students.

RE 562 - Real Estate Development Workshop (4)
Students form a real estate development team and produce an origin development plan, including the development concept, the market analysis, the conceptual design, economic analysis capital and operations budget, and management plan. The student's plan will demonstrate mastery of the development concepts and tools learned through the previous courses.
Prerequisite: USP 546 or instructor's consent. Course may be taken twice for credit with instructor's consent.

RE 573 - Housing Economics (4)
Looks at the economics of real estate and housing, including land rent, interest rates, apartment rents, and housing prices, using an economic framework. Basic concepts in urban economics such as land rents, externalities, and public goods are reviewed. Explores the technique most commonly used in real estate and housing economics: hedonic pricing. Explores the rationale and impact of government intervention in the private real estate market. This is the same course as USP 573 and may be taken only once for credit. Expected preparation: USP 515 or Fin 512.
Crosslisted as: USP 573.

RST - Religious Studies
RST 201 - Introduction to Religious Studies I: Introduction to World Religions (4)
Introduction to a number of religious traditions in their classical formulations and their contemporary practices, as well as to the academic study of religion. Prepares students for further academic study in both the humanities and social sciences.

RST 299 - Special Studies (1-4)
(Credit to be arranged.)

RST 301 - Introduction to Religious Studies II: The Study of Religion (4)
Examination of the theories and methods of the academic study of religion. Expected preparation: RST 201.

RST 399 - Special Studies (1-4)
(Credit to be arranged.)

RST 415 - Contemporary Issues in Religious Studies: Tradition, Time, and Place (4)
Examines how religious communities respond to changes arising from the passage of time and patterns of migration. Special attention will be paid to the Portland area.
Prerequisite: RST 201 and RST 301, or consent of instructor.

Rus - Russian
Rus 101 - First-year Russian (4)
An introduction to elementary Russian. Emphasis on listening comprehension and oral practice, the elements of grammar, vocabulary building, and elementary readings. This is the first course in a sequence of three: Rus 101, Rus 102, and Rus 103.

Rus 102 - First-year Russian (4)
An introduction to elementary Russian. Emphasis on listening comprehension and oral practice, the elements of grammar, vocabulary building, and elementary readings. This is the second course in a sequence of three: Rus 101, Rus 102, and Rus 103.
**Rus 150 - Introductory Flagship Russian (6)**

An intensive introduction to fundamentals of Russian focusing on language production in high-frequency settings. Conducted primarily in Russian, the course prepares students for study in Russia and is a prerequisite for further study in the Russian Flagship Program. This is the first course in a sequence of three: Rus 150, Rus 151, and Rus 152.

**Rus 151 - Introductory Flagship Russian (6)**

An intensive introduction to fundamentals of Russian focusing on language production in high-frequency settings. Conducted primarily in Russian, the course prepares students for study in Russia and is a prerequisite for further study in the Russian Flagship Program. This is the second course in a sequence of three: Rus 150, Rus 151, and Rus 152.

**Rus 152 - Introductory Flagship Russian (6)**

Intensive introduction to fundamentals of Russian focusing on language production in high-frequency settings. Conducted primarily in Russian, the course prepares students for study in Russia and is a prerequisite for further study in the Russian Flagship Program. This is the third course in a sequence of three: Rus 150, Rus 151, and Rus 152.

**Rus 111 - Introduction to Flagship Studies (1)**

An introduction to issues related to language acquisition, proficiency standards, and assessment instruments for students in the Russian Flagship Program. This is the first course in a sequence of three: Rus 111, Rus 112, and Rus 113.

Prerequisite: admission to the Russian Flagship Partner Program.

**Rus 112 - Introduction to Flagship Studies (1)**

An introduction to issues related to language acquisition, proficiency standards, and assessment instruments for students in the Russian Flagship Program. This is the second course in a sequence of three: Rus 111, Rus 112, and Rus 113.

Prerequisite: admission to the Russian Flagship Partner Program.

**Rus 113 - Introduction to Flagship Studies (1)**

An introduction to issues related to language acquisition, proficiency standards, and assessment instruments for students in the Russian Flagship Program. This is the third course in a sequence of three: Rus 111, Rus 112, and Rus 113.

Prerequisite: admission to the Russian Flagship Partner Program.

**Rus 103 - First-year Russian (4)**

An introduction to elementary Russian. Emphasis on listening comprehension and oral practice, the elements of grammar, vocabulary building, and elementary readings. This is the first course in a sequence of three: Rus 101, Rus 102, and Rus 103.

**Rus 203H - Second-year Russian Heritage**

Designed for students who speak Russian but have limited writing skills. Covers the content of second-year Russian with particular attention to writing. RUS 203H satisfies the PSU BA requirement and prepares students to enter Rus 301H.

**Rus 201 - Second-year Russian (4)**

Intensive review of basic materials introduced in first-year program and further development of communication skills. This is the first course in a sequence of three: Rus 201, Rus 202, and Rus 203. Recommended prerequisite: Rus 103.

**Rus 202 - Second-year Russian (4)**

Intensive review of basic materials introduced in first-year program and further development of communication skills. This is the second course in a sequence of three: Rus 201, Rus 202, and Rus 203. Recommended prerequisite: Rus 103.

**Rus 201H - Second-year Russian Heritage**

Designed for students who speak Russian but have limited writing skills. Covers the content of second-year Russian with particular attention to writing. RUS 203H satisfies the PSU BA requirement and prepares students to enter Rus 301H.

**Rus 301 - Third-year Russian (4)**

Focus on acquisition of vocabulary, practical application. Intensive practice in speaking, listening, reading and writing. This is the first course in a sequence of three: Rus 301, Rus 302, and Rus 303. Recommended prerequisite: Rus 203.

**Rus 302 - Third-year Russian (4)**

Focus on acquisition of vocabulary, practical application. Intensive practice in speaking, listening, reading and writing. This is the second course in a sequence of three: Rus 301, Rus 302, and Rus 303. Recommended prerequisite: Rus 203.

**Rus 301H - Third-year Russian Heritage**

Designed for students from Russian-speaking backgrounds. Covers the content of third-year Russian with particular attention to culture, stylistic registers, accuracy. Prepares students to enter Rus 411 (Advanced Russian) and to apply for the PSU Russian Language Flagship program.

**Rus 302H - Third-year Russian Heritage**

Designed for students from Russian-speaking backgrounds. Covers the content of third-year Russian with particular attention to culture, stylistic registers, accuracy. Prepares students to enter Rus 411 (Advanced Russian) and to apply for the PSU Russian Language Flagship program.

**Rus 303 - Third-year Russian (4)**

Focus on acquisition of vocabulary, practical application. Intensive practice in speaking, listening, reading and writing. This is the third course in a sequence of three: Rus 301, Rus 302, and Rus 303. Recommended prerequisite: Rus 203.
Rus 303H - Third-year Russian Heritage

Designed for students from Russian-speaking backgrounds. Covers the content of third-year Russian with particular attention to culture, stylistic registers, accuracy. Prepares students to enter Rus 411 (Advanced Russian) and to apply for the PSU Russian Language Flagship program.

Rus 325 - Russian Phonetics and Phonology (4)

Introduction to the sounds of Russian: their place and manner of articulation (phonetics) as well as how they pattern with respect to each other and as influenced by morphological and syntactic factors (phonology). Conducted in English. Recommended prerequisite: Rus 203.

Rus 330 - Russian Culture and Civilization (4)

A multimedia survey of major developments in Russian art, architecture, music, dance, theater, cinema and literature. The class focuses on ways major works relate to the artistic atmosphere of their times and on how subsequent generations have reinterpreted and reused them. Taught in English.

Rus 330U - Russian Culture and Civilization (4)

A multimedia survey of major developments in Russian art, architecture, music, dance, theater, cinema and literature. The class focuses on ways major works relate to the artistic atmosphere of their times and on how subsequent generations have reinterpreted and reused them. Taught in English.

Rus 341 - Introduction to Russian Literature (4)

Study of selected short stories of the 19th century. For non-native speakers only. This is the first course in a sequence of two: Rus 341 and Rus 342. Recommended prerequisite: Rus 203.

Rus 342 - Introduction to Russian Literature (4)

Study of selected short stories of the 19th century. For non-native speakers only. This is the second course in a sequence of two: Rus 341 and Rus 342. Recommended prerequisite: Rus 203.

Rus 399 - Special Studies (1-6)

(Credit to be arranged.)

Rus 401 - Research (1-6)

(Credit to be arranged.)

Rus 404 - Cooperative Education/Internship (1-12)

(Credit to be arranged.)

Rus 405 - Reading and Conference (1-12)

(Credit to be arranged.)

Rus 407 - Seminar (1-12)

(Credit to be arranged.)

Rus 408 - Workshop (1-12)

(Credit to be arranged.)

Rus 409 - Practicum (1-12)

(Credit to be arranged.)

Rus 410 - Selected Topics (1-12)

(Credit to be arranged.)

Rus 411 - Advanced Russian (4)

Special problems of Russian grammar; selected writing and reading assignments and discussion. For non-native speakers of Russian only. This is the first course in a sequence of three: Rus 411, Rus 412, and Rus 413. Also offered for graduate-level credit as Rus 513 and may be taken only once for credit. Recommended prerequisite: Rus 303.

Rus 413 - Advanced Russian (4)

Special problems of Russian grammar; selected writing and reading assignments and discussion. For non-native speakers of Russian only. This is the third course in a sequence of three: Rus 411, Rus 412, and Rus 413. Also offered for graduate-level credit as Rus 513 and may be taken only once for credit. Recommended prerequisite: Rus 303.

Rus 414 - Advanced Russian Grammar (4)

Systematic study of Russian grammar for advanced students and prospective teachers. Also offered for graduate-level credit as Rus 514 and may be taken only once for credit. Recommended prerequisite: Rus 301.

Rus 416 - Readings in Russian (2)

A variable-content course designed to give advanced students of Russian experience reading in a variety of content areas. Rus 416 is to be taken in conjunction with regularly scheduled corequisite courses. Students taking a corequisite course will do part of the required reading for that course in Russian. Recommended prerequisite: Rus 342.

Rus 420 - Topics in Russian History (4)

A content-based language course based on study of major issues in Russian and Soviet history such as Peter I, Westerners and Slavophiles, the Thaw, and others. Also offered for graduate-level credit as Rus 520 and may be taken only once for credit. Expected preparation: Rus 342. Prerequisite: junior standing. May be repeated for credit when topics differ.

Rus 421 - Topics in Contemporary Russian Culture (4)

Study of current issues in post-Soviet society such as political processes, educational reform, migration, and others. Also offered for graduate-level credit as Rus 521 and may be taken only once for credit. Recommended prerequisite Rus 342. May be repeated for credit when topics differ.

Rus 427 - Topics in Russian Literature of the 19th Century (4)

Representative literature of the major Russian writers of the nineteenth century. Such topics as Golden Age, or the 19th Century Short Story. Also offered for
Rus 433 - Topics in Russian Literature of the 20th Century (4)
Representative literature of major Russian writers of the twentieth century. Such topics as Soviet Satire, The Thaw, Glasnost. Also offered for graduate-level credit as Rus 533 and may be taken only once for credit. Recommended prerequisite: Rus 303. May be repeated for credit when topic differs.

Rus 441 - Russian Literature in Translation: Nineteenth Century (4)
Major works of nineteenth-century Russian literature. Readings, lectures, and discussion in English.

Rus 441U - Russian Literature in Translation: Nineteenth Century (4)
Major works of nineteenth-century Russian literature. Readings, lectures, and discussion in English. Recommended prerequisite: Sophomore Inquiry or 4 credits of upper division literature.

Rus 442 - Russian Literature in Translation: Twentieth Century (4)
Major works of twentieth-century Russian literature. Readings, lectures, and discussions in English.

Rus 442U - Russian Literature in Translation: Twentieth Century (4)
Major works of twentieth-century Russian literature. Readings, lectures, and discussions in English. Recommended prerequisite: Sophomore Inquiry or 4 credits of upper division literature.

Rus 444 - Flagship Studies: Globalization (2)
A Russian across the curriculum course aligned with PSU's University Studies Program. Flagship students develop advanced reading, writing, speaking and listening skills while exploring “Globalization” in Russian. This is the first course in a sequence of three: Rus 444, Rus 445, and Rus 446.
Prerequisite: admission to the Russian Flagship Program.

Rus 445 - Flagship Studies: Globalization (2)
A Russian across the curriculum course aligned with PSU's University Studies Program. Flagship students develop advanced reading, writing, speaking and listening skills while exploring “Globalization” in Russian. This is the second course in a sequence of three: Rus 444, Rus 445, and Rus 446.
Prerequisite: admission to the Russian Flagship Program.

Rus 446 - Flagship Studies: Globalization (2)
A Russian across the curriculum course aligned with PSU's University Studies Program. Flagship students develop advanced reading, writing, speaking and listening skills while exploring “Globalization” in Russian. This is the third course in a sequence of three: Rus 444, Rus 445, and Rus 446.
Prerequisite: admission to the Russian Flagship Program.

Rus 454 - Flagship Studies: American Studies (2)
A Russian across the curriculum course aligned with PSU's University Studies Program. Flagship students perfect advanced reading, writing, speaking and listening skills while exploring the U.S. Jazz Age in Russian.
Prerequisite: admission to the Russian Flagship Program.

Rus 455 - Flagship Studies: European Studies (2)
A Russian across the curriculum course aligned with PSU's University Studies Program. Flagship students perfect advanced reading, writing, speaking and listening skills while exploring the modern European history and culture in Russian.
Prerequisite: admission to the Russian Flagship Program.

Rus 457 - Flagship Studies: Russian in the Major (2)
A Russian across the curriculum course designed to permit advanced Flagship students to develop appropriate vocabulary, discourse strategies, and research skills in their respective majors. This is the first course in a sequence of three: Rus 457, Rus 458, and Rus 459.
Prerequisite: admission to the Russian Flagship Program.

Rus 458 - Flagship Studies: Russian in the Major (2)
A Russian across the curriculum course designed to permit advanced Flagship students to develop appropriate vocabulary, discourse strategies, and research skills in their respective majors. This is the third course in a sequence of three: Rus 457, Rus 458, and Rus 459.
Prerequisite: admission to the Russian Flagship Program.

Rus 459 - Flagship Studies: Russian in the Major (2)
A Russian across the curriculum course designed to permit advanced Flagship students to develop appropriate vocabulary, discourse strategies, and research skills in their respective majors.
Prerequisite: admission to the Russian Flagship Program.

Rus 494 - Russian Linguistics (4)
Introduction to the basic concepts of linguistics and their application to Russian. Analysis of the phonetics, phonemics, syntax and morphology of modern Russian. Recommended prerequisite: Rus 303.

Rus 497 - Applied Russian Linguistics (4)
A practical application of linguistics to modern Russian. Emphasis on a contrastive analysis of the structures of Russian and English. Recommended prerequisite: Rus 303.

Rus 501 - Research (1-9)
(Credit to be arranged.)

Rus 504 - Cooperative Education/Internship (1-9)
(Credit to be arranged.)
Rus 505 - Reading and Conference (1-12)
(Credit to be arranged.)

Rus 507 - Seminar (1-12)
(Credit to be arranged.)

Rus 508 - Workshop (1-8)
(Credit to be arranged.)

Rus 509 - Practicum (1-6)
(Credit to be arranged.)

Rus 510 - Selected Topics (1-12)
(Credit to be arranged.)

Rus 511 - Advanced Russian (4)
Special problems of Russian grammar; selected writing and reading assignments and discussion. For non-native speakers of Russian only. This is the first course in a sequence of three: Rus 511, Rus 512, and Rus 513. Also offered for undergraduate-level credit as Rus 411 and may be taken only once for credit. Recommended prerequisite: Rus 303.

Rus 512 - Advanced Russian (4)
Special problems of Russian grammar; selected writing and reading assignments and discussion. For non-native speakers of Russian only. This is the second course in a sequence of three: Rus 511, Rus 512, and Rus 513. Also offered for undergraduate-level credit as Rus 412 and may be taken only once for credit. Recommended prerequisite: Rus 303.

Rus 513 - Advanced Russian (4)
Special problems of Russian grammar; selected writing and reading assignments and discussion. For non-native speakers of Russian only. This is the third course in a sequence of three: Rus 511, Rus 512, and Rus 513. Also offered for undergraduate-level credit as Rus 413 and may be taken only once for credit. Recommended prerequisite: Rus 303.

Rus 514 - Advanced Russian Grammar (4)
Systematic study of Russian grammar for advanced students and prospective teachers. Also offered for undergraduate-level credit as Rus 414 and may be taken only once for credit. Recommended prerequisite: Rus 301.

Rus 520 - Topics in Russian History (4)
A content-based language course based on study of major issues in Russian and Soviet history such as Peter I, Westerners and Slavophiles, the Thaw, and others. Also offered for undergraduate-level credit as Rus 420 and may be taken only once for credit. Expected preparation: Rus 342.
Prerequisite: junior standing. May be repeated for credit when topics differ.

Rus 521 - Topics in Contemporary Russian Culture (4)
Study of current issues in post-Soviet society such as political processes, educational reform, migration, and others. Also offered for undergraduate-level credit as Rus 421 and may be taken only once for credit. Recommended prerequisite Rus 342. May be repeated for credit when topics differ.

Rus 527 - Topics in Russian Literature of the 19th Century (4)
Representative literature of the major Russian writers of the nineteenth century. Such topics as Golden Age, or the 19th Century Short Story. Also offered for undergraduate-level credit as Rus 427 and may be taken only once for credit. Recommended prerequisite: Rus 303.

Rus 533 - Topics in Russian Literature of the 20th Century (4)
Representative literature of major Russian writers of the twentieth century. Such topics as Soviet Satire, The Thaw, Glasnost. Also offered for undergraduate-level credit as Rus 433 and may be taken only once for credit. Recommended prerequisite: Rus 303. May be repeated for credit when topics differ.

Rus 594 - Russian Linguistics (4)
Introduction to the basic concepts of linguistics and their application to Russian. Analysis of the phonetics, phonemics, syntax and morphology of modern Russian. Recommended prerequisite: Rus 303.

Rus 597 - Applied Russian Linguistics (4)
A practical application of linguistics to modern Russian. Emphasis on a contrastive analysis of the structures of Russian and English. Recommended prerequisite: Rus 303.

Sci - Science Ed: Center for

Sci 199 - Special Studies (1-8)
(Credit to be arranged.)

Sci 201 - Natural Science Inquiry (4)
This is the University Studies Sophomore Inquiry course that serves as the gateway to the Science in the Liberal Arts curriculum. The course aims to introduce students to the knowledge-making strategies of science. The curriculum is taught using small group and class projects that engage students in various science inquiry activities. Students gain experience in gathering and understanding scientific information, data management, interpretation and presentation, making and defending knowledge claims, working collaboratively, writing technically, and communicating scientific results.

Sci 311 - Teaching Everyday Science (4)
Two-term sequence designed to immerse potential mathematics and science teachers in laboratory and thinking experiences that they can use as a foundation for their own understanding of the physical sciences and related mathematics and curriculum development in future teaching experiences. In addition to experiences in the laboratory, environmental impact issues will be investigated. Includes laboratory and/or fieldwork. This is the first course in a sequence of two: Sci 311 and Sci 312.

Sci 311U - Teaching Everyday Science (4)
Two-term sequence designed to immerse potential mathematics and science teachers in laboratory and thinking experiences that they can use as a foundation for their own understanding of the physical sciences and related mathematics and curriculum development in future teaching experiences. In addition to experiences in the laboratory, environmental impact issues will be investigated. Includes laboratory and/or fieldwork. This is the first course in a sequence of two: Sci 311 and Sci 312.
related mathematics and curriculum development in future teaching experiences. In addition to experiences in the laboratory, environmental impact issues will be investigated. Includes laboratory and/or fieldwork. This is the second course in a sequence of two: Sci 311 and Sci 312.

Sci 312U - Teaching Everyday Science (4)
Two-term sequence designed to immerse potential mathematics and science teachers in laboratory and thinking experiences that they can use as a foundation for their own understanding of the physical sciences and related mathematics and curriculum development in future teaching experiences. In addition to experiences in the laboratory, environmental impact issues will be investigated. Includes laboratory and/or fieldwork. This is the second course in a sequence of two: Sci 311 and Sci 312. Recommended prerequisite: Natural Science Inquiry.

Sci 315U - Teaching Everyday Science (4)
An introduction to differential and integral calculus, this course is intuitive in approach and emphasizes applications, especially with respect to environmental issues. The interested student may follow it with a more extensive and rigorous calculus sequence. Includes laboratory and/or fieldwork.

Sci 316U - Teaching Everyday Science (4)
An introduction to differential and integral calculus, this course is intuitive in approach and emphasizes applications, especially with respect to environmental issues. The interested student may follow it with a more extensive and rigorous calculus sequence. Includes laboratory and/or fieldwork. Recommended prerequisite: Natural Science Inquiry, Mth 95.

Sci 315 - General Astronomy I (4)
Introductory historical, descriptive, and interpretive study of astronomy. Emphasis is on the basic scientific methods as they apply to astronomical problems. Detailed examination of the earth, followed by a survey of the other members of the solar system. Survey of the stars, their types, grouping, and motions. Models for the evolution of the Universe and the possibility of life elsewhere. The nature of light, the types of information it carries, and the types of devices used to detect it. Includes laboratory and/or fieldwork. This is the first course in a sequence of two: Sci 315 and Sci 316.

Sci 316 - General Astronomy II (4)
Introductory historical, descriptive, and interpretive study of astronomy. Emphasis is on the basic scientific methods as they apply to astronomical problems. Detailed examination of the earth, followed by a survey of the other members of the solar system. Survey of the stars, their types, grouping, and motions. Models for the evolution of the Universe and the possibility of life elsewhere. The nature of light, the types of information it carries, and the types of devices used to detect it. Includes laboratory and/or fieldwork. This is the second course in a sequence of two: Sci 315 and Sci 316.

Sci 316U - General Astronomy II (4)
Introductory historical, descriptive, and interpretive study of astronomy. Emphasis is on the basic scientific methods as they apply to astronomical problems. Detailed examination of the earth, followed by a survey of the other members of the solar system. Survey of the stars, their types, grouping, and motions. Models for the evolution of the Universe and the possibility of life elsewhere. The nature of light, the types of information it carries, and the types of devices used to detect it. Includes laboratory and/or fieldwork. This is the second course in a sequence of two: Sci 315 and Sci 316. Recommended prerequisite: Natural Science Inquiry. Taught by a faculty member from the Department of Physics.

Sci 317 - Fractals, Chaos, and Complexity (4)
Introduction to the physics of fractals in nature, chaos, and complexity. Computer simulations and desktop experiments involving fractals, chaos, and complex systems.

Sci 317U - Fractals, Chaos, and Complexity (4)
Introduction to the physics of fractals in nature, chaos, and complexity. Computer simulations and desktop experiments involving fractals, chaos, and complex systems. Recommended prerequisite: Natural Science Inquiry. Taught by a faculty member from the Department of Physics.

Sci 318 - Complexity and the Universe I (4)
Introduction to the physics of complexity and other current concepts in physics. Computer simulations and desktop experiments involving fractals, chaos, and complex systems. Includes laboratory and/or fieldwork.

Sci 318U - Complexity and the Universe I (4)
Introduction to the physics of complexity and other current concepts in physics. Computer simulations and desktop experiments involving fractals, chaos, and complex systems. Includes laboratory and/or fieldwork. Recommended prerequisite: Natural Science Inquiry. Taught by a faculty member from the Department of Physics.

Sci 319 - Complexity and the Universe II (4)
Continuation of Sci 318/Ph 366. Emphasizes scientific cosmology with a focus on
understanding how insights gained from physics and astronomy affect your view of the universe and your place in it. Students participate actively in seeing how some of the information was gathered, help critically analyze what to believe about the history and arrangement of the universe and what it means to them. Includes laboratory and/or fieldwork.

Sci 319U - Complexity and the Universe II (4)
Continuation of Sci 318/Ph 366. Emphasizes scientific cosmology with a focus on understanding how insights gained from physics and astronomy affect your view of the universe and your place in it. Students participate actively in seeing how some of the information was gathered, help critically analyze what to believe about the history and arrangement of the universe and what it means to them. Includes laboratory and/or fieldwork. Recommended prerequisite: Natural Science Inquiry. Taught by a faculty member from the Department of Physics.

Sci 320 - Rates of Change (4)
Explores rates of change in a laboratory-style format. Analyzes the relationships between quantities and rates using hand-drawn and computer-generated graphic representations. Provides resources for pre-service teachers.

Sci 320U - Rates of Change (4)
Explores rates of change in a laboratory-style format. Analyzes the relationships between quantities and rates using hand-drawn and computer-generated graphic representations. Provides resources for pre-service teachers.

Sci 321 - Energy and Society I (4)
Study of the generation and usage of energy, including the technical, economic, social, and political issues related to energy production and end uses. Examination of energy resources, methods of producing and converting various forms of energy, energy conservation, and environmental and economic implications of energy production and energy policies. Includes laboratory and possibly fieldwork. This is the first course in a sequence of two: Sci 321 and Sci 322. Recommended prerequisite: Natural Science Inquiry.

Sci 322 - Energy and Society II (4)
Study of the generation and usage of energy, including the technical, economic, social, and political issues related to energy production and end uses. Examination of energy resources, methods of producing and converting various forms of energy, energy conservation, and environmental and economic implications of energy production and energy policies. Includes laboratory and possibly fieldwork. This is the second course in a sequence of two: Sci 321 and Sci 322.

Sci 322U - Energy and Society II (4)
Study of the generation and usage of energy, including the technical, economic, social, and political issues related to energy production and end uses. Examination of energy resources, methods of producing and converting various forms of energy, energy conservation, and environmental and economic implications of energy production and energy policies. Includes laboratory and possibly fieldwork. This is the second course in a sequence of two: Sci 321 and Sci 322. Recommended prerequisite: Natural Science Inquiry.

Sci 325 - Science of a Hydrogen Economy (4)
Hydrogen is considered as an ideal energy source. Explores various methods of hydrogen production, storage, delivery, and uses. Includes discussion of hydrogen's image as an abundant, clean, high energy output, easily obtainable, safe energy source. Considers safety issues and codes/standards from various related agencies and organizations that would have been necessary to have avoided such historical mishaps as those involving the Hindenberg and the space shuttle Challenger.

Sci 325U - Science of a Hydrogen Economy (4)
Hydrogen is considered as an ideal energy source. Explores various methods of hydrogen production, storage, delivery, and uses. Includes discussion of hydrogen's image as an abundant, clean, high energy output, easily obtainable, safe energy source. Considers safety issues and codes/standards from various related agencies and organizations that would have been necessary to have avoided such historical mishaps as those involving the Hindenberg and the space shuttle Challenger.

Sci 332 - AI: Urban Air Pollution (4)
Interaction of the atmosphere with other earth systems, chemical cycling, and the effect of humans on the atmosphere will be explored. The physical and chemical properties and interactions of the atmosphere will be investigated through laboratory investigations, fieldwork, and computer modeling. Topics will include urban air quality, global climate change, and the "management" of the atmosphere. Includes laboratory and/or fieldwork. This is the second course in a sequence of two: Sci 331 and Sci 332.

Sci 332U - AI: Urban Air Pollution (4)
Interaction of the atmosphere with other earth systems, chemical cycling, and the effect of humans on the atmosphere will be explored. The physical and chemical properties and interactions of the atmosphere will be investigated through laboratory investigations, fieldwork, and computer modeling. Topics will include urban air quality, global climate change, and the "management" of the atmosphere. Includes laboratory and/or fieldwork. This is the second course in a sequence of two: Sci 331 and Sci 332. Recommended prerequisite: Natural Science Inquiry.

Sci 333 - Climate and Water Resources (4)
An inquiry-based examination of the principal controls on climate and hydrology, with emphasis on processes and interactions; students will do fieldwork, data analysis, and laboratory work. Crosslisted as: Geog 310.

Sci 333U - Climate and Water Resources (4)
An inquiry-based examination of the principal controls on climate and hydrology, with emphasis on processes and interactions; students will do fieldwork, data analysis, and laboratory work. Recommended prerequisite: Natural Science Inquiry. Also listed as Geog 310; course may be taken only once for credit. Crosslisted as: Geog 310U.

Sci 334 - Climate Variability (4)
Examines the role of climate variability in the Pacific Northwest, including the nature of natural and human-induced variability and the effects on water resources of the region. Students will learn by gathering data, analyzing the data, and reporting on their results. Reading and discussion will accompany the data/laboratory portions of the course. Includes laboratory and/or fieldwork.

Sci 334U - Climate Variability (4)
Examines the role of climate variability in the Pacific Northwest, including the nature of natural and human-induced variability and the effects on water resources of the region. Students will learn by gathering data, analyzing the data, and reporting on their results. Reading and discussion will accompany the data/laboratory portions of the course. Includes laboratory and/or fieldwork. Recommended prerequisite: Geog 310; course may be taken only once for credit.

Sci 335 - Water in the Environment I (4)
Studies of the unique properties of water in all of its roles, including a study of the water cycle, water resources, treatment of municipal water, and wastewater treatment. Special attention will be placed on natural waters as a resource, including natural and introduced constituents and the movements of natural waters. Includes laboratory and fieldwork. This is the first course in a sequence of two: Sci 335 and Sci 336.

Sci 335U - Water in the Environment I (4)
Studies of the unique properties of water in all of its roles, including a study of the water cycle, water resources, treatment of municipal water, and wastewater treatment. Special attention will be placed on natural waters as a resource, including natural and introduced constituents and the movements of natural waters. Includes laboratory and fieldwork. This is the first course in a sequence of two: Sci 335 and Sci 336. Recommended prerequisite: Natural Science Inquiry.

Sci 336 - Water in the Environment II (4)
Studies of the unique properties of water in all of its roles, including a study of the water cycle, water resources, treatment of municipal water, and wastewater treatment. Special attention will be placed on natural waters as a resource, including natural and introduced constituents and the movements of natural waters. Includes laboratory and fieldwork. This is the second course in a sequence of two: Sci 335 and Sci 336.

Sci 336U - Water in the Environment II (4)
Studies of the unique properties of water in all of its roles, including a study of the water cycle, water resources, treatment of municipal water, and wastewater treatment. Special attention will be placed on natural waters as a resource, including natural and introduced constituents and the movements of natural waters. Includes laboratory and fieldwork. This is the second course in a sequence of two: Sci 335 and Sci 336. Recommended prerequisite: Natural Science Inquiry.

Sci 338 - Investigating Forest Ecosystems (4)
Fundamental concepts of terrestrial ecology in the context of present unresolved forest management issues. Participants will learn an appropriate set of field skills in soil and vegetation monitoring and engage in a short-term research project at a local site. Socio-political context of Pacific Northwest forest management will be covered through guided controversies and guest speakers. Prerequisite: one ecology or environmental science course.

Sci 338U - Investigating Forest Ecosystems (4)
Fundamental concepts of terrestrial ecology in the context of present unresolved forest management issues. Participants will learn an appropriate set of field skills in soil and vegetation monitoring and engage in a short-term research project at a local site. Socio-political context of Pacific Northwest forest management will be covered through guided controversies and guest speakers. Prerequisite: one ecology or environmental science course.

Sci 341 - Biology Concepts and Applications I (4)
Two-term course focusing on four main topics: classical Mendelian and current molecular genetics, evolution and predator/prey interactions, growth and metabolism, and biomes and biodiversity. In each topic area students will participate in laboratory and/or field components, discussion, and Internet exercises. Includes laboratory and/or fieldwork. This is the first course in a sequence of two: Sci 341 and Sci 342.
They will gain an understanding of how
forest, and grassland plant communities.

Sci 343U - Columbia Basin Plant Communities (4)
In this two-term course students will explore
the relationships found in alpine, desert,
forest, and grassland plant communities.
They will gain an understanding of how
these plant communities interact with their
environment and why they exhibit certain
characteristics and processes. Includes
laboratory and fieldwork.

Sci 345 - Old Growth Forest Ecology and
Management I (4)
Explores the ecological characteristics of old
growth forests, including the outstanding
biodiversity that exists at multiple levels, as
well as the management paradigms that
have impacted these systems in the Pacific
Northwest (U.S. and Canada), including
ethical, social, economic, and political
aspects of forest management. Sci 345
includes laboratory and local fieldwork plus
projects involving: analysis of environmental
impact statement alternatives, evaluation of
management issues, and advisory
statements for governmental activities. Sci
346 involves more extensive fieldwork, data
analysis, and presentations. This is the
second course in a sequence of two: Sci 345
and Sci 346.

Sci 345U - Old Growth Forest Ecology and
Management II (4)
Explores the ecological characteristics of old
growth forests, including the outstanding
biodiversity that exists at multiple levels, as
well as the management paradigms that
have impacted these systems in the Pacific
Northwest (U.S. and Canada), including
ethical, social, economic, and political
aspects of forest management. Sci 345
includes laboratory and local fieldwork plus
projects involving: analysis of environmental
impact statement alternatives, evaluation of
management issues, and advisory
statements for governmental activities. Sci
346 involves more extensive fieldwork, data
analysis, and presentations. This is the
second course in a sequence of two: Sci 345
and Sci 346. Recommended prerequisite: Natural
Science Inquiry.

Sci 347 - Science, Gender, and Social
Context I (4)
Two-term course explores the strengths and
limitations of science to describe and predict
nature through laboratory and field
investigations. These activities will illustrate
the transition from a reductionist view of our
natural environment to a systems-oriented
view. It will place this historical shift in
understanding and scientific practice in the
contexts of gender, race, and class using
selected case studies in environmental
management. Includes laboratory and/or
fieldwork. This is the same course as WS 347
and may be taken only once for credit. This
is the first course in a sequence of two: Sci 347 and Sci 348.

Crosslisted as: WS 347.

Sci 347U - Science, Gender, and Social Context I (4)

Two-term course explores the strengths and limitations of science to describe and predict nature through laboratory and field investigations. These activities will illustrate the transition from a reductionist view of our natural environment to a systems-oriented view. It will place this historical shift in understanding and scientific practice in the contexts of gender, race, and class using selected case studies in environmental management. Includes laboratory and/or fieldwork. This is the same course as WS 347 and may be taken only once for credit. This is the first course in a sequence of two: Sci 347 and Sci 348. Recommended prerequisite: Natural Science Inquiry.

Crosslisted as: WS 347U.

Sci 348 - Science, Gender, and Social Context II (4)

Two-term course explores the strengths and limitations of science to describe and predict nature through laboratory and field investigations. These activities will illustrate the transition from a reductionist view of our natural environment to a systems-oriented view. It will place this historical shift in understanding and scientific practice in the contexts of gender, race, and class using selected case studies in environmental management. Includes laboratory and/or fieldwork. This is the same course as WS 348 and may be taken only once for credit. This is the second course in a sequence of two: Sci 347 and Sci 348.

Crosslisted as: WS 348.

Sci 348U - Science, Gender, and Social Context II (4)

Two-term course explores the strengths and limitations of science to describe and predict nature through laboratory and field investigations. These activities will illustrate the transition from a reductionist view of our natural environment to a systems-oriented view. It will place this historical shift in understanding and scientific practice in the contexts of gender, race, and class using selected case studies in environmental management. Includes laboratory and/or fieldwork. This is the same course as WS 348 and may be taken only once for credit. This is the second course in a sequence of two: Sci 347 and Sci 348. Recommended prerequisite: Natural Science Inquiry.

Sci 350 - Context of Science in Society (4)

Addresses the promises and limitations of the scientific enterprise in the framework of "real world" social, economic, political, and ethical issues. Courses also address the historical and cultural role of science and technology, providing a link between laboratory science and contemporary society. Some CSS courses introduce risk-benefit analyses and decision-making methodologies. The prerequisite course for Context of Science in Society courses is Sci 201 Natural Science Inquiry or consent of the instructor.

Sci 350U - Context of Science in Society (4)

Addresses the promises and limitations of the scientific enterprise in the framework of "real world" social, economic, political, and ethical issues. Courses also address the historical and cultural role of science and technology, providing a link between laboratory science and contemporary society. Some CSS courses introduce risk-benefit analyses and decision-making methodologies. The prerequisite course for Context of Science in Society courses is Sci 201 Natural Science Inquiry or consent of the instructor.

Sci 352 - Science and Policy of Climate Change (4)

Evaluates the scientific data and the policy statements concerning the potential for human impact of climate, and in particular the questions of the existence and impacts of global warming. The interaction between scientific analysis and policy analysis will be explored, and students will consider the roles that citizens, scientists, and policy make in developing local, regional, and global responses to climate change.

Sci 352U - Science and Policy of Climate Change (4)

Evaluates the scientific data and the policy statements concerning the potential for human impact of climate, and in particular the questions of the existence and impacts of global warming. The interaction between scientific analysis and policy analysis will be explored, and students will consider the roles that citizens, scientists, and policy make in developing local, regional, and global responses to climate change.

Sci 353 - Radiation in the Environment (4)

Examines various sources of radiation and the hazards they represent. Students will consider the interaction of radiation with matter, especially living tissue, and an examination of "safe" dosage estimates and health risks. The science and policy of nuclear power generation and the problems of nuclear waste disposal will be considered.

Sci 353U - Radiation in the Environment (4)

Examines various sources of radiation and the hazards they represent. Students will consider the interaction of radiation with matter, especially living tissue, and an examination of "safe" dosage estimates and health risks. The science and policy of nuclear power generation and the problems of nuclear waste disposal will be considered. Recommended prerequisite: Natural Science Inquiry. Also listed as Ph 353; course may be taken only once for credit.

Sci 354 - Science and Politics of Columbia River Decisions (4)

Exploration of case studies of relationships between science and politics in making decisions about controversial Columbia River management issues. Students will identify a particular issue and its related stakeholders,
define objectives, collect as well as analyze scientific data and political positions, and participate in role-playing decisions as stakeholder groups and as management committees.

Prerequisite: Natural Science Inquiry.

Sci 354U - Science and Politics of Columbia River Decisions (4)
Exploration of case studies of relationships between science and politics in making decisions about controversial Columbia River management issues. Students will identify a particular issue and its related stakeholders, define objectives, collect as well as analyze scientific data and political positions, and participate in role-playing decisions as stakeholder groups and as management committees.

Prerequisite: Natural Science Inquiry.

Sci 355 - Science Through Science Fiction (4)
This class uses science fiction literature to examine a wide variety of topics in science.

Sci 355U - Science Through Science Fiction (4)
This class uses science fiction literature to examine a wide variety of topics in science. Recommended prerequisite: Natural Science Inquiry. Also listed as Ph 378; course may be taken only once for credit.

Sci 357 - Sustainability in the United States-Mexico Border Region (4)
Explores environmental and economic sustainability issues at the United States-Mexico border. Dialogue with United States and Mexican border residents; tours of immigration facilities and multinational factories; homestays with working class families; and service with Mexican-based agencies. Spanish language skills not required.

Sci 357U - Sustainability in the United States-Mexico Border Region (4)
Explores environmental and economic sustainability issues at the United States-Mexico border. Dialogue with United States and Mexican border residents; tours of immigration facilities and multinational factories; homestays with working class families; and service with Mexican-based agencies. Spanish language skills not required.

Sci 359 - Biopolitics (4)
Designed to introduce the ethical, social, and political implications of knowledge and technologies attending advances in reproductive medicine and molecular genetics, including: in vitro fertilization, fetal surgery, and somatic cell gene therapy. Particular attention is paid to the manner in which such advances are likely to affect women’s lives.

Sci 359U - Biopolitics (4)
Designed to introduce the ethical, social, and political implications of knowledge and technologies attending advances in reproductive medicine and molecular genetics, including: in vitro fertilization, fetal surgery, and somatic cell gene therapy. Particular attention is paid to the manner in which such advances are likely to affect women’s lives. Recommended prerequisite: Natural Science Inquiry.

Sci 361 - Science: Power-Knowledge (4)
Systematically examines orthodox portrayals of science in comparison to recent anthropological, feminist, and poststructuralist accounts in an attempt to formulate a fresh understanding of the public’s science literacy as a critical component of democratic political practice and civic responsibility.

Sci 361U - Science: Power-Knowledge (4)
Systematically examines orthodox portrayals of science in comparison to recent anthropological, feminist, and poststructuralist accounts in an attempt to formulate a fresh understanding of the public’s science literacy as a critical component of democratic political practice and civic responsibility. Recommended prerequisite: Natural Science Inquiry.

Sci 365 - The Science of Women’s Bodies (4)
The female human body is studied from a multidisciplinary perspective including anatomy, physiology, genetics, cell biology, endocrinology and human development, as well as biochemistry. Current social, cultural and political topics related to the science and policy of women’s health are also discussed. This course is the same as WS 365; may only be taken once for credit.

Crosslisted as: WS 365U.

Sci 372 - Nanotechnology, Society and Sustainability (4)
Introduction to ethical, legal, and social issues associated with nanotechnology. Critically evaluates implications and applications of nanotechnology to environmental and human health concerns, in local and global contexts. Addresses nanotechnology’s impact on the economic, environmental, and social aspects of sustainability. This is the same course as Bi 372 and may be taken only once for credit.

Crosslisted as: Bi 372.

Sci 372U - Nanotechnology, Society and Sustainability (4)
Introduction to ethical, legal, and social issues associated with nanotechnology. Critically evaluates implications and applications of nanotechnology to environmental and human health concerns, in local and global contexts. Addresses nanotechnology’s impact on the economic, environmental, and social aspects of sustainability. This is the same course as Bi 372 and may be taken only once for credit.

Crosslisted as: Bi 372U.

Sci 382 - Introduction to Nanoscience and Nanotechnology (4)
Basic introduction to nanoscience and nanotechnology for all interested science, engineering and social science and humanities students. This is the same course as Ph 382 and may be taken only once for credit.

Prerequisite: sophomore inquiry - Natural Science Inquiry. Crosslisted as: Ph 382.

Sci 382U - Introduction to Nanoscience and Nanotechnology (4)
Basic introduction to nanoscience and nanotechnology for all interested science,
engineering and social science and humanities students. This is the same course as Ph 382 and may be taken only once for credit.

Prerequisite: sophomore inquiry - Natural Science Inquiry. Crosslisted as: Ph 382U.

Sci 383 - Nanotechnology: Simulation & Design (4)
Introductory circuit simulation; properties of selected nanotechnology devices and systems; nanodevice simulation; development of nanodevice models. This is the same course as ECE 383 and may be taken only once for credit.

Prerequisite: upper-division standing or permission of the instructor. Crosslisted as: ECE 383.

Sci 383U - Nanotechnology: Simulation & Design (4)
Introductory circuit simulation; properties of selected nanotechnology devices and systems; nanodevice simulation; development of nanodevice models. This is the same course as ECE 383 and may be taken only once for credit.

Prerequisite: upper-division standing or permission of the instructor. Crosslisted as: ECE 383U.

Sci 399 - Special Studies (1-5)
(Credit to be arranged.)

Sci 401 - Research (1-8)
(Credit to be arranged.)

Sci 402 - Independent Study (1-8)
(Credit to be arranged.)

Sci 404 - Cooperative Education/Internship (1-12)
(Credit to be arranged.)

Sci 405 - Reading and Conference (1-8)
(Credit to be arranged.)

Sci 407 - Seminar (1-8)
(Credit to be arranged.)

Sci 409 - Practicum (1-12)
(Credit to be arranged.)

Sci 410 - Selected Topics (1-8)
(Credit to be arranged.)

Sci 415 - Understanding the Next Generation Science Standards: Energy and Matter (4)
This course will provide current and future teachers with the science content knowledge they will need to teach science as presented in the Next Generation Science Standards (NGSS) at the elementary level. The course will be conducted through an integrated program of short lectures, labs, and student projects. Also offered for graduate-level credit as Sci 515 and may be taken only once for credit.

Prerequisite: upper-division standing.

Sci 416 - Understanding the Next Generation Science Standards: Change Over Time (4)
This course will provide current and future teachers with the science content knowledge they will need to teach science as presented in the Next Generation Science Standards (NGSS) at the elementary level. The course will be conducted through an integrated program of short lectures, labs, and student projects. Also offered for graduate-level credit as Sci 516 and may be taken only once for credit.

Prerequisite: upper-division standing.

Sci 417 - Understanding the Next Generation Science Standards: Interactions and Systems (4)
This course will provide current and future teachers with the science content knowledge they will need to teach science as presented in the Next Generation Science Standards (NGSS) at the elementary level. The course will be conducted through an integrated program of short lectures, labs, and student projects. Also offered for graduate-level credit as Sci 517 and may be taken only once for credit.

Prerequisite: upper-division standing.

Sci 504 - Cooperative Education/Internship (1-12)
(Credit to be arranged.)

Sci 505 - Reading and Conference (1-8)
(Credit to be arranged.)

Sci 506 - Special Projects (1-12)
(Credit to be arranged.)

Sci 507 - Seminar (1-8)
(Credit to be arranged.)

Sci 509 - Practicum (1-12)
(Credit to be arranged.)

Sci 510 - Selected Topics (0-8)
(Credit to be arranged.)

Sci 515 - Understanding the Next Generation Science Standards: Energy and Matter (4)
This course will provide current and future teachers with the science content knowledge they will need to teach science as presented in the Next Generation Science Standards (NGSS) at the elementary level. The course will be conducted through an integrated program of short lectures, labs, and student projects. Also offered for undergraduate-level credit as Sci 415 and may be taken only once for credit.

Prerequisite: upper-division standing.

Sci 516 - Understanding the Next Generation Science Standards: Change Over Time (4)
This course will provide current and future teachers with the science content knowledge they will need to teach science as presented in the Next Generation Science Standards (NGSS) at the elementary level. The course will be conducted through an integrated program of short lectures, labs, and student projects. Also offered for undergraduate-level credit as Sci 416 and may be taken only once for credit.

Prerequisite: upper-division standing.

Sci 517 - Understanding the Next Generation Science Standards: Interactions and Systems (4)
This course will provide current and future teachers with the science content knowledge they will need to teach science as presented in the Next Generation Science Standards (NGSS) at the elementary level. The course will be conducted through an integrated program of short lectures, labs, and student projects. Also offered for undergraduate-level credit as Sci 417 and may be taken only once for credit.

Prerequisite: upper-division standing.
The course will be conducted through an integrated program of short lectures, labs, and student projects. Also offered for undergraduate-level credit as Sci 417 and may be taken only once for credit.

Prerequisite: upper-division standing.

Sc 808 - Workshop (1-12)
CSE offers a number of credit-based professional development opportunities for existing science teachers. These courses are taught by CSE faculty and community partners and cover a wide range of environmental and science education topics. Credits earned through these courses do not fulfill graduate program credit requirements.

Sc 810 - Special Topics (1-12)
CSE offers a number of credit-based professional development opportunities for existing science teachers. These courses are taught by CSE faculty and community partners and cover a wide range of environmental and science education topics. Credits earned through these courses do not fulfill graduate program credit requirements.

Sc 601 - Research (1-9)
(Credit to be arranged.)

Sc 602 - Independent Study (1-9)
(Credit to be arranged.)

Sc 603 - Thesis (1 - 9)
(Credit to be arranged.)

Sc 604 - Cooperative Education/Internship (1-9)
(Credit to be arranged.)

Sc 605 - Reading and Conference (1-9)
(Credit to be arranged.)

Sc 606 - Special Problems/Projects (1-9)
(Credit to be arranged.)

Sc 607 - Seminar (1-9)
(Credit to be arranged.)

Sc 608 - Workshop (1-9)
(Credit to be arranged.)

Sc 609 - Practicum (1-9)
(Credit to be arranged.)

Sc 610 - Selected Topics (1-9)
(Credit to be arranged.)

Soc - Sociology

Soc 199 - Special Studies (0-9)
Recommended prerequisite: consent of instructor. Maximum: 8 credits.

Soc 200 - Introduction to Sociology (4)
Sociological concepts and perspectives concerning human groups; includes attention to socialization, culture, institutions, stratification, and societies. Consideration of fundamental concepts and research methodology.

Soc 250 - Introduction to Sociology for the Health Sciences (4)
Provides a comprehensive overview of sociological concepts that are important to the health sciences.

Soc 299 - Special Studies (1-8)
(Credit to be arranged.)

Soc 300 - Foundations of Sociology I (4)

Soc 301 - Foundations of Sociology II (4)

Soc 302 - Foundations of Sociology III (4)
Developments in American sociological theory from mid-twentieth century to today. Considers impact of social change and social movements on theory, including neo-Marxism, feminism, post-modernism and current new directions.

Soc 310 - U.S. Society (4)
Examination of the social structure, culture, and demography of the United States. Sociological approaches to such institutions as the economy, religion, education, and the family are explored. Attention given to comparison with other industrialized countries as well as to selected social issues and controversies. Recommended prerequisites: Soc 200, 301, 302.

Soc 314 - Alcohol and Other Drugs (4)
Sociological analysis of the behavior and belief patterns relative to alcohol and other drugs in American society. Prevention and intervention strategies are briefly reviewed.

Soc 314U - Alcohol and Other Drugs (4)
Sociological analysis of the behavior and belief patterns relative to alcohol and other drugs in American society. Prevention and intervention strategies are briefly reviewed.

Soc 320 - Globalization (4)
Exploration of issues and approaches in sociological thinking relative to world systems. World systems are treated not only as world orders made up of political and economic exchanges, but also as cultural orders and institutionalized structures transcending national geographic boundaries. Attention given to the international, national, regional, and local ways that people attempt to deal with the instabilities accompanying globalization. Recommended prerequisites: Soc 200, 301, 302.

Soc 330 - Sociology of Food Inequalities (4)
Examination of food and nutrition issues and problems through the lens of the social sciences, with an emphasis on inequalities in the production, distribution and consumption of food. Economic, social, political and symbolic dimensions of food systems and food behaviors. Social determinants of hunger, malnutrition, and obesity. Exploration of solutions at the local, societal and global level.

Soc 337 - Minorities (4)
Description and analysis of problems involving specific minorities, with major emphasis on American society. Although racial and ethnic groups are usually emphasized, the term "minorities" is broadly defined to include such subordinate-status groups as women, the aged, and religious and cultural minorities.

Soc 337U - Minorities (4)
Description and analysis of problems involving specific minorities, with major emphasis on American society. Although racial and ethnic groups are usually emphasized, the term "minorities" is broadly defined to include such subordinate-status groups as women, the aged, and religious and cultural minorities.
defined to include such subordinate-status groups as women, the aged, and religious and cultural minorities.

**Soc 339 - Marriage and Intimacy (4)**
The sociological and social psychological dimensions of courtship, marriage, and the family. Perspectives on the effects of social environment and transitions in the structure and functions of intimacy, courtship, marriage, and the family. The influence of society and community upon intimate relationships.

**Soc 339U - Marriage and Intimacy (4)**
The sociological and social psychological dimensions of courtship, marriage, and the family. Perspectives on the effects of social environment and transitions in the structure and functions of intimacy, courtship, marriage, and the family. The influence of society and community upon intimate relationships.

**Soc 341 - Population Trends and Policy (4)**
Introduction to the general field of population analysis; a review of the development of population theories, techniques of measurement and analysis of the basic demographic variables, their interrelationships, and population changes.

**Soc 341U - Population Trends and Policy (4)**
Introduction to the general field of population analysis; a review of the development of population theories, techniques of measurement and analysis of the basic demographic variables, their interrelationships, and population changes. Recommended prerequisites: Soc 200.

**Soc 342 - Social Psychology: Self, Attitudes and Social Influence (4)**
Examination of psychological and sociological processes associated with people’s thoughts about and interactions with one another. Particular emphases on self, social identity, social cognition, attitudes, prejudice and persuasion. Expected preparation: Soc 200, or Psy 200 or 204. Credit will not be given for both Soc 342 and Psy 342.

**Soc 343 - Social Psychology: Social Relationships and Groups (4)**
Examination of sociological and psychological processes associated with interpersonal, group, and inter-group behavior. Particular emphases on aggression, pro-social behavior, interpersonal attraction, group influence, conflict and cooperation. Expected preparation: Soc 200, or Psy 200 or 204. Credit will not be given for both Soc 343 and Psy 343.

**Soc 344 - Gender and Sexualities (4)**
Examines the ways in which social constructions of gender both influence and are influenced by the cultural organization of and individual expressions of sexuality. The course explores the intersections among sexuality, culture, gender, and the body and examines a variety of sexualities and emphasizes the multifaceted nature of power, privilege, and oppression.

**Soc 344U - Gender and Sexualities (4)**
Examines the ways in which social constructions of gender both influence and are influenced by the cultural organization of and individual expressions of sexuality. The course explores the intersections among sexuality, culture, gender, and the body and examines a variety of sexualities and emphasizes the multifaceted nature of power, privilege, and oppression.

**Soc 350 - Coming of Age: Adulthood in the US, Europe, and Asia (4)**
An examination of changes in life-course in the US, Scandinavia, Southern Europe, and Japan focusing on the impact of globalization, gender, race and class on key life-transitions (leaving home, education, work, partnering, and having children).

**Soc 350U - Coming of Age: Adulthood in the US, Europe, and Asia (4)**
An examination of changes in life-course in the US, Scandinavia, Southern Europe, and Japan focusing on the impact of globalization, gender, race and class on key life-transitions (leaving home, education, work, partnering, and having children).

**Soc 357 - Sociology of Deviancy (4)**
Introduction and analysis of deviant behavior. Delineation of the sociological and social psychological factors which give rise to deviant roles. Recommended prerequisites: Soc 200.

**Soc 376 - Social Change (4)**
Deals with the technological and ideological factors which govern the evolution and transformation of society, with special emphasis on the operation of such factors since 1800. Recommended prerequisites: Soc 200.

**Soc 380 - Sports in Society (4)**
An objective examination of sports in America as social phenomena. Study of various socio-cultural structures, patterns, and organizations or groups involved with sports. Issues such as race, gender, and class within the context of sports will be explored through a critical sociological lens.

**Soc 397 - Social Research Methods (5)**
Study of the structuring of sociological inquiry, conceptualization and measurement, operationalization, computers in social research, analysis of bivariate and multivariate relations, the logic of sampling and inference. Course includes lecture (4 hours per week) and an introductory research laboratory (2 hours per week). Prerequisite: Stat 243. Expected preparation: Soc 200, 301, 302.

**Soc 397L - Social Research Methods Lab (0)**

**Soc 398 - Sociology Research Project (4)**
Development and execution of a research project integrating some aspect of sociological theory with social science research methodology. Students work in teams to identify a research problem, design and conduct research bearing on this problem, and write a research report. Soc 397 and 398 are to be taken as a two-term sequence.

**Soc 399 - Special Studies (1-6)**
(Credit to be arranged.)

**Soc 399U - Special Studies (4)**
(Credit to be arranged.)

**Soc 401 - Research (1-6)**
(Credit to be arranged.) Consent of instructor.

**Soc 404 - Cooperative Education/Internship (1-12)**
(Credit to be arranged.)
Soc 405 - Reading and Conference (1-6)
(Credit to be arranged.) Consent of instructor.

Soc 407 - Seminar (1-6)
(Credit to be arranged.) Consent of instructor.

Soc 410 - Selected Topics (1-9)
(Credit to be arranged.) Maximum: 12 credits. Consent of instructor.

Soc 418 - Criminology and Delinquency (4)
Social and legal meaning of crime and delinquency explored. Historical and contemporary theories of causes of law breaking reviewed. Social and cultural factors promoting and inhibiting law breaking by juveniles and adults are examined. Attention given to strategies of prevention and control. Also offered for graduate-level credit as Soc 518 and may be taken only once for credit. Recommended prerequisite: Soc 200.

Soc 419 - Sociology of Mental Illness (4)
An overview of sociological perspectives on mental health and illness. Inform the social and historical explanations of mental illness and its consequences. The roles of families, communities, and society in shaping mental illness and its treatment are explored. Also offered for graduate-level credit as Soc 519 and may be taken only once for credit. Recommended prerequisite: Soc 200.

Soc 420 - Urbanization and Community (4)
Analytical approach to the meaning of community in the modern world. The determinants, social consequences of, and responses to the processes of urbanization are considered. Theories of the city emphasizing ecological, sociocultural, and critical explanations for growth and change in urban regions are examined. Patterns of social and structural organization of the metropolis and the cognitive and behavioral aspects of urban life are explored. Also offered for graduate-level credit as Soc 520 and may be taken only once for credit. Recommended prerequisite: Soc 200.

Soc 423 - Stratification (4)
Survey and analysis of stratification theories and empirical research. Analysis of class, race, ethnicity, gender, and sexual orientation, considering economic, social, political, and cultural dimensions of power. Also offered for graduate-level credit as Soc 523 and may be taken only once for credit. Recommended prerequisite: Soc 200.

Soc 424 - Groups, Interaction and Identity (4)
Analysis of the formation and functioning of intergroup and intragroup relations. Attention to group organization and interaction, performance, cooperation, conflict, and group membership and individual identity. Also offered for graduate-level credit as Soc 524 and may be taken only once for credit. Expected preparation: Soc or Psy 342.
Prerequisite: Soc 200.

Soc 425 - Sociology of Gender (4)
Consideration of the theoretical, methodological, and empirical contributions of current sociological scholarship on gender. Emphasis on the intersection of gender, sexuality, race/ethnicity, and class. Analysis of topics such as: masculinity/femininity, parenting, family, education, work, sexualities, reproduction, politics, and social change. This is the same course as WS 425 and may be taken only once for credit. Also offered for graduate-level credit as Soc 525 and may be taken only once for credit.
Prerequisite: junior standing. Crosslisted as: WS 425.

Soc 426 - Gender & Mental Health (4)
Social and historical explanations of, and research on, mental illness and mental health, with a focus on gender. Contemporary distributions, diagnoses, and treatments of mental illness among men and women are examined. Focus on psychiatric disorder and gender-based discourse. Also offered for graduate-level credit as Soc 526; this is the same course as WS 426 and may be taken only once for credit.
Prerequisite: Upper-division standing.

Soc 427 - Gender and Work (4)
Consideration of the theoretical, methodological, and empirical contributions of current scholarship in the area of gender and work. Emphasis on the intersection of gender, sexuality, race/ethnicity, and class. Topics include: inequalities in the labor force, low wage work and poverty, work/family conflict, sex/sexuality in the workplace, and masculinity. Also offered for graduate-level credit as Soc 527 and may be taken only once for credit.

Soc 430 - Hate Crimes (4)
Hate crimes as a social issue. Central themes: the role that gender plays in the commission and awareness of hate crimes and the mainstreaming of bias crimes and the ideology behind them. Includes analysis of propaganda and coded language in the popular media and the Internet, analysis of the grass-roots response in the popular media, and evaluation of their effectiveness. Also offered for graduate-level credit as Soc 530 and may be taken only once for credit.
Prerequisite: Soc 200.

Soc 436 - Social Movements (4)
Formation, dynamics, and outcomes of social movements. Examination of the effects of circumstances, strategies, and alliances on the outcomes of social movements, including their impact on politics and society.

Soc 436U - Social Movements (4)
Formation, dynamics, and outcomes of social movements. Examination of the effects of circumstances, strategies, and alliances on the outcomes of social movements, including their impact on politics and society. Recommended prerequisite: Soc 200.

Soc 441 - Population and Society (4)
Survey and analysis of population dynamics (births, deaths, migration) and society. Examination of demographic concepts, theories, data and measurements, and research. Role of population processes on social life and public policies are highlighted, including population aging, economic development and the environment, urbanization, health and health care, race and ethnicity, and government/social/business planning. This course is the same as USP 419/519; course may be taken only once for credit. Also offered for graduate-level credit as Soc 541 and may be taken only once for credit.
Prerequisite: Soc 200. Crosslisted as: USP 419.

Soc 444 - Race, Ethnicity, and Nationality (4)
Analysis of the emergence, persistence and meaning of definitions of racial, ethnic and national statuses in selected areas of the modern world. Consideration of the consequences of changing definitions for intergroup and global relations. Also offered for graduate-level credit as Soc 544 and may be taken only once for credit. Recommended prerequisite: Soc 200.

Soc 446 - Immigrants in America (4)
Exploration of controversial issues around immigration to the U.S. Students will read and discuss social science research on demographics of immigrants, immigration policy, immigrant incorporation, and the impact of immigration on the receiving society.
Prerequisite: Soc 200 or Soc 337.

Soc 448 - Sociology of Education (4)
Development of a sociological understanding of education in the United States. Examination the role of schooling in regards to the larger society, the social structure of schools, processes of social mobility, stratification and social reproduction; the dynamics of race, class, and gender inequalities in education, student teacher relationship; school choice; and the outcomes of education. Also offered for graduate-level credit as Soc 548 and may be taken only once for credit.

Soc 450 - Sociology of Higher Education (4)
Social factors affecting individuals within higher education. Particular attention to inequalities within higher education and the role higher education plays in promoting social mobility as well as social reproduction. Includes models of higher education, the application of sociological theories to issues in higher education, access to college, Affirmative Action, standardized testing, and class, race, and gender-based differences in individual educational outcomes and retention. Also offered for graduate-level credit as Soc 550 and may be taken only once for credit.
Prerequisite: sophomore standing or higher; Soc 200.

Soc 452 - Education and Equality: Comparing the US, Asia, Europe (4)
Despite the promise of equal opportunity, US public schools produce vast inequalities in educational outcomes compared to other nations. Why? The course examines the impacts of tracking, testing, teaching styles, race, class, and gender in the US through comparisons of Japan, Singapore, Germany, and Finland. Also offered for graduate-level credit as Soc 552 and may be taken only once for credit.
Prerequisite: Soc 200, Soc 310, or Soc 320.

Soc 454 - Sociology through Film (4)
Filmmakers, like sociological fieldworkers, use stories to trace the action of their subjects or characters and scenes to reconstruct their shared social worlds. Through sociological studies and documentary and narrative films, the course examines portrayals of social institutions and processes which may include education, ethnic relations, artistic production, and other fields. Also offered for graduate-level credit as Soc 554 and may be taken only once for credit.
Prerequisite: Soc 200, Soc 310, or Soc 320.

Soc 457 - Complex Organizations (4)
Examination of complex organizations both as formal structures and as cultural systems. Analysis of the relations between organizations and individuals of inter-organizational dynamics and of the rationalization of modern societies. Also offered for graduate-level credit as Soc 557 and may be taken only once for credit. Recommended prerequisite: Soc 200.

Soc 459 - Sociology of Health and Medicine (4)
The application of sociology to the field of health and medicine. Attention given to a consideration of the broader questions of health in modern society, including the role of the medical practitioner in modern society, social factors and disease and responses to illness. The social organization of medicine is examined within the context of the larger medical care system. Recommended prerequisite: Soc 200.

Soc 460 - Youth Subcultures (4)
Youth as crisis and in crisis. Focus on methodology, ethnomethodology, and field experience; students will create ethnographs. Examination of the science of semiotics to understand subcultural style as language. Expected preparation: Soc 397. Also offered for graduate-level credit as Soc 560 and may be taken only once for credit. Prerequisite: Soc 200.

Soc 461 - Sociology of the Family (4)
Sociological analysis of the structure and functions of the family institution and its relationship to external systems such as the economy and polity. Changing and diverse forms of family organization in urban society. Analysis of role relations in the family. Also offered for graduate-level credit as Soc 561 and may be taken only once for credit. Recommended prerequisite: Soc 200.

Soc 462 - Sociology of Integrative Medicine (4)
An examination of common systems and practices understood as complementary and alternative medicine (CAM) including prevalence, patterns of use, trends, consumer health beliefs and motivations, and integration with mainstream allopathic medicine; philosophical, historical and political dimensions; theories of health and illness; evidence-based research vs. traditional and folk beliefs; and a consideration of benefits and limitations considering the growing popularity. Not a course about how to practice any form of alternative medicine. Also offered for graduate-level credit as Soc 562 and may be taken only once for credit. Recommended: Soc 200.

Soc 463 - Global Inequalities and Health (4)
An examination of international health inequalities from social, political and economic perspectives. The impact of globalization, transnationalism and migration on population health. Inequalities within and between countries and regions, and the social dynamics that shape those inequalities. Infectious pandemics and chronic diseases, and global efforts to control diseases and improve health. Recommended prerequisites: Soc 200.
Soc 465 - Environmental Sociology (4)
Survey and analysis of the types of social forces which frame the nature of environmental problems concerning natural resource use and distribution as they emerge in public consciousness within the United States and globally. Examination of the social forces which lead to the consideration and implementation of mechanisms to solve these issues once they have emerged.

Soc 466 - Political Sociology (4)
Analysis of consensus and dissensus in community and society. Examination of public opinion, authority, influence, and the processes by which elites are formed and acquire legitimacy and popular support. Social bases of democracy and totalitarianism. Recommended prerequisite: Soc 200.

Soc 469 - Sociology of Aging (4)
A study of social determinants of the human life course, including biological and demographic conditions, age status patterns, age grading, rites of passage, socialization, generational phenomena, and youth and old age movements. Also offered for graduate-level credit as Soc 669 and may be taken only once for credit. Recommended prerequisite: Soc 200.

Soc 472 - Contemporary Sociological Theory (4)
Study of various frames of reference in contemporary sociological theory. Specific topics vary with instructor. Recommended prerequisites: Soc 200, 301, 302; senior standing.

Soc 480 - Sociology of Religion (4)
Analysis of the nature of the sacred; attitudes toward the sacred in contrast to the secular. Comparison of the social organization of sect and church in their relation to the larger society. Survey of recent empirical studies of religiosity and religious practices in America. New trends in American religion. Also offered for graduate-level credit as Soc 580 and may be taken only once for credit. Recommended prerequisite: Soc 200.

Soc 483 - Sociology of the Middle East (4)
This course will examine the sociological development of the modern Middle East. It will especially focus on causes and consequences of rapid social change, including revolutions, coups, and insurgent movements. It will examine the role of Islam and tribalism in these movements. Also offered for graduate-level credit as Soc 583 and may be taken only once for credit. Recommended prerequisite: Soc 200.

Soc 497 - Applied Survey Research (4)
Provides theoretical framework for and experience in design, execution, and interpretation of social surveys including sampling procedures, questionnaire design, interviewing techniques, coding and computer analysis, and report writing. Also offered for graduate-level credit as Soc 597 and may be taken only once for credit. Recommended prerequisites: Stat 243 and Soc 397, 398 or equivalent.

Soc 501 - Research (1-9)
(Credit to be arranged.) Consent of instructor.

Soc 503 - Thesis (1-9)
(Credit to be arranged.) Pass/no pass option.

Soc 504 - Cooperative Education/Internship (1-9)
(Credit to be arranged.) Consent of instructor.

Soc 505 - Reading and Conference (1-6)
(Credit to be arranged.) Consent of instructor.

Soc 507 - Seminar (1-6)
(Credit to be arranged.) Consent of instructor.

Soc 509 - Practicum (1-9)
(Credit to be arranged.) Maximum: 12 credits. Consent of instructor.

Soc 510 - Selected Topics (1-9)
(Credit to be arranged.) Maximum: 12 credits. Consent of instructor.

Soc 513 - Thesis Workshop (1)
Workshop for all sociology graduate students who are currently enrolled in Soc 503 for four credits or more. Discussion and review of students' progress and problems. Recommended prerequisite: graduate status in sociology. Corequisite: Soc 503. Pass/no pass only.

Soc 518 - Criminology and Delinquency (4)
Social and legal meaning of crime and delinquency explored. Historical and contemporary theories of causes of law breaking reviewed. Social and cultural factors promoting and inhibiting law breaking by juveniles and adults are examined. Attention given to strategies of prevention and control. Also offered for undergraduate-level credit as Soc 418 and may be taken only once for credit. Recommended prerequisites: Soc 200.

Soc 519 - Sociology of Mental Illness (4)
An overview of sociological perspectives on mental health and illness. Informs understanding of mental health and illness by challenging dominant views of mental illness, examining how social relationships play a role in mental illness, questioning the goals and implications of mental health policy and presenting research on how mental health services are organized and provided. Also offered for undergraduate-level credit as Soc 419 and may be taken only once for credit. Prerequisite: Soc 200.

Soc 520 - Urbanization and Community (4)
Analytical approach to the meaning of community in the modern world. The determinants, social consequences of, and responses to the processes of urbanization are considered. Theories of the city emphasizing ecological, sociocultural, and critical explanations for growth and change in urban regions are examined. Patterns of social and structural organization of the metropolis and the cognitive and behavioral aspects of urban life are explored. Also offered for undergraduate-level credit as Soc 420 and may be taken only once for credit. Recommended prerequisite: Soc 200.

Soc 523 - Stratification (4)
Survey and analysis of stratification theories and empirical research. Analysis of class, race, ethnicity, gender, and sexual orientation, considering economic, social, political, and cultural dimensions of power. Also offered for undergraduate-level credit as Soc 423 and may be taken only once for credit. Recommended prerequisite: Soc 200.
Soc 524 - Groups, Interaction and Identity (4)

Analysis of the formation and functioning of intergroup and intragroup relations. Attention to group organization and interaction, performance, cooperation, conflict, and group membership and individual identity. Analysis of the formation and functioning of intergroup and intragroup relations. Attention to group organization and interaction, performance, cooperation, conflict, and group membership and individual identity. Also offered for undergraduate-level credit as Soc 424 and may be taken only once for credit. Expected preparation: Soc or Psy 342.

Prerequisite: Soc 200.

Soc 525 - Sociology of Gender (4)

Consideration of the theoretical, methodological, and empirical contributions of current sociological scholarship on gender. Emphasis on the intersection of gender, sexuality, race/ethnicity, and class. Analysis of topics such as: masculinity/femininity, parenting, family, education, work, sexualities, reproduction, politics, and social change. This is the same course as WS 525 and may be taken only once for credit. Also offered for undergraduate-level credit as Soc 425 and may be taken only once for credit.

Prerequisite: junior standing. Crosslisted as: WS 525.

Soc 526 - Gender & Mental Health (4)

Social and historical explanations of, and research on, mental illness and mental health, with a focus on gender. Contemporary distributions, diagnoses, and treatments of mental illness among men and women are examined. Focus on psychiatric disorder and gender-based discourse. Also offered for undergraduate-level credit as Soc 426; this is the same course as WS 426 and may be taken only once for credit.

Soc 527 - Gender and Work (4)

Consideration of the theoretical, methodological, and empirical contributions of current scholarship in the area of gender and work. Emphasis on the intersection of gender, sexuality, race/ethnicity, and class. Topics include: inequalities in the labor force, low wage work and poverty, work/family conflict, sex/sexuality in the workplace, and masculinity. Also offered for undergraduate-level credit as Soc 427 and may be taken only once for credit.

Soc 528 - Gender Inequality (4)

Explore sociological scholarship on topics related to gender inequality. Emphasis on examining the intersection of gender with race, ethnicity, class, and sexuality. Major focus will be evaluating the theoretical, methodological, and empirical contributions of scholarship in the area of gender inequality. Also offered as Soc 628 and may be taken only once for credit.

Soc 530 - Hate Crimes (4)

Hate crimes as a social issue. Central themes: the role that gender plays in the commission and awareness of hate crimes and the mainstreaming of bias crimes and the ideology behind them. Includes analysis of propaganda and coded language in the popular media and the Internet, analysis of the grass-roots response in the popular media, and evaluation of their effectiveness. Also offered for undergraduate-level credit as Soc 430 and may be taken only once for credit.

Prerequisite: Soc 200.

Soc 537 - Qualitative Data Analysis (4)

Introduction to three techniques for analyzing qualitative data: software-based analysis using ATLAS.ti, Grounded Theory, and Thematic Analysis. Practical orientation, emphasizing hands-on experience with these techniques. Most useful for students engaged in data collection. Also offered as Soc 637 and may be taken only once for credit.

Soc 538 - Integrating Qualitative and Quantitative Methods (4)

Research designs for combining qualitative and quantitative methods that have reasonably well-understood benefits, and can be implemented in a relatively straightforward fashion. The value of pragmatism as a philosophical paradigm for doing mixed methods research will also be considered. Also offered as Soc 638 and may be taken only once for credit.

Soc 539 - Focus Groups Interviewing (4)

A practically oriented course which teaches the methods of conducting research using focus groups. Course will follow the steps involved in conducting a research project that uses focus groups. Related methods, dyadic interviewing, and hands on training are at the center of this course. Also offered as Soc 639 and may be taken only once for credit.

Soc 541 - Population and Society (4)

Survey and analysis of population dynamics (births, deaths, migration) and society. Examination of demographic concepts, theories, data and measurements, and research. Role of population processes on social life and public policies are highlighted, including population aging, economic development and the environment, urbanization, health and health care, race and ethnicity, and government/social/business planning. This course is the same as USP 419/519; course may be taken only once for credit. Also offered for undergraduate-level credit as Soc 441 and may be taken only once for credit.

Prerequisite: Soc 200. Crosslisted as: USP 519.

Soc 544 - Race, Ethnicity, and Nationality (4)

Analysis of the emergence, persistence and meaning of definitions of racial, ethnic and national statuses in selected areas of the modern world. Consideration of the consequences of changing definitions for intergroup and global relations. Also offered for undergraduate-level credit as Soc 444 and may be taken only once for credit. Recommended prerequisite: Soc 200.

Soc 548 - Sociology of Education (4)

Development of a sociological understanding of education in the United States. Examination the role of schooling in regards to the larger society, the social structure of schools, processes of social mobility, stratification and social reproduction; the dynamics of race, class, and gender inequalities in education, student teacher relationship; school choice; and the outcomes of education. Also offered for undergraduate-level credit as Soc 448 and may be taken only once for credit.


Soc 550 - Sociology of Higher Education (4)

Social factors affecting individuals within higher education. Particular attention to inequalities within higher education and the
role higher education plays in promoting social mobility as well as social reproduction. Includes models of higher education, the application of sociological theories to issues in higher education, access to college, Affirmative Action, standardized testing, and class, race, and gender-based differences in individual educational outcomes and retention. Also offered for undergraduate-level credit as Soc 450 and may be taken only once for credit.

Prerequisite: sophomore standing or higher; Soc 200.

Soc 552 - Education and Equality: Comparing the US, Asia, Europe (4)

Despite the promise of equal opportunity, US public schools produce vast inequalities in educational outcomes compared to other nations. Why? The course examines the impacts of tracking, testing, teaching styles, race, class, and gender in the US through comparisons of Japan, Singapore, Germany, and Finland. Also offered for undergraduate-level credit as Soc 452 and may be taken only once for credit.

Prerequisite: Soc 200, Soc 310, or Soc 320.

Soc 554 - Sociology through Film (4)

Filmmakers, like sociological fieldworkers, use stories to trace the action of their subjects or characters and scenes to reconstruct their shared social worlds. Through sociological studies and documentary and narrative films, the course examines portrayals of social institutions and processes which may include education, ethnic relations, artistic production, and other fields. Also offered for undergraduate-level credit as Soc 454 and may be taken only once for credit.

Prerequisite: Soc 200, Soc 310, or Soc 320.

Soc 557 - Complex Organizations (4)

Examination of complex organizations both as formal structures and as cultural systems. Analysis of the relations between organizations and individuals of inter-organizational dynamics and of the rationalization of modern societies. Also offered for undergraduate-level credit as Soc 457 and may be taken only once for credit.

Recommended prerequisite: Soc 200.

Soc 560 - Youth Subcultures (4)

Youth as crisis and in crisis. Focus on methodology, ethnomethodology, and field experience; students will create ethnographs. Examination of the science of semiotics to understand subcultural style as language. Expected preparation: Soc 397. Also offered for undergraduate-level credit as Soc 460 and may be taken only once for credit.

Prerequisite: Soc 200.

Soc 561 - Sociology of the Family (4)

Sociological analysis of the structure and functions of the family institution and its relationship to external systems such as the economy and polity. Changing and diverse forms of family organization in urban society. Analysis of role relations in the family. Also offered for undergraduate-level credit as Soc 461 and may be taken only once for credit. Recommended prerequisite: Soc 200.

Soc 562 - Sociology of Integrative Medicine (4)

An examination of common systems and practices understood as complementary and alternative medicine (CAM) including prevalence, patterns of use, trends, consumer health beliefs and motivations, and integration with mainstream allopathic medicine; philosophical, historical and political dimensions; theories of health and illness; evidence-based research vs. traditional and folk beliefs; and a consideration of benefits and limitations considering the growing popularity. Not a course about how to practice any form of alternative medicine. Also offered for undergraduate-level credit as Soc 462 and may be taken only once for credit. Recommended: Soc 200.

Soc 563 - Environmental Sociology (4)

Analysis of the types of social forces which frame the nature of environmental problems concerning resource use and distribution across spatial and geopolitical levels. Examines the social forces which influence which problems are tackled; the mechanisms selected to solve the problems; and the social impact of the selected solutions. Also offered as Soc 665 and may be taken only once for credit. Expected preparation: undergraduate exposure to basic social science concepts.

Soc 569 - Sociology of Aging (4)

A study of social determinants of the human life course, including biological and demographic conditions, age status patterns, age grading, rites of passage, socialization, generational phenomena, and youth and old age movements. Also offered for undergraduate-level credit as Soc 469 and may be taken only once for credit. Recommended prerequisite: Soc 200.

Soc 572 - Contemporary Sociological Theory (4)

Study of various frames of reference in contemporary sociological theory. Specific topics vary with instructor. Recommended prerequisites: Soc 200, 301, 302; senior standing.

Soc 576 - Theories of Social Change (3)

A critical examination of the major theories of social change. Analysis of the components of change; cause, agents, targets, channels, and strategies. Consideration of the relationship between change and power, influence, planning and control, modernization, development, and world systems approaches. Recommended prerequisite: graduate status.

Soc 577 - Topics in Contemporary Theory (4)

Exploration of theoretical approaches and issues of emerging interest in sociology, such as conceptualization of social systems, conflict, the problems of relativity, and ideology. Specific topics vary with instructor. Recommended prerequisite: Soc 301, 302 and graduate status.

Soc 580 - Sociology of Religion (4)

Analysis of the nature of the sacred; attitudes toward the sacred in contrast to the secular. Comparison of the social organization of sect and church in their relation to the larger society. Survey of recent empirical studies of religiosity and religious practices in America. New trends in American religion. Also offered for undergraduate-level credit as Soc 480 and may be taken only once for credit. Recommended prerequisite: Soc 200.

Soc 583 - Sociology of the Middle East (4)

This course will examine the sociological development of the modern Middle East. It will especially focus on causes and consequences of rapid social change,
including revolutions, coups, and insurgent movements. It will examine the role of Islam and tribalism in these movements. Also offered for undergraduate-level credit as Soc 483 and may be taken only once for credit. Recommended prerequisite: Soc 200.

**Soc 584 - Social Inequality (4)**

Theoretical perspectives and current research in social inequality including dimensions such as social class, race/ethnicity, gender, age, and nativity. Exploration of social inequality in selected domains, such as health services and outcomes, employment and work, educational attainment, housing, and other areas of sociological inquiry. Also offered as Soc 684 and may be taken only once for credit.

**Soc 585 - Medical Sociology (4)**

Seminar in medical sociology. Topics include how social stratification affects health outcomes, environmental hazards, social construction of medical knowledge, health care occupations, U.S. health policy, privatization of medical industries, and comparative health care systems. Also offered as Soc 685 and may be taken only once for credit. Recommended prerequisite: Soc 459/559 or consent of instructor.

**Soc 586 - Topics in Health and Inequality (4)**

Seminar focusing on the impact of race, class, and/or gender on health and health care. Topics may include medicalization of women's bodies, the social consequences of disparities, and current public policy debates about reducing disparities. Also offered as Soc 686 and may be taken only once for credit. Recommended prerequisite: Soc 459/559.

**Soc 587 - International Health Inequalities (4)**

Explores the sociology of health and inequality in an international context. Topics include international health institutions, healthcare systems, and the social determinants of health inequalities in a global perspective. Also offered as Soc 687 and may be taken only once for credit.

**Soc 588 - Social Sustainability Theory and Practice (4)**

Healthy families; healthy communities; healthy democracies; economic, gender and racial equity; and social justice are all factors of social sustainability. This course will examine how to measure and how to reach these goals, by examining models locally, nationally and internationally. We will look at best practices of city, state and national governments, businesses, unions, and NGOs. We will also examine the relationship between economic, environmental and social sustainability. Also offered as Soc 688 and may be taken only once for credit.

**Soc 590 - Social Research Strategies (4)**

Consideration of the nature of sociological knowledge; elements of social research design; methods of observation and data collection; reliability and validity of information; techniques of data analysis. Recommended prerequisite: graduate status.

**Soc 591 - Theoretical Perspectives in Sociology (4)**

Analysis of the major contemporary theories in sociology. Attention to the problems of order and change, and power and inequality, as well as to the micro/macro problem in sociological theory. Recommended prerequisite: Soc 470 and graduate status.

**Soc 592 - Qualitative Methods (4)**

Strategies for acquisition and analysis of data using such approaches as participant observation, content analysis, field and case studies. Attention to the special problems of validity and reliability in such research. Consideration of ethical issues and researcher responsibility in qualitative research. Recommended prerequisite: graduate status.

**Soc 593 - Quantitative Methods (4)**

The application of quantitative methodology to sociological problems. Topics include: science and logical empiricism; measurement of association; procedures of statistical inference; multivariate and log linear analysis; computer application for social research. Recommended prerequisites: Stat 243, Soc 397, 398, graduate status.

**Soc 594 - Theory Construction and Research (4)**

Examination of the craft of sociological research in conjunction with thesis work. The role of theory in research, evaluating published work, biases in data sources and the process of thesis writing. Recommended prerequisites: Soc 590, 591; graduate status.

**Soc 595 - Research Practicum (4)**

Overview of the process of linking sociological data and ideas to broader communities of interest. Exercises in preparation of research grants and experience in working in a team research environment. Recommended prerequisites: Soc 590, 591; graduate status.

**Soc 597 - Applied Survey Research (4)**

Provides theoretical framework for and experience in design, execution, and interpretation of social surveys including sampling procedures, questionnaire design, interviewing techniques, coding and computer analysis, and report writing. Also offered for undergraduate-level credit as Soc 497 and may be taken only once for credit. Recommended prerequisites: Stat 243 and Soc 397, 398 or equivalent.

**Soc 598 - Globalization Seminar (4)**

Analysis of the ways in which economic patterns that reach across national boundaries affect the security of communities and their standards of living. Topics include how different economic classes fare in the rapid reshuffling of national economies that globalization entails; the role of international institutions in shaping economic globalization; the experience and responses of workers as a group; and the role of states in facilitating or resisting the adverse impacts of globalization. Also offered as Soc 698 and may be taken only once for credit.

**Soc 601 - Research (0-9)**

(Credit to be arranged.)

**Soc 603 - Dissertation (1-9)**

(Credit to be arranged.)

**Soc 604 - Cooperative Education/Internship (1-9)**

(Credit to be arranged.)

**Soc 605 - Reading and Conference (1-6)**

(Credit to be arranged.)

**Soc 607 - Seminar (1-6)**

(Credit to be arranged.)

**Soc 610 - Selected Topics (1-9)**

(Credit to be arranged.)
Soc 628 - Gender Inequality (4)
Explore sociological scholarship on topics related to gender inequality. Emphasis on examining the intersection of gender with race, ethnicity, class, and sexuality. Major focus will be evaluating the theoretical, methodological, and empirical contributions of scholarship in the area of gender inequality. Also offered as Soc 528 and may be taken only once for credit.

Soc 637 - Qualitative Data Analysis (4)
Introduction to three techniques for analyzing qualitative data: software-based analysis using ATLAS.ti, Grounded Theory, and Thematic Analysis. Practical orientation, emphasizing hands-on experience with these techniques. Most useful for students engaged in data collection. Also offered as Soc 537 and may be taken only once for credit.

Soc 638 - Integrating Qualitative and Quantitative Methods (4)
Research designs for combining qualitative and quantitative methods that have reasonably well-understood benefits, and can be implemented in a relatively straightforward fashion. The value of pragmatism as a philosophical paradigm for doing mixed methods research will also be considered. Also offered as Soc 538 and may be taken only once for credit.

Soc 639 - Focus Groups Interviewing (4)
A practically oriented course which teaches the methods of conducting research using focus groups. Course will follow the steps involved in conducting a research project that uses focus groups. Related methods, dyadic interviewing, and hands on training are at the center of this course. Also offered as Soc 539 and may be taken only once for credit.

Soc 665 - Environmental Sociology (4)
Analysis of the types of social forces which frame the nature of environmental problems concerning resource use and distribution across spatial and geopolitical levels. Examines the social forces which influence which problems are tackled; the mechanisms selected to solve the problems; and the social impact of the selected solutions. Also offered as Soc 565 and may be taken only once for credit. Expected preparation: undergraduate exposure to basic social science concepts.

Soc 684 - Social Inequality (4)
Theoretical perspectives and current research in social inequality including dimensions such as social class, race/ethnicity, gender, age, and nativity. Exploration of social inequality in selected domains, such as health services and outcomes, employment and work, educational attainment, housing, and other areas of sociological inquiry. Also offered as Soc 584 and may be taken only once for credit.

Soc 685 - Medical Sociology (4)
Seminar in medical sociology. Topics include how social stratification affects health outcomes, environmental hazards, social construction of medical knowledge, health care occupations, U.S. health policy, privatization of medical industries, and comparative health care systems. Also offered as Soc 585 and may be taken only once for credit. Recommended prerequisite: Soc 459/559 or consent of instructor.

Soc 686 - Topics in Health and Inequality (4)
Seminar focusing on the impact of race, class, and/or gender on health and health care. Topics may include medicalization of women’s bodies, the social consequences of disparities, and current public policy debates about reducing disparities. Also offered as Soc 586 and may be taken only once for credit. Recommended prerequisite: Soc 459/559.

Soc 687 - International Health Inequalities (4)
Explores the sociology of health and inequality in an international context. Topics include international health institutions, healthcare systems, and the social determinants of health inequalities in a global perspective. Also offered as Soc 587 and may be taken only once for credit.

Soc 688 - Social Sustainability Theory and Practice (4)
Healthy families; healthy communities; healthy democracies; economic, gender and racial equity; and social justice are all factors of social sustainability. This course will examine how to measure and how to reach these goals, by examining models locally, nationally and internationally. We will look at best practices of city, state and national governments, businesses, unions, and NGOs. We will also examine the relationship between economic, environmental and social sustainability. Also offered as Soc 588 and may be taken only once for credit.

Soc 692 - Foundations of Ecosystem Services (4)
Learn key ecological, social, economic and philosophical theories that underlie ecosystem services science and management. Examine ecological processes, policy and governance in managing these systems, as well as impacts of changing climate, human demographics, etc. This is the same course as ESR 692 and may be taken only once for credit.

Examination of social forces and institutions that influence use and guide policy for management of ecosystem services. Investigation of inter-jurisdictional governance of natural systems to establish law and policy that promote investment in ecosystems to create sustainable cities.

Soc 695 - Advanced Methods in Sociology (4)
Introduces a range of advanced quantitative methods commonly found in published research in sociology. Particular attention will be paid to the techniques commonly used to address the most common shortcomings of sociological data, including estimation of multivariate models with categorical dependent variables (i.e. logistic regression) and to nonparametric methods for analyzing data.
Prerequisite: Soc 585/685, Soc 593 and Stat 543 or equivalent.

Soc 695L - Advanced Methods in Sociology Lab (0)
Lab for Advanced Methods in Sociology.

Soc 698 - Globalization Seminar (4)
Analysis of the ways in which economic patterns that reach across national boundaries affect the security of communities and their standards of living. Topics include how different economic classes fare in the rapid reshuffling of
national economies that globalization entails; the role of international institutions in shaping economic globalization; the experience and responses of workers as a group; and the role of states in facilitating or resisting the adverse impacts of globalization. Also offered as Soc 598 and may be taken only once for credit.

Span - Spanish

Span 101 - First-year Spanish (4)
An introduction to elementary Spanish. Emphasis on listening comprehension and oral practice, the elements of grammar, vocabulary building, and elementary readings. This is the first course in a sequence of three: Span 101, Span 102, and Span 103.

Span 101M - First-year Spanish Modified (4)
An introduction to elementary Spanish. Emphasis on listening comprehension and oral practice, the elements of grammar, vocabulary building, and elementary readings.

Span 102 - First-year Spanish (4)
An introduction to elementary Spanish. Emphasis on listening comprehension and oral practice, the elements of grammar, vocabulary building, and elementary readings. This is the second course in a sequence of three: Span 101, Span 102, and Span 103.

Span 102M - First-year Spanish Modified (4)
An introduction to elementary Spanish. Emphasis on listening comprehension and oral practice, the elements of grammar, vocabulary building, and elementary readings.

Span 103 - First-year Spanish (4)
An introduction to elementary Spanish. Emphasis on listening comprehension and oral practice, the elements of grammar, vocabulary building, and elementary readings. This is the third course in a sequence of three: Span 101, Span 102, and Span 103.

Span 103M - First-year Spanish Modified (4)
An introduction to elementary Spanish. Emphasis on listening comprehension and oral practice, the elements of grammar, vocabulary building, and elementary readings.

Span 150 - First-year Spanish (Intensive) (6)
A two-term course covering the content of Span 101, 102, 103.

Span 151 - First-year Spanish (Intensive) (6)
A two-term course covering the content of Span 101, 102, 103.

Span 199 - Special Studies (1-12)
(Credit to be arranged.)

Span 201 - Second-year Spanish (4)
Intensive review of basic materials introduced in first-year program and further development of communication skills. This is the first course in a sequence of three: Span 201, 202, and 203. Recommended prerequisite: Span 103.

Span 201H - Second-year Spanish Heritage
Span 202 - Second-year Spanish (4)
Intensive review of basic materials introduced in first-year program and further development of communication skills. This is the second course in a sequence of three: Span 201, 202, and 203. Recommended prerequisite: Span 103.

Span 202H - Second-year Spanish Heritage
Span 203 - Second-year Spanish (4)
Intensive review of basic materials introduced in first-year program and further development of communication skills. This is the third course in a sequence of three: Span 201, 202, and 203. Recommended prerequisite: Span 103.

Span 203H - Second-year Spanish Heritage
Span 299 - Special Studies (1-12)
(Credit to be arranged.)

Span 299H - (1 - 12)

Span 301 - Third-year Spanish (4)
Spanish language study to help develop advanced proficiency. Intensive grammar instruction in preparation for upper division courses in culture, linguistics and literature. Emphasis on speaking, listening comprehension, reading, and writing skills for analysis and research. This is the first course in a sequence of three: Span 301, 302, and 303. It is preferable to take the sequence in order.

Span 301H - Third-year Spanish Heritage
Span 302 - Third-year Spanish (4)
Spanish language study to help develop advanced proficiency. Intensive grammar instruction in preparation for upper division courses in culture, linguistics and literature. Emphasis on speaking, listening comprehension, reading, and writing skills for analysis and research. This is the second course in a sequence of three: Span 301, 302, and 303. It is preferable to take the sequence in order.

Span 302H - Third-year Spanish Heritage
Span 303 - Third-year Spanish (4)
Spanish language study to help develop advanced proficiency. Intensive grammar instruction in preparation for upper division courses in culture, linguistics and literature. Emphasis on speaking, listening comprehension, reading, and writing skills for analysis and research. This is the third course in a sequence of three: Span 301, 302, and 303. It is preferable to take the sequence in order.

Span 303H - Third-year Spanish Heritage
Span 325 - Spanish Phonetics and Phonology (4)
Introduction to the sounds of Spanish: their place and manner of articulation (phonetics) as well as how they pattern with respect to each other and as influenced by morphological and syntactic factors (phonology).
Prerequisite: Eight credits of either Span 301, 302, or Span 303.

Span 330 - Peninsular Culture and Civilization (4)
Historical development of life, thought, and the arts in Spain.
Prerequisite: Eight credits of either Span 301, 302, or Span 303.

Span 331 - Latin American Culture and Civilization (4)
Historical development of life, thought, and the arts in Latin America.
Prerequisite: Eight credits of either Span 301, 302, or Span 303.
Span 341 - Pre-Modern Cultural and Literary Foundations (4)
Study of medieval and/or pre-Colombian cultural texts and practices that form the foundations of Spanish literary traditions. This is the first course in a sequence of four: Span 341, Span 342, Span 343, and Span 344.
Prerequisite: Span 301, Span 302, Span 303.

Span 342 - Early Modern and Colonial Cultural and Literary Expression (4)
Study of Early Modern Spanish and/or Hispanic American literary practices and works from the 15th to the 17th century. This is the second course in a sequence of four: Span 341, Span 342, Span 343, and Span 344.
Prerequisite: Span 301, Span 302, Span 303.

Span 343 - Cultural and Literary Expressions of Independence (4)
Study of Spanish and/or Hispanic American literary practices and works in the context of 18th-, 19th-, and 20th-century independence and republican movements. This is the third course in a sequence of four: Span 341, Span 342, Span 343, and Span 344.
Prerequisite: Span 301, Span 302, Span 303.

Span 344 - Modern Cultural and Literary Expressions (4)
Study of Spanish and/or Hispanic American literary practices and works in the 20th century with emphases on war, dictatorship, revolution and globalization. This is the fourth course in a sequence of four: Span 341, Span 342, Span 343, and Span 344.
Prerequisite: Span 301, Span 302, Span 303.

Span 345 - Present-Day Cultural and Literary Expression (4)
Study of contemporary Spanish and/or Hispanic American literary practices, works, and new media and works in global and digital contexts.
Prerequisite: Span 301, Span 302, and Span 303.

Span 395 - Spanish in the World (4)
The expansion of Spanish through media, Spanish and the other official languages of the Iberian Peninsula, Spanish in the USA, and the language politics of Latin America.

Span 399 - Special Studies (1-6) (Credit to be arranged.)
Span 399U - Special Studies (4) (Credit to be arranged.)
Span 401 - Research (1-6) (Credit to be arranged.)
Span 404 - Cooperative Education/internship (1-12) (Credit to be arranged.)
Span 405 - Reading and Conference (1-6) (Credit to be arranged.)
Span 407 - Seminar (0-6) (Credit to be arranged.)
Span 408 - Workshop (1-6) (Credit to be arranged.)
Span 409 - Practicum (1-12) (Credit to be arranged.)
Span 410 - Selected Topics (1-6) (Credit to be arranged.)
Span 410U - Selected Topics (4) (Credit to be arranged.)
Span 411 - Advanced Spanish (4) Intensive training in composition, translation, and conversation. May be taken concurrently with Span 414 or Span 514. Also offered for graduate-level credit as Span 511 and may be taken only once for credit.
Prerequisite: Span 301, Span 302, and Span 303.

Span 414 - Advanced Spanish Grammar (4)
A thorough study of grammar and syntax for majors and prospective teachers. May be taken concurrently with Span 411 or Span 511. Also offered for graduate-level credit as Span 514 and may be taken only once for credit.
Prerequisite: Span 301, Span 302, and Span 303.

Span 421 - Major Topics: Peninsular Prose (4)
Study, analysis, and critique of major prose works of Spain by authors such as Fernando de Rojas, Cervantes, Galdos, Unamuno, and Goytisolo. Also offered for graduate-level credit as Span 521 and may be taken only once for credit.
Prerequisite: 8 credits of Span 341, Span 342, Span 343, Span 344, or Span 345.

Span 422 - Major Topics: Peninsular Drama (4)
Study, analysis, and critique of major dramatic works of Spain by authors such as Lope de Vega, Tirso de Molina, Calderon de la Baraca, Zorrilla, Garcia Lorca, and Buero Vallejo. Also offered for graduate-level credit as Span 522 and may be taken only once for credit.
Prerequisite: 8 credits of Span 341, Span 342, Span 343, Span 344, or Span 345.

Span 422U - Major Topics: Peninsular Drama (4)
Study, analysis, and critique of major dramatic works of Spain by authors such as Lope de Vega, Tirso de Molina, Calderon de la Baraca, Zorrilla, Garcia Lorca, and Buero Vallejo. Recommended prerequisites: 8 credits of Span 341, 342, or 343.

Span 423 - Major Topics: Peninsular Poetry (4)
Study, analysis, and critique of the poetry of Spain by authors such as Berceo, Gongora, Quevedo, Machado, Jimenez, and Cernuda. Also offered for graduate-level credit as Span 523 and may be taken only once for credit.
Prerequisite: 8 credits of Span 341, Span 342, Span 343, Span 344, or Span 345.

Span 423U - Major Topics: Peninsular Poetry (4)
Study, analysis, and critique of the poetry of Spain by authors such as Berceo, Gongora, Quevedo, Machado, Jimenez, and Cernuda. Recommended prerequisites: 8 credits of Span 341, 342, or 343.

Span 427 - Major Topics: Latin American Prose (4)
Study, analysis, and critique of major prose works of Latin America by authors such as Garcia Marquez, Fuentes, Paz, Vargas Llosa, Mastretta, and Borges. Also offered for graduate-level credit as Span 527 and may be taken only once for credit.
Prerequisite: 8 credits of Span 341, Span 342, Span 343, Span 344, or Span 345.
Span 428 - Major Topics: Latin American Drama (4)
Study, analysis, and critique of major dramatic works of Latin America by authors such as Gambaro, Benedetti, Usigli, Diaz, and de la Parra. Also offered for graduate-level credit as Span 528 and may be taken only once for credit.
Prerequisite: 8 credits of Span 341, Span 342, Span 343, Span 344, or Span 345.

Span 429 - Major Topics: Latin American Poetry (4)
Study, analysis, and critique of major prose works of Latin America, by authors such as Dario, Huidobro, Vallejo, Neruda, Guillen, and Mistral. Also offered for graduate-level credit as Span 529 and may be taken only once for credit.
Prerequisite: 8 credits of Span 341, Span 342, Span 343, Span 344, or Span 345.

Span 430 - Major Topics: Ibero-American Film (4)
Study, analysis, and critique of films from Ibero-America on such topics as national film traditions, Cinema Novo, Third Cinema, violence, migration, gender studies, and globalization. Course may be repeated for credit when topics vary. Also offered for graduate-level credit as Span 530 and may be taken only once for credit.
Prerequisite: 8 credits of Span 341, Span 342, Span 343, Span 344, or Span 345.

Span 434 - Major Topics: Peninsular Multiple Genres (4)
Study, analysis, and critique of works in multiple genres on such topics as Medieval Literature, the Celestina, Women Writers, Literature of the Franco Years, the Poetry Drama of Garcia Lorca, and the Generation of '98. Course may be repeated for credit when topics vary. Also offered for graduate-level credit as Span 534 and may be taken only once for credit.
Prerequisite: 8 credits of Span 341, Span 342, Span 343, Span 344, or Span 345.

Span 436 - Major Topics: Latin American Multiple Genres (4)
Study, analysis, and critique of works in multiple genres on such topics as Transvestism, Feminism, Sickness Literature, Prose Poetry of Borges, and Pre-Colombian Literature. Course may be repeated for credit when topics vary. Also offered for graduate-level credit as Span 536 and may be taken only once for credit.
Prerequisite: 8 credits of Span 341, Span 342, Span 343, Span 344, or Span 345.

Span 441 - Major Works in Translation (4)
Study of selections from masterpieces in translation by authors such as Cervantes, Neruda, Borges, Lispector, and Garcia Marquez. Readings, lectures, and discussions in English. Also offered for graduate-level credit as Span 541 and may be taken only once for credit. Recommended prerequisite: 4 credits of upper division literature.

Span 490 - History of the Spanish Language (4)
Study of the development of the Spanish language in terms of phonological, morphological, and syntactical changes. Also offered for graduate-level credit as Span 590 and may be taken only once for credit.
Prerequisite: Span 301, Span 302, Span 303, and Span 325.

Span 494 - Spanish Linguistics (4)
Introduction to the basic concepts of linguistics and their application to the Spanish language. Emphasis on practical analysis of the sound system and the grammatical system. Brief survey of the historical development, followed by an analysis of the phonetics, phonemics, morphology, and syntax of modern Spanish. Must be taken in sequence. Also offered for graduate-level credit as Span 594 and may be taken only once for credit.
Prerequisite: Span 301, Span 302, Span 303, and Span 325. Expected preparation: 4 credits of linguistics.

Span 495 - Spanish Dialectology (4)
Study of Spanish dialects with attention to geographic regions that differentiate the Spanish speaking world including official and unofficial varieties of Spanish in Europe, the Americas, Africa, and Asia. Also offered for graduate-level credit as Span 595 and may be taken only once for credit.
Prerequisite: Span 325.

Span 497 - Applied Spanish Linguistics (4)
A practical application of linguistics to modern Spanish. Emphasis on a contrastive analysis of the structure of Spanish and English. Also offered for graduate-level credit as Span 597 and may be taken only once for credit.
Prerequisite: Span 301, Span 302, and Span 303. Expected preparation: 4 credits of linguistics.

Span 498 - Spanish Syntax (4)
A practical approach to Spanish Syntax. Study and analysis of syntactical functions and sentence structure. Emphasis on modern grammatical theory and findings. Examination of discourse connectors. Also offered for graduate-level credit as Span 598 and may be taken only once for credit.
Prerequisite: Span 301, Span 302, and Span 303. Expected preparation: 4 credits of linguistics.

Span 501 - Research (1-9)
(Credit to be arranged.)

Span 503 - Thesis (1-9)
(Credit to be arranged.)

Span 504 - Cooperative Education/Internship (1-9)
(Credit to be arranged.)

Span 507 - Seminar (1-6)
(Credit to be arranged.)

Span 508 - Workshop (1-6)
(Credit to be arranged.)

Span 509 - Practicum (1-9)
(Credit to be arranged.)

Span 510 - Selected Topics (1-6)
(Credit to be arranged.)

Span 511 - Advanced Spanish (4)
Intensive training in composition, translation, and conversation. May be taken concurrently with Span 414 or Span 514. Also offered for undergraduate-level credit as Span 411 and may be taken only once for credit.
Prerequisite: Span 301, Span 302, and Span 303.
Span 514 - Advanced Spanish Grammar (4)
A thorough study of grammar and syntax for majors and prospective teachers. May be
taken concurrently with Span 411 or Span 511. Also offered for undergraduate-level
credit as Span 414 and may be taken only once for credit.
Prerequisite: Span 301, Span 302, and Span 303.

Span 521 - Major Topics: Peninsular Prose (4)
Study, analysis, and critique of major prose works of Spain by authors such as Fernando
de Rojas, Cervantes, Galdos, Unamuno, and Goytisolo. Also offered for undergraduate-level
credit as Span 421 and may be taken only once for credit.
Prerequisite: 8 credits of Span 341, Span 342, Span 343, Span 344, or Span 345.

Span 522 - Major Topics: Peninsular Drama (4)
Study, analysis, and critique of major dramatic works of Spain by authors such as Lope
de Vega, Tirso de Molina, Calderon de la Baraca, Zorrilla, Garcia Lorca, and Buero Vallejo. Also offered for undergraduate-level
credit as Span 422 and may be taken only once for credit.
Prerequisite: 8 credits of Span 341, Span 342, Span 343, Span 344, or Span 345.

Span 523 - Major Topics: Peninsular Poetry (4)
Study, analysis, and critique of the poetry of Spain by authors such as Bercero, Gongora, Quevedo, Machado, Jimenez, and Cernuda. Also offered for undergraduate-level credit as Span 423 and may be taken only once for credit.
Prerequisite: 8 credits of Span 341, Span 342, Span 343, Span 344, or Span 345.

Span 527 - Major Topics: Latin American Prose (4)
Study, analysis, and critique of major prose works of Latin America by authors such as Garcia Marquez, Fuentes, Paz, Vargas Llosa, Mastretta, and Borges. Also offered for undergraduate-level credit as Span 427 and may be taken only once for credit.
Prerequisite: 8 credits of Span 341, Span 342, Span 343, Span 344, or Span 345.

Span 528 - Major Topics: Latin American Drama (4)
Study, analysis, and critique of major dramatic works of Latin America by authors such as Gambaro, Benedetti, Usigli, Diaz, and de la Parra. Also offered for undergraduate-level credit as Span 428 and may be taken only once for credit.
Prerequisite: 8 credits of Span 341, Span 342, Span 343, Span 344, or Span 345.

Span 529 - Major Topics: Latin American Poetry (4)
Study, analysis, and critique of major prose works of Latin America, by authors such as Dario, Huidobro, Vallejo, Neruda, Guillen, and Mistral. Also offered for undergraduate-level credit as Span 429 and may be taken only once for credit.
Prerequisite: 8 credits of Span 341, Span 342, Span 343, Span 344, or Span 345.

Span 530 - Major Topics: Ibero-American Film (4)
Study, analysis, and critique of films from Ibero-America on such topics as national film traditions, Cinema Novo, Third Cinema, violence, migration, gender studies, and globalization. Course may be repeated for credit when topics vary. Also offered for undergraduate-level credit as Span 430 and may be taken only once for credit.
Prerequisite: 8 credits of Span 341, Span 342, Span 343, Span 344, or Span 345.

Span 534 - Major Topics: Peninsular Multiple Genres (4)
Study, analysis, and critique of works in multiple genres on such topics as Medieval Literature, the Celestina, Women Writers, Literature of the Franco Years, the Poetry Drama of Garcia Lorca, and the Generation of ’98. Course may be repeated for credit when topics vary. Also offered for undergraduate-level credit as Span 434 and may be taken only once for credit.
Prerequisite: 8 credits of Span 341, Span 342, Span 343, Span 344, or Span 345.

Span 535 - Hispanic Multiple Genres (4)
Critical study of the lyric poetry of Latin America and/or Spain.

Span 551 - Hispanic Poetry (4)
Critical study of representative works of Latin American and/or Spanish drama.

Span 552 - Hispanic Drama (4)
Critical study of works of Latin America and/or Spain.

Span 553 - Hispanic Prose (4)
Critical study of works of Latin America and/or Spain.

Span 554 - Hispanic Multiple Genres (4)
Critical works of Latin American and/or Spanish authors.

Span 590 - History of the Spanish Language (4)
Study of the development of the Spanish language in terms of phonological, morphological, and syntactical changes. Also offered for undergraduate-level credit as Span 490 and may be taken only once for credit.
Prerequisite: Span 301, Span 302, Span 303, and Span 325.

Span 594 - Spanish Linguistics (4)
Introduction to the basic concepts of linguistics and their application to the Spanish language. Emphasis on practical analysis of the sound system and the grammatical system. Brief survey of the historical development, followed by an analysis of the phonetics, phonemics, morphology, and syntax of modern Spanish. Must be taken in sequence. Also offered for undergraduate-level credit as Span 494 and may be taken only once for credit.
SpEd 406 - Special Problems (1-6)
(Credit to be arranged.)
SpEd 407 - Seminar (1-6)
(Credit to be arranged.)
SpEd 408 - Workshop (1-6)
(Credit to be arranged.)
SpEd 409 - Practicum (1-12)
(Credit to be arranged.)
SpEd 410 - Experimental Course (1-12)
(Credit to be arranged.)
SpEd 417 - Introduction to Special Education (4)
Provides an introduction to the field of special education and the use of evidence-based teaching practices in special education. Students explore particular career options of interest and participate in a community-based learning experience in public school settings with learners who are at-risk or have special education needs. Recommended prerequisite (or concurrent enrollment): Psy 311, SpEd 418.
SpEd 418 - Survey of Exceptional Learners (3)
Overview of working with exceptional individuals, including special education and multicultural differences. Nature of diversities (including the talented and gifted) and educational ramifications for the teacher. Also offered for graduate-level credit as SpEd 518 and may be taken only once for credit. Expected preparation: Psy 311.
SpEd 419 - Principles of Special Education (3)
Prepares students entering special education with basic knowledge, skills, and values necessary for future success in their profession. Major overview of theory and research underlying delivery of special education services in the public schools. Intensive study of career planning, graduate writing and research, information systems, current legislation, teaching and learning theory, curricular models, and professional ethics and standards. Also offered for graduate-level credit as SpEd 519 and may be taken only once for credit. Expected preparation (or concurrent enrollment): Psy 311, SpEd 418.
SpEd 455 - Working With LEP Children Who Have Special Needs (2)
Examine the current research in special education and see where it is appropriate in working with the Limited English Proficient (LEP) child. Consider issues including testing and diagnosis, appropriate teaching material and method, and placement. Discuss political, social, and community concerns in working with LEP students with special needs. Also offered for graduate-level credit as SpEd 555 and may be taken only once for credit.
SpEd 460 - Outdoor Education/Recreation With Persons With Disabilities (6)
Course provides a supervised practicum in a variety of outdoor activities with children, youth, and adults with disabilities. Students serve as counselor trainees, under the guidance of experienced outdoor specialists and teachers in a residential program located at the Mt. Hood Kiwanis Camp. Emphasis on learning from and about persons with disabilities, teamwork within living groups, and developing outdoor and leadership skills. Also offered for graduate-level credit as SpEd 560 and may be taken only once for credit.
SpEd 480 - Introduction to Early Intervention/Early Childhood Special Education (3)
Provides historical, social, and legal foundations for early intervention and early childhood special education and other services to young children with special needs. Introduces concepts and processes for screening and assessment, family-centered planning, blending developmentally and individually appropriate practices, providing learning opportunities in natural early childhood settings, planning environments and activities to include all children, and transition planning. Also offered for graduate-level credit as SpEd 580 and may be taken only once for credit. Expected preparation: admission to program or permission of instructor.
SpEd 481 - Family Guided Early Intervention (3)
Develops knowledge and skills necessary for providing early intervention services to infants and toddlers with developmental delay/disabilities and their families. Also
offered for graduate-level credit as SpEd 581 and may be taken only once for credit.

**SpEd 482 - Specialized Techniques: Early Intervention/Early Childhood Special Education (3)**

Develops specialized knowledge and skills necessary for providing early intervention and early childhood special education services to infants, toddlers, and preschool children with severe and multiple disabilities, including children with physical and sensory impairments, children with health impairments, and children with autism. Also offered for graduate-level credit as SpEd 582 and may be taken only once for credit.

**SpEd 483 - Communication and Language Development: EI/SE (Early Intervention/Early Childhood Special Education) (3)**

Designed to provide information about typical and atypical communication development, birth through early childhood. In addition, information will include strategies for EI/SE to promote communication development for all children. Also offered for graduate-level credit as SpEd 583 and may be taken only once for credit. Expected preparation: SpEd 480/580 and admission to program.

**SpEd 501 - Research (1-9)**

(Credit to be arranged.)

**SpEd 502 - Independent Study (0-9)**

(Credit to be arranged.)

**SpEd 503 - Thesis (1-9)**

(Credit to be arranged.)

**SpEd 504 - Cooperative Education/Internship (1-9)**

(Credit to be arranged.)

**SpEd 505 - Reading and Conference (1-6)**

(Credit to be arranged.)

**SpEd 506 - Special Problems (1-6)**

(Credit to be arranged.)

**SpEd 507 - Seminar (1-6)**

(Credit to be arranged.)

**SpEd 508 - Workshop (1-6)**

(Credit to be arranged.)

**SpEd 509 - Practicum (1-9)**

(Credit to be arranged.)

**SpEd 510 - Experimental Course (1 - 12)**

Experimental course. Contact the department for a course description. (Credit to be arranged.)

**SpEd 512 - Diagnostic Assessment (3)**

Examination and application of diagnostic/assessment procedures and instruments used to appraise current academic performance of K-12 students with intellectual, learning, and behavioral disabilities. Prospective special education teachers will develop the foundational knowledge and skills to: collect background information on students; select, administer, and interpret the results of norm-referenced assessment tools; and develop reports that are meaningful to teachers and parents and abide by federal, state, and professional guidelines.

Prerequisite: SpEd 519 and admission to program.

**SpEd 513 - Classroom Based Assessment and Instructional Planning (3)**

Informal, formative, ongoing assessment techniques used for students with special needs in special and regular education settings. Using information from assessments to make instructional decisions and for IEP documentation and planning.

Prerequisite: SpEd 519 and admission to program.

**SpEd 518 - Survey of Exceptional Learners (3)**

Overview of working with exceptional individuals, including special education and multicultural differences. Nature of diversities (including the talented and gifted) and educational ramifications for the teacher. Also offered for undergraduate-level credit as SpEd 418 and may be taken only once for credit. Expected preparation: Psy 311.

**SpEd 519 - Principles of Special Education (3)**

Prepares students entering special education with basic knowledge, skills, and values necessary for future success in their profession. Major overview of theory and research underlying delivery of special education services in the public schools. Intensive study of career planning, graduate writing and research, information systems, current legislation, teaching and learning theory, curricular models, and professional ethics and standards. Also offered for undergraduate-level credit as SpEd 419 and may be taken only once for credit. Expected preparation (or concurrent enrollment): Psy 311, SpEd 418.

**SpEd 520 - Collaboration I: Families and Community - EL and EI/SE (3)**

Designed to develop knowledge in the areas of family systems theory, strengths-based model, information gathering techniques, and collaboration techniques with families and professionals. Information related to cultural competence is infused throughout the course. In addition, students receive information on grief related to having a child with a disability and the death of a student. Students are required to participate in a family conversation project to identify family strengths, concerns, and resources with a family who has a child with special needs.

Prerequisite: admission to program.

**SpEd 521 - Behavior Management in the Classroom (3)**

Primary emphasis will be on observation of classroom behavior with concomitant development of alternatives for intervention in helping children develop more appropriate behavioral skills.

**SpEd 522 - Collaboration II: Inclusion Strategies (ECE/Elementary) (3)**

Designed to help preservice teachers learn collaborative strategies that facilitate the inclusion of students with disabilities into the general education program.

Prerequisite: SpEd 520 or permission of instructor.

**SpEd 523 - Collaboration I: Work-Based Learning and Transition (Mid-level/High School) (3)**

Designed to help preservice teachers learn collaborative strategies that facilitate the inclusion of students with disabilities in the areas of career development and transition planning.

Prerequisite: SpEd 519 and admission to program.
SpEd 524 - Collaboration II: Schools and Inclusion Strategies (Mid-level/High School) (3)

Designed to help preservice teachers learn collaborative strategies that facilitate the inclusion of students with disabilities into the general education program.
Prerequisite: SpEd 523 or permission of instructor.

SpEd 525 - Student Teaching (6-15)
Observation and teaching under the direction of a supervising teacher. Opportunities for assuming direct responsibility for the learning activities of the disabled learner, for developing skill in techniques of teaching and schoolroom management, and for participating in the life of the school.
Prerequisite: Satisfactory completion of SpEd 509 Directed Field Experience II.

SpEd 526 - Instructional Methods I: Literacy (Elementary) (3)
Designed to help preservice teachers learn methods and curriculum for teaching reading and language arts skills to children with special needs.
Prerequisite: SpEd 519, Ed 511, and admission to program.

SpEd 527 - Instructional Methods II: Math (Elementary) (3)
Students will examine curriculum and learn explicit methods for teaching mathematics concepts and skills to children with special needs.
Prerequisite: SpEd 519 and admission to program.

SpEd 528 - Instructional Methods I: Literacy (Midlevel/High School) (3)
Develops knowledge and practices for teaching reading, writing, and other literacy skills to middle and secondary students with high incidence disabilities. Curriculum and instructional methods for students who are emergent, developing, and fluent readers and writers are addressed. The development of student’s use of learning strategies to become more independent and effective learners is described.
Prerequisite: SpEd 519, Ed 511, and admission to program.

SpEd 529 - Instructional Methods II: Math and Content Instruction (Mid-level/High School) (3)
Purpose of this course is for preservice and practicing educators to develop the knowledge and skills to effectively teach mathematics and other content area subjects to students with mild disabilities in middle/secondary schools. Educators will learn how to use instructional methods and content enhancement devices to make curricular content more accessible for students with disabilities. Strategies for promoting retention, application, and generalization of content learning will also be examined.
Prerequisite: SpEd 519 and admission to program.

SpEd 532 - Functional Assessment and Curriculum I (4)
Develops philosophical and social foundations for services to individuals with significant and multiple disabilities, early childhood through adulthood. Emphasizes ecological and functional assessment strategies for life skills, communication, social, motor, and functional academic domains. Strategies for including students with significant and multiple disabilities in systemwide, standards-based assessment are addressed.
Prerequisite: admission to appropriate special education cohort or permission of instructor.

SpEd 534 - Functional Assessment and Curriculum II (4)
Applies knowledge and skills for functional assessment and applied behavior analysis in the design and implementation of an individualized, functional curriculum for students with significant and multiple disabilities, early childhood through adulthood. Emphasizes curricular content for life skills, communication, social, motor, and cognitive/functional academic domains. Provides instructional strategies for routines-based, naturalistic, and teacher-directed learning. Includes strategies for using positive behavioral supports for students with significant disabilities, based upon functional behavioral assessment and analysis.
Prerequisite: SpEd 532 and admission to the program.

SpEd 536 - Specialized Techniques (3)
Information and skills development for meeting the specialized support needs commonly found with students with significant disabilities. Focus on educational implications considering (1) the nature of the medical condition, (2) methods for instruction (i.e., positioning, mobility), and (3) procedures for structural modifications. Course incorporates information from various disciplines and is designed to assist the educator in becoming an effective member of a transdisciplinary team that serves students with routine and emergency medical and physical needs.
Prerequisite: SpEd 418/518 and admission to the program.

SpEd 540 - Education of the Visually Impaired Learner (3)
Beginning with a historical background of the education of the visually disabled, this course provides an overview of basic information about visually impaired children and youth. Basic programming components and implications for conceptual and motoric development. Basic curricular components necessary for the visually impaired, leading to transition from school to adult life.
Prerequisite: SpEd 418/518 and admission to the program.

SpEd 541 - Implications of Vision Problems of Children/Youth (3)
Anatomy, physiology, common diseases, and hygiene of the human eye. Emphasis on vision screening, testing, and techniques for evaluation of functional visual skills in the classroom. Focus includes strategies for improving medical/ optometric eye reports. Emphasis on working with the regular classroom teacher regarding prevention of potential eye disorders and referral to eye specialists.
Prerequisite: SpEd 540 and admission to the program.

SpEd 542 - Assessment of the Visually Impaired (3)
Examination and application of diagnostic and assessment instruments useful with or modified for visually impaired learners. Designed to prepare teachers of the visually disabled for administering, scoring, and interpreting test results for program planning and implementation.
Developmental areas include cognition, social/emotional skills, psychomotor skills, and self-help skills.

Prerequisite: SpEd 418/518 and admission to the program.

SpEd 543 - Reading and Literacy - Visually Impaired Learners (3)

This course provides an overview of language development and literacy instruction from prereading through adolescence. Age-appropriate methods for literacy instruction will be discussed, with emphasis on similarities and differences between sighted print readers and readers with visual impairments, including blindness. Both conventional and functional literacy will be addressed.

Prerequisite: SpEd 418/518 and admission to the program.

SpEd 544 - Methods of Teaching Academics: Visually Impaired Learner (3)

Course focuses upon curricular adaptations for use with the visually impaired learner in the classroom. Academic areas examined and strategies for inclusion for the visually impaired learner in all aspects of the school curriculum. Teaching of Braille, use of abacus for mathematics, and adapted materials. In-depth curricular focus for the multi-disabled child.

Prerequisite: SpEd 418/518 and admission to the program.

SpEd 545 - Orientation and Mobility/Life Skills (3)

Focus on teaching independent travel skills to totally or functionally blind students. Methods and techniques presented to help the special and regular class teacher promote success in daily living skills as well.

Prerequisite: SpEd 418/518.

SpEd 546 - Braille I (3)

The Braille code is presented, to include Grade II literary Braille, and use of the abacus.

Prerequisite: SpEd 540 and admission to the program.

SpEd 547 - Braille II (2)

All special signs and symbols relating to the literary code are learned and special formatting techniques used in printed materials, charts, and graphs. Study of Braille Nemeth Code for mathematics.

Prerequisite: SpEd 546 and admission to the program.

SpEd 553 - Leisure Education for Persons with Disabilities (3)

Focuses on recreation and leisure as a major aspect of independent living and community adjustment. Roles of the schools in providing a comprehensive leisure education program for students with disabilities.

Prerequisite: SpEd 418/518.

SpEd 555 - Working With LEP Children Who Have Special Needs (2)

Examine the current research in special education and see where it is appropriate in working with the Limited English Proficient (LEP) child. Consider issues including testing and diagnosis, appropriate teaching material and method, and placement. Discuss political, social, and community concerns in working with LEP students with special needs. Also offered for undergraduate-level credit as SpEd 455 and may be taken only once for credit.

SpEd 556 - Career Education for Persons with Disabilities (3)

Course presents a broad conceptual framework for organizing and developing career education programs for disabled students (elementary/young adult); helps participants gain knowledge which strengthens vocational success for disabled persons; and program models train persons with disabilities in transition from school to community life.

Prerequisite: SpEd 418/518.

SpEd 557 - Assessment and Planning for Students With Mild Disabilities (3)

Primarily concerned with educational methods designed to teach students with severe to moderate response deficits in reading.

Prerequisite: CI 474/574.

SpEd 564 - Learning Disabilities (3)

Concepts, issues, and major sources in the field of learning disabilities: definition, causation and identification, ability vs. task analysis models, perceptual training, and aptitude treatment interaction, early identification, and reading disability.

SpEd 568 - Advanced Behavior Management (3)

Course for educational professionals serving students with challenging behavior. Focuses on a continuum of behavioral intervention in schools including functional behavioral assessment and positive behavioral supports for students with challenging behavior.

Prerequisite: SpEd 521.

SpEd 570 - Communication Systems for Persons with Severe Disabilities (3)

Course for students who will be teaching communication skills to persons with severe disabilities, including nonverbal individuals. Examines specialized systems for teaching communication skills, normal speech, and implementation of communication instruction.

Prerequisite: SpEd 418/518.

SpEd 571 - Adolescents with Learning Differences (2)

Explores the impact of various disabilities or other life experiences on learning and the developmental stage of adolescence. Examines what middle and high school teachers need to understand about students with learning differences and how they can provide support and accommodations.

Prerequisite: admission to SDEP program.

SpEd 573 - Assessment and Planning for Students With Mild Disabilities (3)

Examination and application of diagnostic and assessment instruments used to measure cognitive language abilities and social/emotional functioning. Formal and informal methods of assessment.
Prerequisite: SpEd 418/518.

SpEd 575 - Braille III/Technology for the Visually Impaired (3)

Study of computer applications for visually impaired learners, including existing and proposed hardware and software that would improve accessibility to print information by visually impaired and blind students. Adaptations of existing technology, evaluation of its effectiveness.
Prerequisite: SpEd 540.

SpEd 576 - Visually Impaired Learner with Additional Disabilities (3)

Study of visually handicapped students with concomitant disabilities such as hearing impairments, mental retardation, and behavior disorders. Emphasis on curricular adaptations, teaching strategies, and behavior management.
Prerequisite: SpEd 418/518.

SpEd 580 - Introduction to Early Intervention/Early Childhood Special Education (3)

Provides historical, social, and legal foundations for early intervention and early childhood special education and other services to young children with special needs. Introduces concepts and processes for screening and assessment, family-centered planning, blending developmentally and individually appropriate practices, providing learning opportunities in natural early childhood settings, planning environments and activities to include all children, and transition planning. Also offered for undergraduate-level credit as SpEd 482 and may be taken only once for credit.
Prerequisite: admission to program or permission of instructor.

SpEd 581 - Family Guided Early Intervention (3)

Develops knowledge and skills necessary for providing early intervention services to infants and toddlers with developmental delay/disabilities and their families. Also offered for undergraduate-level credit as SpEd 481 and may be taken only once for credit.

SpEd 582 - Specialized Techniques: Early Intervention/Early Childhood Special Education (3)

Develops specialized knowledge and skills necessary for providing early intervention and early childhood special education services to infants, toddlers, and preschool children with severe and multiple disabilities, including children with physical and sensory impairments, children with health impairments, and children with autism. Also offered for undergraduate-level credit as SpEd 482 and may be taken only once for credit.

SpEd 583 - Communication and Language Development: EI/SE (Early Intervention/Early Childhood Special Education) (3)

Designed to provide information about typical and atypical communication development, birth through early childhood. In addition, information will include strategies for EI/SE to promote communication development for all children. Also offered for undergraduate-level credit as SpEd 483 and may be taken only once for credit. Expected preparation: SpEd 480/580 and admission to program.

SpEd 584 - Assessment: EI/SE (3)

Provides an overview of assessment procedures in the field of early intervention/early childhood special education. These procedures include screening and testing using norm-referenced, criterion-referenced, curriculum-based, and observational methods. Reliability and validity of assessments are discussed in relation to standardized testing. Learners have the opportunity to observe and record the behaviors of young children. Assessment strategies such as arena assessment, play-based assessment, parent reporting, and family interviewing. Emphasis on the assessment process for the young child and the family's role in the assessment of the young child with developmental delays or disabilities.

SpEd 585 - Instructional Strategies I: EI/SE (3)

Develops knowledge and practices for teaching and facilitating development of children with special needs, birth through the primary grades. Builds upon the student's knowledge of child development and developmentally appropriate practices.

SpEd 586 - Instructional Strategies II: EI/SE (3)

Develops advanced knowledge and practices for teaching and facilitating development of children with special needs, birth through the primary grades. Builds upon the student’s knowledge of individually appropriate practice, applied behavior analysis, and design of individual and group plans for instruction. Develops knowledge and skills for implementation of specific strategies supported by current research and recommended practices, including strategies to support early relationships, peer interaction, social-emotional development, cognitive development, and early literacy.

SpEd 587 - Behavioral Assessment (5)

Designed for students to learn the fundamental elements of behavior assessment, how to identify behaviors appropriate for behavioral assessment, selecting behavior goals and strategies, ethical and professional issues that may arise during the process of behavioral assessment.
Prerequisite: Admission in the PSU BCBA program and completion of SpEd 588.

SpEd 588 - Foundations of Applied Behavior Analysis (3)

Introduction to the Board Certified Behavior Analyst (BCBA) course sequence designed to prepare students to take the BCBA exam. Specifically designed to provide students with the knowledge of ABA terms as well as the application of positive behavior support and technological methods specific to the needs of your community. This is the first course in a sequence of six: SpEd 588, SpEd 589, SpEd 590, SpEd 591, SpEd 592, SpEd 593 and must be taken in sequence.
Prerequisite: Admission to the PSU BCBA program.
**SpEd 589 - Behavioral Assessment (5)**
Designed for students to learn the fundamental elements of behavior assessment, how to identify behaviors appropriate for behavioral assessment, selecting behavior goals and strategies, ethical and professional issues that may arise during the process of behavioral assessment. This is the second course in a sequence of six: SpEd 588, SpEd 589, SpEd 590, SpEd 591, SpEd 592, SpEd 593 and must be taken in sequence.
Prerequisite: Admission in the PSU BCBA program; SpEd 588.

**SpEd 590 - Positive Behavior Support (5)**
This course is designed to provide students with the knowledge of ethical application of positive behavior support and technological methods specific to the needs of your local community identified in the technology project for this course. This is fifth course in a sequence of six: SpEd 588, SpEd 589, SpEd 590, SpEd 591, SpEd 592, SpEd 593 and must be taken in sequence.
Prerequisite: Admission in the PSU BCBA program; SpEd 588, SpEd 589, SpEd 590, SpEd 591.

**SpEd 593 - Advanced Single Subject Design (4)**
Designed for students to learn measurement and design considering behavior change, system support, implementation, management, supervision and ethical and professional issues relevant to the practice of behavioral intervention and research design. This is sixth course in a sequence of six: SpEd 588, SpEd 589, SpEd 590, SpEd 591, SpEd 592, SpEd 593 and must be taken in sequence.
Prerequisite: Admission in the PSU BCBA program; SpEd 588, SpEd 589, SpEd 590, SpEd 591, SpEd 592.

**SpEd 594 - Assessment Methods and Classification in Infant Mental Health (3)**
Develop knowledge and skills to complete the assessment process of infants, toddlers and their caregivers through multiple sources of information within a culturally relevant context. Topics include selection of tools and methods for information collection, methods for screening and assessment, and use of classification systems within the mental health system.
Prerequisite: Admission in the PSU BCBA program; SpEd 588, SpEd 589, SpEd 590, SpEd 591, SpEd 592.

**SpEd 596 - Topics in Special Education Research (3)**
Specialized topics in special education focused on the scientific process and the development of research-based practice. Research regarding theories, interventions, instructional strategies, curriculum, and assessment are examined for each topic. Sections address topics such as: Literacy, English Language Learners, Positive Behavior Intervention Supports and Students with Significant Disabilities.

**SpEd 597 - Topics in Special Education Issues and Practices (3)**
Specialized topics in special education focused on issues and practices in the education of students with disabilities. Current practices and issues, evidence-based practices, the use of research and assessment to understand problems, and the implementation and evaluation of interventions are examined for each topic. Topics such as the following are included: Literacy, English Language Learners, Positive Behavior Intervention Supports, Students with Significant Disabilities.

**SpEd 601 - Research (1-9)**
(Credit to be arranged.)

**SpEd 602 - Independent Study (1-9)**
(Credit to be arranged.)

**SpEd 603 - Dissertation (1-16)**
(Credit to be arranged.)

**SpEd 604 - Cooperative Education/Internship (1-9)**
(Credit to be arranged.)

**SpEd 605 - Reading and Conference (1-9)**
(Credit to be arranged.)

**SpEd 606 - Special Problems (1-9)**
(Credit to be arranged.)

**SpEd 607 - Seminar (1-9)**
(Credit to be arranged.)

**SpEd 608 - Workshop (1-9)**
(Credit to be arranged.)

**SpEd 609 - Practicum (1-9)**
(Credit to be arranged.)

**SpEd 610 - Selected Topics (1-9)**
(Credit to be arranged.)
SpEd 801 - Research (0-9)  
(Credit to be arranged.)

SpEd 802 - Independent Study (0-9)  
(Credit to be arranged.)

SpEd 804 - Cooperative Education/Internship (0-9)  
(Credit to be arranged.)

SpEd 805 - Reading and Conference (0-9)  
(Credit to be arranged.)

SpEd 806 - Special Problems (0-9)  
(Credit to be arranged.)

SpEd 807 - Seminar (0-9)  
(Credit to be arranged.)

SpEd 808 - Workshop (0-9)  
(Credit to be arranged.)

SpEd 809 - Practicum (0-9)  
(Credit to be arranged.)

SpEd 810 - Experimental Course (0-9)  
(Credit to be arranged.)

SpHr 199 - Special Studies (0-15)  
(Credit to be arranged.)

SpHr 262 - Voice and Diction (4)  
Study and practice of principles of voice production and articulation of speech sound, with attention to elementary speech physiology and phonetics. Intended for students who desire to develop more effective speech and for meeting special needs of teachers, radio and television speakers, public speakers, and others who require special competence in speaking. Emphasis on both theory and practice. Two hours per week of laboratory work required.

SpHr 365U - Survey of Speech, Language, and Hearing Disorders (4)  
Designed as an overview of speech, language, and hearing in children and adults. Topics to include: cleft palate, stuttering, hearing impairment, and multi-cultural differences. Recommended for general speech students.

SpHr 365 - Survey of Speech, Language, and Hearing Disorders (4)  
Designed as an overview of speech, language, and hearing in children and adults. Topics to include: cleft palate, stuttering, hearing impairment, and multi-cultural differences. Recommended for general speech students.

SpHr 370U - Speech and Language Development in Children (4)  
Provides students with a foundation of knowledge regarding basic processes of language acquisition. In addition to the study of normal language development from a theoretical, developmental, and clinical perspective, related areas of study include cognition, social interactions, play, and literacy. Bilingual and multicultural issues are also addressed.

SpHr 370 - Phonetics and Acoustics (4)  
A study of sounds used in speech, their acoustic properties, and their transcription utilizing the IPA; description of sounds, their symbolic nature, their production, and physical and psychological problems involved in their perception. The acoustical bases of speech and hearing will also be addressed.

SpHr 371 - Anatomy and Physiology of Speech and Swallowing (4)  
A study of the anatomy and physiology of the respiratory, phonatory, and articulatory systems for speech, with applications to speech disorders. The physiology of swallowing and swallowing disorders is also covered.

SpHr 372 - Speech and Language Development in Children (4)  
Provides students with a foundation of knowledge regarding basic processes of language acquisition. In addition to the study of normal language development from a theoretical, developmental, and clinical perspective, related areas of study include cognition, social interactions, play, and literacy. Bilingual and multicultural issues are also addressed.

SpHr 372U - Speech and Language Development in Children (4)  
Provides students with a foundation of knowledge regarding basic processes of language acquisition. In addition to the study of normal language development from a theoretical, developmental, and clinical perspective, related areas of study include cognition, social interactions, play, and literacy. Bilingual and multicultural issues are also addressed.

SpHr 380 - Language Disorders in Children (4)  
An overview of developmental language disorders in children. Disorders will be presented in terms of etiology, incidence, and characteristics. Assessment issues and treatment principles will be discussed.

SpHr 380U - Language Disorders in Children (4)  
Prerequisite: SpHr 372.

SpHr 375 - Autism Spectrum Disorders (4)  
Examines current issues related to diagnosis and intervention for children and adolescents with autism spectrum disorders (ASD). It focuses on current research related to theories of development across varied domains (social and communicative, motor, sensory, cognitive and adaptive behaviors) and interdisciplinary practice for serving children with ASD.

SpHr 394 - Guided Observation (1)  
Designed to acquaint students with the clinical process in speech, language, and audiology cases. Students will observe phases of clinical operation including diagnostic management, parent conferencing, and material preparation.

SpHr 395 - Directed Clinical Assistanship (2)  
Designed to acquaint pre-professional students with the direct management of speech, language, and hearing cases in cooperation with advanced clinicians and under the direction of a qualified clinical supervisor. Students will participate in all phases of clinical operation, including scheduling, diagnostic management, parent conferencing, report writing, material preparation.

SpHr 399 - Special Studies (0-15)  
(Credit to be arranged.)

SpHr 401 - Research (0-15)  
(Credit to be arranged.) Consent of instructor. Use 501 to register for comprehensive exams.

SpHr 404 - Cooperative Education/Internship (1-15)  
(Credit to be arranged.)

SpHr 405 - Reading and Conference (0-15)  
(Credit to be arranged.) Consent of instructor.

SpHr 406 - Special Projects (1-8)  
(Credit to be arranged.) Consent of instructor.
SpHr 407 - Seminar (0-15)
(Credit to be arranged.) Consent of instructor.

SpHr 408 - Workshop (0-15)
(Credit to be arranged.)

SpHr 409 - Practicum (0-12)
(Credit to be arranged.) Students must show proof of professional liability insurance.

SpHr 410 - Selected Topics (0-12)
(Credit to be arranged.)

SpHr 410H - (1-12)

SpHr 432 - Alternative Medicine (4)
This course offers a general introduction to influential medical systems (i.e., Traditional Chinese Medicine, Western Homeopathy, Indian Ayurveda, etc.) in the world that are emerging in the U.S. as alternative medicines to the conventional (or allopathic) biomedicine. For senior level and graduate students of all majors who are interested in health and medicine, including those who are preparing for medical or allied health professions like speech-language pathology.

SpHr 452 - Screening in the Schools (1)
Students will participate, under supervision, in screening school-aged students for speech, language, and/or hearing disabilities.
Prerequisite: SpHr 498/598; 25 clock hours of practicum.

SpHr 461 - Neurology of Speech and Hearing (4)
A course specifically designed for speech and hearing majors to provide a study in-depth of the neurology of the speech and hearing mechanisms with special attention given to the major deviations affecting verbal communication. Also offered for graduate-level credit as SpHr 561 and may be taken only once for credit.

SpHr 464 - Speech Disorders in Children (4)
Discussion of normal speech development and how it can differ in individuals with speech disorders. Exploration of assessment, diagnosis, and treatment for speech disorders in children. Introduction to linguistic and cultural factors related to speech development and disorders, and to special populations with high incidence of speech disorders.
Prerequisite: SpHr 370, 372.

SpHr 465 - Introduction to Research Methods for Clinical Scientists (4)
Covers designs and data interpretation methods used in clinical research. Validity threats are highlighted and discussed in the context of clinical studies. Focus on application of research principles in the evaluation of journal articles, with the goal of enabling students to critically review the literature.
Prerequisite: Stat 243, Stat 244 or equivalent.

SpHr 470 - Audiometric Practicum (2)
Supervised clinical practice designed for Speech and Hearing Science majors. Practical training in basic pure-tone and speech audiometry, including audiometric screening of children and adults.
Prerequisite: SpHr 488/588.

SpHr 475 - Introduction to the Professions of Speech-Language Pathology and Audiology (4)
Overview of topics related to professional development in speech-language pathology and audiology, including professional behavior, ethical responsibility, scope of practice, interdisciplinary collaboration, professional affiliations, continuum of care, typical work settings, and applying to graduate schools.
Prerequisite: senior standing.

SpHr 480 - Introduction to Sociocultural Aspects of Interactions (4)
Introduction to communication and interaction on context and influence of context on communication disorders. Explores situational, social-interpersonal, and cultural variables. Examines systems theory and cultural practices as they influence communication.
Prerequisite: must be junior, undergraduate, or post-baccalaureate status.

SpHr 487 - Hearing Sciences (4)
Introductory course in audiology emphasizing basic acoustics and psychoacoustics, anatomy and physiology of the ear, hearing measurement, and types and causes of hearing impairment.
Prerequisite: upper-division standing.

SpHr 488 - Clinical Audiology (4)
Introduction to the audiological test battery. Topics include bone-conduction, masking, speech audiometry, and objective tests. Auditory pathologies and their audiometric correlates are also covered.
Prerequisite: SpHr 487; may be taken concurrently.

SpHr 489 - Aural Rehabilitation (4)
Theoretical course covering the role of speechreading (lip reading) and auditory training as it relates to speech, language, and communication. Historical perspectives and philosophies considered, communication systems, speech acoustics and perception, amplification and hearing aids, speech reading, and auditory training. Multicultural issues will be included. Also offered for graduate-level credit as SpHr 589 and may be taken only once for credit. Recommended prerequisite: SpHr 488/588.

SpHr 490 - Audiological Rehabilitation Clinic (2)
Supervised clinical practicum in the diagnosis and rehabilitation of children and adults with hearing disabilities; staff seminars in case dispositions. Maximum: 18 credits. Recommended prerequisite: SpHr 489/589, 498/598.

SpHr 495 - Organic Communication Disorders (4)
Introduction to speech and language disorders with emphasis on voice disorders, stuttering disorders and neurogenic disorders; cleft palate and cerebral palsy will complete the survey. Recommended prerequisite: SpHr 371.

SpHr 496 - Introduction to Clinical Management (4)
Provides an introduction to assessment and management of diverse persons with communication disorders across the lifespan. Covers basic principles of assessment and intervention, evidence-based practices, and behavior management. Introduces terminology and basic techniques for addressing speech, language, and hearing...
Prerequisite: SpHr 371, 372. Expected Preparation: SpHr 370.

SpHr 501 - Research (0-15)
(Credit to be arranged.) Consent of instructor. Use 501 to register for comprehensive exams.

SpHr 503 - Thesis (0-9)
Consent of instructor. Must register for minimum of 6 credits total, with at least 1 credit in term of defense. (Credit to be arranged.)

SpHr 504 - Cooperative Education/Internship (0-15)
(Credit to be arranged.)

SpHr 505 - Reading and Conference (0-9)
(Credit to be arranged.) Consent of instructor.

SpHr 506 - Special Projects (1-8)
(Credit to be arranged.) Consent of instructor.

SpHr 507 - Seminar (0-15)
(Credit to be arranged.) Consent of instructor.

SpHr 508 - Workshop (0-15)
(Credit to be arranged.)

SpHr 509 - Practicum (1-12)
(Credit to be arranged) Restricted to SpHr graduate students only. Students must show proof of professional liability insurance.

SpHr 510 - Selected Topics (0-15)
(Credit to be arranged.)

SpHr 530 - Clinical Management in Communication Disorders (4)
Focuses on principles of static and dynamic assessment, intervention planning and implementation, goal writing and data collection, and behavior management—including motivation and reinforcement—across diagnostic populations and developmental stages. Considers contextual influences and emphasizes evidence-based practices. Restricted to graduate students.

SpHr 540 - Multicultural Topics in Communication Disorders (4)
Introduces topics of communication disorders within the framework of culture and identity. Explores cultural attitudes and beliefs about communication and disabilities, cultural differences, cultural identity, second and bilingual language acquisition, and introduces assessment and intervention strategies for non-mainstream populations. May not be repeated for credit.

SpHr 550 - Special Projects (1-8)
(Credit to be arranged.) Consent of instructor.

SpHr 554 - Advanced Speech Sound Disorders: Theories and Application (4)
Prerequisite: SpHr 530.

SpHr 559 - Augmentative and Alternative Communication (2)
Focuses on communication characteristics of individuals with severe communication disorders and their use of augmentative and alternative communication to meet both pre-intentional and intentional and symbolic communication needs. Emphasis on holistic communication assessment methods and intervention strategies to enhance communication in children.

SpHr 560 - Advanced Multicultural Topics in Communication Disorders (2)
Prerequisite: SpHr 498/598; 25 clock hours of practicum.

SpHr 553 - Counseling in Communication Disorders (2)
Prerequisite: SpHr 530.

SpHr 555 - Advanced Speech Sound Disorders: Theories and Application (4)
Development and disorders of speech sound production, with particular emphasis on children. Phonological and phonetic theories used in understanding speech and speech sound development and disorders. Various means of assessing and providing intervention for speech sound disorders, including childhood apraxia of speech.

SpHr 556 - Professional Ethics (2)
Prerequisite: SpHr 530.

SpHr 557 - Counseling in Communication Disorders (2)
Prerequisite: SpHr 530.

SpHr 558 - Symbol Systems in Early Communication (2)
Focuses on communication characteristics of individuals with severe communication disorders and their use of augmentative and alternative communication to meet both pre-intentional and intentional and symbolic communication needs. Emphasis on holistic communication assessment methods and intervention strategies to enhance communication in children.

SpHr 559 - Augmentative and Alternative Communication (2)
Introductory course in augmentative and alternative communication (AAC) with a focus on manual and technological communication methods. Includes strategies for appropriate assessment of speech, language, cognitive, and sensory-motor skills, and addresses partner support requirements for AAC use. Students gain knowledge and skills for treating children, adolescents, and adults with moderate to
severe developmental or acquired disorders in speech and language.

Prerequisite: SpHr 530.

SpHr 560 - Research Methods in Communication Sciences and Disorders (4)
Introduction to research methods in communication sciences and disorders. Covers research strategies and designs commonly used in communication sciences and disorders, as well as methods used in the collection, analysis and interpretation of data. The course focuses on the application of research principles in the critical evaluation of journal articles and other research literature, with the goal of enabling students to make informed decisions as to which developments in communication disorders should be applied to clinical practice. The principles and processes of evidence-based, clinical practice are emphasized.

Prerequisite: Stat 243, 244 or equivalent.

SpHr 561 - Neurology of Speech and Hearing (4)
A course specifically designed for speech and hearing majors to provide a study in-depth of the neurology of the speech and hearing mechanisms with special attention given to the major deviations affecting verbal communication. Also offered for undergraduate-level credit as SpHr 461 and may be taken only once for credit.

SpHr 562 - Cognitive Rehabilitation (4)
Discusses causes, symptoms, prevention, assessment, and management of cognitive-communication disorders following acquired brain injury across the lifespan. Specific populations to be discussed include traumatic brain injury, stroke, and the dementias. Places emphasis on evidence-based clinical reasoning and applying the World Health Organization model to clinical management in rehabilitation settings. Restricted to graduate students.

SpHr 563 - Adult Language Disorders (4)
Provides in-depth clinical management of children with cleft lip and palate and other craniofacial syndromes. Particular emphasis placed on identification, description, assessment, and treatment of speech production, feeding, and psychosocial development. Explores evidence-based models of team care, including the role of other medical professionals.

Prerequisite: SpHr 370, SpHr 371, SpHr 530, and SpHr 554.

SpHr 570 - Audiometric Practicum (2)
Supervised clinical practice designed for Speech and Hearing Science majors. Practical training in basic pure-tone and speech audiometry, including audiometric screening of children and adults.

Prerequisite: SpHr 488/588.

SpHr 581 - Stuttering (3)
Covers disorders of fluency, including causes, symptoms, prevention, theories of stuttering, assessment, and management of stuttering in pediatrics and adults. Emphasis is placed on evidence-based clinical reasoning and applying the World Health Organization model to clinical management in a variety of practical settings.

Prerequisite: SpHr 530.

SpHr 582 - Voice Disorders (3)
Presents advanced information about the anatomy and physiology of normal and disordered voice production, including causes, symptoms, prevention, assessment, and management of voice disorders across the lifespan for organic and functional voice disorders.

Prerequisite: SpHr 530.

SpHr 584 - Assessment and Treatment of Language Disorders: Birth to Age Five (4)
Focuses on causation, evaluation, and management for addressing communication disorders in infants, toddlers, and preschool children with multiple challenges; particular emphasis on emerging communication across multiple developmental domains, with family-centered, interdisciplinary assessment and intervention. All topics target use of evidence-based practices and the influence of context on performance.

SpHr 585 - Assessment and Treatment of Language Disorders in School-aged Children and Adolescents (4)
Includes static, dynamic, and curriculum-based communication assessment of language, learning, and communication disorders. Discusses relation between language and learning disabilities, with focus on treatment of language-based disorders of reading and writing. Intervention emphasizes interdisciplinary service delivery
models. Topics target use of evidence-based practices and influence of context on performance.

Prerequisite: SpHr 584.

SpHr 586 - Autism (2)
Investigates current issues related to diagnosis and intervention for children and adolescents with autism spectrum disorders (ASD). Focuses on current research related to theories of social, communication, motor, sensory, cognitive, and adaptive behavior development. Emphasizes interdisciplinary nature of serving children with ASD. Restricted to graduate students.

SpHr 587 - Advanced Topics in Literacy in Children with Language Impairments (2)
Current topics specific to literacy disorders in children and adolescents with language impairment and other communication disorders. Specific topics may include review of typical literacy development, classification of literacy disorders, perspectives in teaching literacy, and assessment and intervention in areas including decoding, spelling, reading comprehension, digital literacy and written language.

Prerequisite: SpHr 585.

SpHr 589 - Aural Rehabilitation (4)
Theoretical course covering the role of speechreading (lip reading) and auditory training as it relates to speech, language, and communication. Historical perspectives and philosophies considered, communication systems, speech acoustics and perception, amplification and hearing aids, speech reading, and auditory training. Multicultural issues will be included. Also offered for undergraduate-level credit as SpHr 489 and may be taken only once for credit. Recommended prerequisite: SpHr 488/588.

SpHr 590 - Audiological Rehabilitation Clinic (2)
Supervised clinical practicum in the diagnosis and rehabilitation of children and adults with hearing disabilities; staff seminars in case dispositions. Maximum: 18 credits. Recommended prerequisite: SpHr 489/589, 498/598.

SSc - Social Science: General

SSc 299 - Special Studies (1-6)
(Credit to be arranged.)

SSc 601 - Research (1-9)
(Credit to be arranged.)

SSc 602 - Independent Study (1-9)
(Credit to be arranged.)

SSc 603 - Thesis (1 - 9)
(Credit to be arranged.)

SSc 604 - Cooperative Education/Internship (1-9)
(Credit to be arranged.)

SSc 605 - Reading and Conference (1-9)
(Credit to be arranged.)

SSc 606 - Special Problems/Projects (1-9)
(Credit to be arranged.)

SSc 607 - Seminar (1-9)
(Credit to be arranged.)

SSc 608 - Workshop (1-9)
(Credit to be arranged.)

SSc 609 - Practicum (1-9)
(Credit to be arranged.)

SSc 610 - Selected Topics (1-9)
(Credit to be arranged.)

Stat - Statistics

Stat 105 - Elementary Data Analysis (4)
A basic course in statistical analysis including presentation of data probability, probability distributions, sampling distributions, estimation, tests of significance, experimental design and analysis of variance, regression and correlation, nonparametric statistics, selected topics, applications, and use of statistical computer packages. A broad nontechnical survey designed primarily for non-math students who need to utilize the subject in their own fields. Not approved for major credit. This is the first course in a sequence of two: Stat 243 and Stat 244 which must be taken in sequence.

Stat 243R - Recitation for Stat 243 (0)
Recitation for Stat 243.
Corequisite: Stat 243.

Stat 244 - Introduction to Probability and Statistics II (4)
A basic course in statistical analysis including presentation of data probability, probability distributions, sampling distributions, estimation, tests of significance, experimental design and analysis of variance, regression and correlation, nonparametric statistics, selected topics, applications, and use of statistical computer packages. A broad nontechnical survey designed primarily for non-math students who need to utilize the subject in their own fields. Not approved for major credit. This is the second course in a sequence of two: Stat 243 and Stat 244 which must be taken in sequence.

Stat 244R - Recitation for Stat 244 (0)
Recitation for Stat 244.
Corequisite: Stat 244.

Stat 299 - Special Studies (1-4)
(Credit to be arranged.)
Stat 351 - Probability and Statistics for Electrical and Computer Engineering (4)

An introduction to applied probability, statistics, and data analysis. Sample spaces, probability laws, discrete and continuous probability models, sampling theory, point and interval estimation, hypothesis testing, regression, correlation, experimental design, analysis of variance, computer simulation and computation in Matlab. Applications to problems of current interest to electrical and computer engineers.

Prerequisite: Mth 252.

Stat 353 - Exploratory Data Analysis and Statistics for Mechanical and Materials Engineering (4)

A statistics course with the main emphasis on understanding data from mechanical engineering applications. Computer-based methods and the R software are used extensively. Descriptive statistics, probability and Bayes’ Rule are introduced. Formal inference and hypothesis testing are presented with methods of regression and analysis of variance.

Prerequisite: Mth 252.

Stat 366 - Introduction to Experimental Design (4)

Nonparametric statistics, multiple regression, topics in experimental design analysis of variance, factorial designs, analysis of covariance, other designs.

Prerequisite: Stat 244.

Stat 399 - Special Studies (1-6)

(Credit to be arranged.)

Stat 401 - Research (1-6)

(Credit to be arranged.) Consent of instructor.

Stat 404 - Cooperative Education/Internship (1-12)

(Credit to be arranged.)

Stat 405 - Reading and Conference (1-8)

(Credit to be arranged.) Consent of instructor.

Stat 407 - Seminar (1-4)

(Credit to be arranged.) Consent of instructor.

Stat 410 - Selected Topics (1-8)

(Credit to be arranged.) Consent of instructor.

Stat 451 - Applied Statistics for Engineers and Scientists I (4)

Sample spaces, probability, counting measures, discrete and continuous probability models, sampling theory, and computer applications. Also offered for graduate-level credit as Stat 551 and may be taken only once for credit. This is the first course in a sequence of two: Stat 451 and Stat 452 and must be taken in sequence.

Prerequisite: Mth 252.

Stat 452 - Applied Statistics for Engineers and Scientists II (3)

Point and interval estimation, hypothesis testing, regression, correlation, experimental design, analysis of variance, multivariable experiments, nonparametrics, statistical quality control, and computer applications. Also offered for graduate-level credit as Stat 552 and may be taken only once for credit. This is the second course in a sequence of two: Stat 451 and Stat 452 and must be taken in sequence.

Prerequisite: Mth 252.

Stat 461 - Introduction to Mathematical Statistics I (3)

Theory of probability, distributions of random variables, central limit theorem, sampling distributions, point and interval estimation, tests of hypotheses, analysis of variance. This is the first course in a sequence of three: Stat 461, Stat 462, and Stat 463 which must be taken in sequence.

Prerequisite: Mth 256.

Stat 462 - Introduction to Mathematical Statistics II (3)

Theory of probability, distributions of random variables, central limit theorem, sampling distributions, point and interval estimation, tests of hypotheses, analysis of variance. This is the second course in a sequence of three: Stat 461, Stat 462, and Stat 463 which must be taken in sequence.

Prerequisite: Mth 256.

Stat 463 - Introduction to Mathematical Statistics III (3)

Theory of probability, distributions of random variables, central limit theorem, sampling distributions, point and interval estimation, tests of hypotheses, analysis of variance. This is the third course in a sequence of three: Stat 461, Stat 462, and Stat 463 which must be taken in sequence.

Prerequisite: Mth 256.

Stat 464 - Applied Regression Analysis (3)

Basic concepts of regression analysis, matrix approach to linear regression selecting the “best” regression equation, and multiple regression. Computational algorithms and computer software regression packages. Applications in science, engineering, and business. Also offered for graduate-level credit as Stat 564 and may be taken only once for credit.

Prerequisite: Mth 261 and either Stat 451/551 or Stat 461/561.

Stat 465 - Experimental Design: Theory and Methods (3)

A theoretical and applied treatment of experimental design; analysis of variance, fixed effect models, random effects models, checking model adequacy; block designs, Latin squares, related designs; incomplete designs; factorial designs, confounding two-level designs, split-plot designs; fractional factorial designs; nested designs; relation to regression analysis; analysis of covariance. All sections will illustrate real world applications with computer usage. This is the first course in a sequence of two: Stat 465 and Stat 466. Also offered for graduate-level credit as Stat 565 and may be taken only once for credit.

Prerequisite: Stat 464/564.

Stat 466 - Experimental Design: Theory and Methods (3)

A theoretical and applied treatment of experimental design; analysis of variance, fixed effect models, random effects models, checking model adequacy; block designs, Latin squares, related designs; incomplete designs; factorial designs, confounding two-level designs, split-plot designs; fractional factorial designs; nested designs; relation to regression analysis; analysis of covariance. All sections will illustrate real world applications with computer usage. This is the second course in a sequence of two: Stat 465 and Stat 466. Also offered for graduate-level credit as Stat 566 and may be taken only once for credit.
Stat 467 - Applied Probability I (3)
Basic concepts of probability, conditional probability, conditional expectation, discrete-time Markov chains, branching processes, Poisson processes, continuous-time Markov chains, birth and death processes, queues and inventory, renewal processes. This is the first course in a sequence of two: Stat 467 and Stat 468 which must be taken in sequence. Also offered for graduate-level credit as Stat 567 and may be taken only once for credit.
Prerequisite: Stat 461/561 or Stat 451/551.

Stat 468 - Applied Probability II (3)
Basic concepts of probability, conditional probability, conditional expectation, discrete-time Markov chains, branching processes, Poisson processes, continuous-time Markov chains, birth and death processes, queues and inventory, renewal processes. This is the second course in a sequence of two: Stat 467 and Stat 468 which must be taken in sequence. Also offered for graduate-level credit as Stat 568 and may be taken only once for credit.
Prerequisite: Stat 461/561 or Stat 451/551.

Stat 470 - Statistical Consulting (1-3)
Introduction to techniques and methods of statistical consulting. Faculty supervised consulting sessions with clients on appropriate projects brought to the Statistics Consulting Laboratory. Data and/or statistical problems, from within and outside the University, are provided by clients and interdisciplinary guest lecturers. Introduction to and proficiency with various statistical computing packages as data analytic tools. A community-based learning course. Also offered for graduate-level credit as Stat 570 and may be taken only once for credit.

Stat 501 - Reading and Conference (1-12)
(Credit to be arranged.) Consent of instructor.

Stat 504 - Cooperative Education/Internship (1-12)
(Credit to be arranged.)

Stat 505 - Reading and Conference (1-12)
(Credit to be arranged.) Consent of instructor.

Stat 507 - Seminar (1-4)
(Credit to be arranged.) Consent of instructor.

Stat 510 - Selected Topics (1-8)
(Credit to be arranged.) Consent of instructor.

Stat 543 - Survey of Statistical Methods (4)
An introductory, discipline-neutral course in statistical analysis to prepare graduate students for research methods courses in other departments. Topics include descriptive statistics, confidence intervals, hypothesis tests, regression and correlation, analysis of variance, chisquared tests, and use of statistical software.

Stat 551 - Applied Statistics for Engineers and Scientists I (4)
Sample spaces, probability, counting measures, discrete and continuous probability models, sampling theory, and computer applications. Also offered for undergraduate-level credit as Stat 451 and may be taken only once for credit. This is the first course in a sequence of two: Stat 551 and Stat 552 and must be taken in sequence.
Prerequisite: Stat 461/561 or Stat 451/551.

Stat 552 - Applied Statistics for Engineers and Scientists II (3)
Point and interval estimation, hypothesis testing, regression, correlation, experimental design, analysis of variance, multivariable experiments, nonparametrics, statistical quality control, and computer applications. Also offered for undergraduate-level credit as Stat 452 and may be taken only once for credit. This is the second course in a sequence of two: Stat 551 and Stat 552 and must be taken in sequence.

Stat 561 - Mathematical Statistics I (3)
Taught at a higher level than Stat 461, 462, 463. Provides a solid foundation in the theory and methods of statistical inference. Topics include conditional distributions, functions of random variables, sampling distributions, order statistics, convergence in distribution and convergence in probability, central limit theorems, sufficiency, point estimation, confidence intervals, and testing of statistical hypotheses, most powerful tests, likelihood ratio tests, categorical data analysis, regression, nonparametric methods, and Bayesian inference. This is the first course in a sequence of three: Stat 561, Stat 562, and Stat 563.
Prerequisite: Stat 462 or equivalent.

Stat 562 - Mathematical Statistics II (3)
Taught at a higher level than Stat 461, 462, 463. Provides a solid foundation in the theory and methods of statistical inference. Topics include conditional distributions, functions of random variables, sampling distributions, order statistics, convergence in distribution and convergence in probability, central limit theorems, sufficiency, point estimation, confidence intervals, and testing of statistical hypotheses, most powerful tests, likelihood ratio tests, categorical data analysis, regression, nonparametric methods, and Bayesian inference. This is the second course in a sequence of three: Stat 561, Stat 562, and Stat 563.
Prerequisite: Stat 462 or equivalent.

Stat 563 - Mathematical Statistics III (3)
Taught at a higher level than Stat 461, 462, 463. Provides a solid foundation in the theory and methods of statistical inference. Topics include conditional distributions, functions of random variables, sampling distributions, order statistics, convergence in distribution and convergence in probability, central limit theorems, sufficiency, point estimation, confidence intervals, and testing of statistical hypotheses, most powerful tests, likelihood ratio tests, categorical data analysis, regression, nonparametric methods, and Bayesian inference. This is the third course in a sequence of three: Stat 561, Stat 562, and Stat 563.
Prerequisite: Stat 462 or equivalent.

Stat 564 - Applied Regression Analysis (3)
Basic concepts of regression analysis, matrix approach to linear regression selecting the "best" regression equation, and multiple regression. Computational algorithms and computer software regression packages. Applications in science, engineering, and business. Also offered for undergraduate-level credit as Stat 464 and may be taken only once for credit.
Prerequisite: Mth 261 and either Stat 451/551 or Stat 461/561.
Stat 565 - Experimental Design: Theory and Methods (3)

A theoretical and applied treatment of experimental design; analysis of variance, fixed effect models, random effects models, checking model adequacy; block designs, Latin squares, related designs; incomplete designs; factorial designs, confounding two-level designs, split-plot designs; fractional factorial designs; nested designs; relation to regression analysis; analysis of covariance. All sections will illustrate real world applications with computer usage. This is the first course in a sequence of two: Stat 565 and Stat 566. Also offered for undergraduate-level credit as Stat 465 and may be taken only once for credit.

Prerequisite: Stat 464/564.

Stat 566 - Experimental Design: Theory and Methods (3)

A theoretical and applied treatment of experimental design; analysis of variance, fixed effect models, random effects models, checking model adequacy; block designs, Latin squares, related designs; incomplete designs; factorial designs, confounding two-level designs, split-plot designs; fractional factorial designs; nested designs; relation to regression analysis; analysis of covariance. All sections will illustrate real world applications with computer usage. This is the second course in a sequence of two: Stat 565 and Stat 566. Also offered for undergraduate-level credit as Stat 465 and may be taken only once for credit.

Prerequisite: Stat 464/564.

Stat 567 - Applied Probability I (3)

Basic concepts of probability, conditional probability, conditional expectation, discrete-time Markov chains, branching processes, Poisson processes, continuous-time Markov chains, birth and death processes, queues and inventory, renewal processes. This is the first course in a sequence of two: Stat 567 and Stat 568 which must be taken in sequence. Also offered for undergraduate-level credit as Stat 468 and may be taken only once for credit.

Prerequisite: Stat 461/561 or Stat 451/551.

Stat 570 - Statistical Consulting (1-3)

Introduction to techniques and methods of statistical consulting. Faculty supervised consulting sessions with clients on appropriate projects brought to the Statistics Consulting Laboratory. Data and/or statistical problems, from within and outside the University, are provided by clients and interdisciplinary guest lecturers.

Introduction to and proficiency with various statistical computing packages as data analytic tools. A community-based learning course. Also offered for undergraduate-level credit as Stat 470 and may be taken only once for credit.

Stat 571 - Applied Multivariate Statistical Analysis (3)

Introduction to techniques and methods of multivariate statistical analysis. Deals with vector-valued data generated on individual experimental units. Applies the methods of vector analysis and matrix algebra to statistical problems of estimation and hypothesis testing, based primarily on the multivariate normal distribution. Computing to be an integral part of the course. Calculations will be done using a software package such as SAS or SPSS. Recommended prerequisites: Stat 244, Mth 254, and Mth 261.

Stat 572 - Bayesian Statistics (3)

Modern applied Bayesian methods including Markov Chain Monte Carlo methods for analyzing multivariate posterior distributions. Computing will be done primarily in R using standard libraries for sampling.

Prerequisite: Stat 461 or Stat 561.

Stat 573 - Computer Intensive Methods in Statistics (3)

Resampling methods in statistics using empirical data, programming with statistical software, review materials (sampling distributions, hypothesis testing, confidence interval construction, and design of experiments), resampling version of review materials, and applications. Recommended prerequisites: Stat 452/552 or 466/566.

Stat 574 - Sampling Theory and Methods (3)

Introduction to the theory and methodology of random sampling. Includes stratified, cluster, systematic, and multi-stage sampling. Applications include sampling design and analysis, as well as sample weighting and sampling with unequal probabilities. Recommended prerequisite: Stat 451/551

Stat 577 - Categorical Data Analysis (4)

Topics include cross-tabulation statistics for matched samples, and methods to assess confounding and interaction via stratified tables. Students explore logistic regression in some detail, and relate results back to those found with stratified analyses. Topics for logistic regression will include: parameter interpretation, statistical adjustment, variable selection techniques, and model fit assessment. Statistical software is used.

Recommended prerequisite: Stat 452/552.

Stat 578 - Survival Analysis (3)

Time-to-event data subject to random and/or deliberate censoring. Specialized models and procedures that accommodate censoring are presented. Parametric models and methods, including accelerated failure time models, the Kaplan-Meier estimate of survival, Cox proportionate hazards model, the extended Cox model, and frailty models. Software package such as S-PLUS is used.

Recommended prerequisite: Stat 452/552.

Stat 580 - Nonparametric Methods (3)

Focus on standard nonparametric methods useful for the analysis of experimental data with minimal model assumptions. Topics include one and two-sample problems, one and two-way analysis of variance, multiple comparisons, rank correlation, estimation and confidence intervals, theory of U-statistics, permutation tests, Bootstrap, Monte Carlo power simulation studies.

Prerequisite: Stat 462 or Stat 452/552.

Stat 601 - Research (1-9)

(Credit to be arranged.)
Stat 604 - Cooperative Education/Internship (1-12)
(Credit to be arranged.)

Stat 605 - Reading and Conference (1-8)
(Credit to be arranged.)

Stat 607 - Seminar (1-4)
(Credit to be arranged.)

Stat 610 - Selected Topics (0-4)
(Credit to be arranged.)

Stat 661 - Advanced Mathematical Statistics I (3)

Stat 662 - Advanced Mathematical Statistics II (3)

Stat 663 - Advanced Mathematical Statistics III (3)

Stat 664 - Theory of Linear Models I (3)
Multivariate normal distribution; moments and characteristic functions; noncentral Chi-square and noncentral F distributions; distribution of quadratic forms; estimation and distribution of estimators; principles of maximum likelihood and least squares; confidence regions and tests of hypotheses; regression models; Wishart distribution; Hotelling’s T2 statistic. This is the first course in a sequence of three: Stat 664, Stat 665, and Stat 666 which must be taken in sequence. Recommended prerequisite: Stat 563.

Stat 665 - Theory of Linear Models II (3)
Multivariate normal distribution; moments and characteristic functions; noncentral Chi-square and noncentral F distributions; distribution of quadratic forms; estimation and distribution of estimators; principles of maximum likelihood and least squares; confidence regions and tests of hypotheses; regression models; Wishart distribution; Hotelling’s T2 statistic. This is the second course in a sequence of three: Stat 664, Stat 665, and Stat 666 which must be taken in sequence. Recommended prerequisite: Stat 563.

Stat 666 - Theory of Linear Models III (3)
Multivariate normal distribution; moments and characteristic functions; noncentral Chi-square and noncentral F distributions; distribution of quadratic forms; estimation and distribution of estimators; principles of maximum likelihood and least squares; confidence regions and tests of hypotheses; regression models; Wishart distribution; Hotelling’s T2 statistic. This is the third course in a sequence of three: Stat 664, Stat 665, and Stat 666 which must be taken in sequence. Recommended prerequisite: Stat 563.

Swah - Swahili

Swah 101 - First Year Swahili (4)
Introduction to elementary Swahili. Emphasis on listening comprehension, and oral practice, the elements of grammar, vocabulary building, and elementary readings. This is the first course in a sequence of three: Swah 101, Swah 102, and Swah 103.

Swah 102 - First Year Swahili (4)
Introduction to elementary Swahili. Emphasis on listening comprehension, and oral practice, the elements of grammar, vocabulary building, and elementary readings. This is the second course in a sequence of three: Swah 101, Swah 102, and Swah 103.

Swah 103 - First Year Swahili (4)
Introduction to elementary Swahili. Emphasis on listening comprehension, and oral practice, the elements of grammar, vocabulary building, and elementary readings. This is the third course in a sequence of three: Swah 101, Swah 102, and Swah 103.
modernity, and biographies. Conducted in English.

Swah 399 - Special Studies (1-6)
(Credit to be arranged.)

Swed - Swedish

Swed 101 - First-year Swedish (4)
Beginning Swedish. Emphasis on communication skills: listening, speaking, reading, writing. This is the first course in a sequence of three: Swed 101, Swed 102, and Swed 103.

Swed 102 - First-year Swedish (4)
Beginning Swedish. Emphasis on communication skills: listening, speaking, reading, writing. This is the second course in a sequence of three: Swed 101, Swed 102, and Swed 103.

Swed 103 - First-year Swedish (4)
Beginning Swedish. Emphasis on communication skills: listening, speaking, reading, writing. This is the third course in a sequence of three: Swed 101, Swed 102, and Swed 103.

Swed 199 - Special Studies (1-5)
(Credit to be arranged.)

Swed 201 - Second-year Swedish (4)
Intensive review of basics introduced in first-year courses and further development of communication skills. This is the first course in a sequence of three: Swed 201, Swed 202, and Swed 203. Recommended prerequisite: Swed 103.

Swed 202 - Second-year Swedish (4)
Intensive review of basics introduced in first-year courses and further development of communication skills. This is the second course in a sequence of three: Swed 201, Swed 202, and Swed 203. Recommended prerequisite: Swed 103.

Swed 203 - Second-year Swedish (4)
Intensive review of basics introduced in first-year courses and further development of communication skills. This is the third course in a sequence of three: Swed 201, Swed 202, and Swed 203. Recommended prerequisite: Swed 103.

Swed 299 - Special Studies (1-5)
(Credit to be arranged.)

SW - Social Work

SW 301 - Introduction to Social Work (4)
This course introduces the student to the profession of social work and the field of social welfare through a historical lens. This course provides the student with the foundational language, principles of social work and introduces the student to the BSW Program. It will include introduction and overview of the knowledge, values, and skills of becoming a professional generalist social worker.

SW 301U - Introduction to Social Work (4)
This course introduces the student to the profession of social work and the field of social welfare through a historical lens. This course provides the student with the foundational language, principles of social work and introduces the student to the BSW Program. It will include introduction and overview of the knowledge, values, and skills of becoming a professional generalist social worker.

SW 320 - Introduction to Child Welfare (4)
An overview of the child welfare systems. Introduction to the identification, treatment of child abuse and neglect. Present historical and current development of child welfare systems in the United States, discussion of the key practice considerations human service professionals working with maltreated children and their families address.

SW 320U - Introduction to Child Welfare (4)
An overview of the child welfare systems. Introduction to the identification, treatment of child abuse and neglect. Present historical and current development of child welfare systems in the United States, discussion of the key practice considerations human service professionals working with maltreated children and their families address.

SW 339 - Introduction to Oppression and Privilege (3)
Introduction and exploration of diversity, oppression and privilege frameworks; intersectionality regarding the dynamics of race, ethnicity, gender, sexual orientation, religion, (dis)ability status, and class. The course will focus on theory, knowledge, values, and beginning skills to work with individuals in the area of social justice and social work. The course will have relevant knowledge, values, and skills pertaining to acquiring the BASW.

Prerequisite: Admission to major.

SW 340 - Advocacy for Policy Change (4)
Current structures and history of social welfare policies and services will be examined, and students will be engaged in policy practice to advance social and economic well-being of families, groups and communities.

Prerequisite: Admission to major, junior standing, SW 339.

SW 341 - Social Justice Practice (3)
Engages in generalist social work policy practice to advance social and economic well-being and to deliver effective social work services through the lens of social justice.

Prerequisite: admission to major; junior standing; SW 339, SW 340, SW 350.

SW 350 - Human Behavior Through the Lifespan (4)
Theoretical and conceptual foundations of working with individuals and families throughout the lifespan in professional and community settings. Historical and socio-political issues will be integrated with theory to prepare beginning generalist social workers for effective practice in a variety of contexts.

Prerequisite: Admission to the major, junior standing, SW 339.

SW 351 - Beginning Generalist Practice (3)
Based on generalist social work practice principles, this course prepares students to begin practice with individuals, families, groups, communities, and organizations. The course focuses on helping students to develop beginning engagement skills with particular attention to social work values and ethics, self reflection, and the development of a professional self. Successful completion of this course is required for students to enter a field placement (SW 400).

Prerequisite: SW 339, SW 340, SW 350.

SW 399 - Special Studies (4)
(Credit to be arranged.)
**SW 399U - Special Studies (4)**
(Credit to be arranged.)

**SW 400 - Field Placement and Seminar I-III (4)**
This course is the 9-month agency-based field practicum and concurrent field seminar where students apply generalist social work knowledge, values, and develop generalist social work skills. The supervised field practicum and weekly field seminar facilitate students' application of social work practice skills, the integration of theoretical content and the development of critical thinking skills. This course is a core component of the BSW curriculum, allowing students to apply knowledge gained in their social work courses in real world practice settings. Corequisite: SW 430, 431 and 432.

**SW 402 - Independent Study (1-12)**
(Credit to be arranged.)

**SW 404 - Intenship (1-8)**
Contact the department for a description for this course.

**SW 405 - Reading and Conference (1-6)**
(Credit to be arranged.) Consent of instructor.

**SW 407 - Seminar (1-6)**
(Credit to be arranged.) Consent of instructor.

**SW 409 - Practicum (1-12)**
(Credit to be arranged.)

**SW 410 - Selected Topics (1-6)**
(Credit to be arranged.)

**SW 410U - Selected Topics (4)**
(Credit to be arranged.)

**SW 430 - Generalist Practice with Communities and Organizations (3)**
The purpose of this course is to prepare students to intentionally and effectively work with organizations and communities. Skills will be developed in the context of social work values and ethics, with special attention to social and economic justice.
Prerequisite: Admission to major and SW 351. Corequisite: SW 400.

**SW 431 - Generalist Practice with Individuals and Families (3)**
Based on generalist social work practice principles, this course prepares students for practice with individuals and families. The course focuses on helping students to develop assessment and intervention skills for working with individual and families. Students will learn how to gather the information that is necessary for a holistic assessment, how to work collaboratively with service users in defining goals, and how to select and facilitate appropriate interventions.
Prerequisite: SW 351, SW 430. Corequisite: SW 400.

**SW 432 - Generalist Practice with Groups (3)**
Based on generalist social work practice principles, this course prepares students for practice with groups. The course focuses on helping students to develop assessment and intervention skills for working with client, organizational and community groups. Students will learn how to develop a group proposal, facilitate a group, and assess group dynamics.
Prerequisite: SW 431. Corequisite: SW 400.

**SW 441 - Psychobiology for Social Workers (3)**
Provides baccalaureate level social workers with a basic understanding of biological concepts, physiological systems, and neurological-environmental interactions. Enhances social work practice skills by providing a holistic conceptualization of people-in-environment.
Prerequisite: Admission to major.

**SW 447 - Social Work and Sustainability (3)**
Examines the role of professional social work in achieving sustainability at individual, community, regional, national, and global levels. Using a multidisciplinary perspective, the environmental, economic, and social aspects of sustainability, considered theoretically and practically. Sustainability linked to attainment of environmental, economic, and social justice. Includes community-based learning projects addressing sustainability.
Prerequisite: SW 440 (BSW program) or SW 541 (graduate) or their equivalent.

**SW 450 - Social Work Research and Evaluation I (3)**
The importance of social work research and evaluation for practice and policy. Qualitative and quantitative research, critical consumption of research, and conducting evaluations. Focuses on research that promotes social and economic justice and that encourages respect for diversity. Includes experimental designs, single system designs, focus groups, and interviews. Covers early phases of the research process: conceptualization, design, sampling, measurement, and data collection. Emphasizes ethical issues.
Prerequisite: Admission to major; SW 351.

**SW 451 - Social Work Research and Evaluation II (3)**
Teaches next phases of the research and evaluation process: data analysis, formulation of implications of findings, and dissemination. Critical consumption of research findings as well as conducting data analysis. Qualitative and quantitative data analysis, including descriptive statistics, hypothesis testing, data analysis of single system designs, and thematic analysis. Focuses on research and evaluation that promote social and economic justice and that encourage respect for diversity. Emphasizes ethical issues.
Prerequisite: Admission to major; SW 450.

**SW 460 - Senior Integrative Portfolio (3)**
This course facilitates students' integration of past learning, both formal and informal, into a generalist social work practice framework. The interrelated nature of HBSE, social welfare policy, practice, field, and research is emphasized. Students create an integrated competency-based (10 competencies) portfolio documenting their personal and professional achievements throughout the social work program. This course provides the opportunity to synthesize and apply holistically the components (knowledge, values, and skills) of a competent generalist social worker preparing for entry-level professional social work career. Co-requisite: SW 432.
Corequisite: SW 432.

Introduction to Indian child welfare with an emphasis on understanding legal, historical, and cultural issues applying to work with American Indian and Alaskan native youth. Emphasis is on Indian child welfare issues in the Pacific Northwest.

SW 501 - Research (1-9)
(Credit to be arranged.)

SW 502 - Laboratory (1-9)
(Credit to be arranged.)

SW 503 - Thesis I, II III (1-9)
(Credit to be arranged.)

SW 504 - Cooperative Education/Internship (0-15)
(Credit to be arranged.)

SW 505 - Reading and Conference (1-6)
(Credit to be arranged.)

SW 506 - Special Problems (1-6)
(Credit to be arranged.)

SW 507 - Seminar (1-6)
(Credit to be arranged.)

SW 508 - Workshop (1-6)
(Credit to be arranged.)

SW 510 - Selected Topics (1-6)
(Credit to be arranged.)

SW 511 - Foundation Field Placement and Seminar (1-4)

Nine month agency-based 500 hour field practicum with a concurrent field seminar. Supervised field practicum and weekly field seminar to integrate theory and critical thinking. Apply foundation social work knowledge and skills in real world practice settings. Core component of MSW curriculum. Required three times in foundation year.

SW 512 - Advanced Field Placement (1-4)

Nine month agency-based 500 hour field practicum. Supervised field practicum to integrate advanced theory and skill building. Core component of MSW curriculum. Required three times in advanced year.

SW 514 - Cultural and Spanish Language Immersion for Social Workers Costa Rica (3)

Course includes culture and language classes with visits to social service agencies in Costa Rica. Course will prepare students to offer social work services in multicultural, multilingual settings through the context of social work values and ethics and with special attention to anti-oppressive and non-discriminatory practice with diverse populations.

SW 515 - Skills for the Helping Process - Groups (3)

Help students to develop assessment and intervention skills across multiple levels. Assess types and stages of groups, roles, and group dynamics. Develop a group proposal. Learn how to begin, facilitate, and end a group with clients, organizations, and communities.

SW 516 - Motivational Interviewing (3)

Teaches the central theoretical and empirical tenets of Motivational Interviewing (MI), as well as the clinical skills necessary to deliver the intervention to a wide range of clients in diverse settings. Students will learn and practice both the spirit and techniques of motivational interviewing.

SW 517 - Health Across the Lifespan I (3)

Prerequisite: SW 516. Corequisite: SW 512.

SW 518 - Health Across the Lifespan II (3)

Prerequisite: SW 518. Corequisite: SW 512.

SW 519 - Health Across the Lifespan III (3)

Advanced concentration course for students in health related settings. Peer consultation, ethics committees, social determinants of health, group work, surrogate decision making, harm reduction models, assessment tools, intervention and evaluation of practice, NASW Practice Standards, basic pharmacology, policy related to systems of care.

Prerequisite: SW 518. Corequisite: SW 512.

SW 520 - Social Welfare History and Policy (3)

Addresses the policy making of social welfare and explores values and ethical choices affecting the process. Examines historical and contemporary issues and their impact on the social work profession and social welfare. Highlights relations among social problems, social policies, and social practices as means for promoting social justice.

SW 521 - Advanced Anti-Oppressive Practice (3)

This course builds student capacity for anti-oppressive practice in the micro and mezzo practice arenas, with an emphasis on the micro levels of intervention. The focus is on the positional privilege of social worker and the oppression experiences of service users (clients) and communities.

Prerequisite: SW 539 and SW 532, or SW 589.

SW 522 - Health Care Policies and Programs (3)

Advanced policy course analyzes the history of selected health care policies, programs, and disease categories within the context of social work practice in health care. Contemporary outcomes in current health and service delivery systems presented from a policy perspective. Develops skills for policy change.

SW 524 - Community Organization (3)

Presents community organizing as a well-established social work method for promoting social change and improving community life through community and institutional reform. Topics for class will include an overview of the history of community organizing, models of community change (locality development,
social planning and social action), methods of social change (advocacy, mobilizing, organizing, coalition building, and partnership), examples of community-based organization, leadership development, and measuring the benefit to communities. Discussion also includes understanding the role of power and culture that exists within neighborhoods and communities.

Prerequisite: SW 520 or SW 589 (Advanced standing only).

**SW 525 - Poverty: Policies and Programs (3)**

Examines the nature and causes of poverty and inequality in the United States and the impact of economic globalization on social work’s response to these critical social problems. Studies ways in which people in poverty cope and support each other in low-income urban neighborhoods; examines the ways in which work and welfare interact with each other and with informal social supports. Addresses policy issues, including those involved in both service and income strategies to relieve or prevent poverty; develops skills for effective practice with low-income communities, families, and individuals. Also offered as SW 625 and may be taken only once for credit.

Prerequisite: SW 520 or SW 589 (Advanced standing only).

**SW 526 - Applied Ethics and Law in Social Work Practice (3)**

Apply ethical theory, law, policy, and codes to actual social work practice cases and situations. Consider the role of individual free will, and strategies to address the influence of personal values and biases. Explore the interpretation and application of Oregon statutes to social work practice.

**SW 528 - Facilitation of Multi-disciplinary/Care Coordination Team Meetings (3)**

 Addresses the theoretical foundations, applications and facilitation skills required for collaborative participatory decision-making in the context of social work practice across populations. Develop framework for facilitating in-depth strengths, needs assessment and problem solving. Gain understanding and skills in balancing power dynamics, clinical perspectives, and timely decision-making within agency parameters.

**SW 529 - International Mental Health Policy (3)**

Compares mental health policies from a global perspective, emphasizing United Nations and World Health Organization perspectives. Programs and policies from various countries are compared and contrasted with those of the U.S., and Oregon in particular. Also offered as SW 629 and may be taken only once for credit.

Prerequisite: SW 520 or SW 589 (Advanced standing only).

**SW 530 - Skills for the Helping Process – Individuals and Families (3)**

Focuses on helping to develop engagement, assessment, and intervention skills for work with individuals and families. Will complete a biopsychosocial assessment, learn how to work collaboratively with service users to define goals, and how to select and facilitate relevant interventions.

Prerequisite: SW 540 or concurrent enrollment.

**SW 532 - Advocacy and Empowerment (3)**

Builds the advocacy skills to form purposive and equitable partnerships with service users, their communities, and organizations. Includes empowerment-based practices in micro, mezzo and macro work. Healthy critique of the role of the professional social worker as “expert” is examined.

**SW 533 - Clinical Social Work Practice I (3)**

This is a three term clinical concentration course that provides advanced theory-based practice from multiple theoretical perspectives. Special attention will be paid to relational self-awareness, cultural responsiveness, ethics, evidenced-based principles and intervention with individuals, families, and groups. This is the first course in a sequence of three: SW 533, SW 534, SW 535 and must be taken in sequence. Corequisite: SW 512.

Prerequisite: SW 511 or SW 589 (Advanced standing only). Corequisite: SW 512.

**SW 534 - Clinical Social Work Practice II (3)**

The second in a three-course sequence, course addresses the family of origin perspective on family systems theory. Students deepen self-awareness related to their diversity and positionality in providing clinical services. Understanding and managing one’s reactivity in clinical interactions is a focus. Other theories are integrated. This is the second course in a sequence of three: SW 533, SW 534, SW 535 and must be taken in sequence.

Prerequisite: SW 533. Corequisite: SW 512.

**SW 535 - Clinical Social Work Practice III (3)**

This course integrates knowledge from previous courses and field practicum. Students are provided an opportunity to develop and articulate their personal theoretical orientation or practice model, an essential step in beginning a career as a professional clinical social worker. Professional issues and licensing will be addressed. This is the third course in a sequence of three: SW 533, SW 534, SW 535 and must be taken in sequence.

Prerequisite: SW 534. Corequisite: SW 512.

**SW 539 - Diversity and Social Justice (3)**

Social justice and oppression based on race, ethnicity, gender, sexual orientation, religion, (dis)ability, and social class explored. Will examine social, political, and cultural processes as they affect intergroup and intra-group relations. Explores the role of the social worker as border crosser, cultural learner, and agent of change.

**SW 540 - Human Development Through the Lifespan (3)**

Presents and critiques basic knowledge of human development from conception to late adulthood. Provides skills to organize information about human dynamics using developmental frameworks, while still stressing the multi-causal and bi-directional nature of behavioral outcomes.

**SW 541 - Societal, Community and Organizational Structures and Processes (3)**

Service users and social work practitioners are constrained by societal, community, and organizational structures and processes. Social construction of conceptual frames with social work values and ethics are critiqued. Theories addressing the behavior and change in process of communities and organizations are applied and evaluated.

**SW 542 - Social Work in Native American Communities (3)**

Introduces and expands social work knowledge and methods appropriate for working with tribal and urban Indian
communities. The historical, social and cultural contexts of social work practice with individuals, families, groups, and communities in Indian Country will be examined.

SW 543 - The African American Family: Multigenerational Trauma and Issues of Violence (3)

Exposes students to historical events and policies which have led to contemporary social problems and structural inequalities that continue to negatively impact African Americans. Will provide practical tools to inform practice at the five levels of service and empower individuals, families, groups, organizations and communities throughout the change process.

SW 544 - Mid-Life and Beyond (3)

Focuses on development in mid and late adulthood from a lifespan perspective. Promotes appreciation of the developmental potential for normal and healthy aging. Explores demographic, socio-historical and developmental characteristics of currently emerging older adults. Focuses on current developmental theories in social cognition and identity development in mid and late adulthood.

SW 545 - Advanced Human Behavior in the Social Environment (3)

Provides an opportunity for students to explore current theoretical developments in the social and behavioral sciences which apply to social work practice including populations at risk. Taught in different sections each of which covers social and cultural contexts for human behavior in the social environment. May be repeated for additional credit. Also offered as SW 544.

Prerequisite: SW 540, SW 541 or SW 589 (Advanced standing only).

SW 547 - Social Work and Sustainability (3)

Examines the role of professional social work in achieving sustainability at individual, community, regional, national, and global levels. Using a multidisciplinary perspective, the environmental, economic, and social aspects of sustainability, considered theoretically and practically. Sustainability linked to attainment of environmental, economic, and social justice. Includes community-based learning projects addressing sustainability.

Prerequisite: SW 440 (BSW program) or SW 541 (graduate) or their equivalent.

SW 550 - Research and Evaluation I (3)

Introduction to research and evaluation in social work. Introduces critical consumption of research and ethics. Addresses qualitative and quantitative social work research, group designs, single system designs, and evaluation. Considers measurement, sampling, design, and data collection. Addresses social and economic justice, cultural sensitivity, inclusion, and diversity.

Prerequisite: SW 550.

SW 551 - Research and Evaluation II (3)

Focuses on techniques of quantitative data analysis and introduces methods of qualitative data analysis. Descriptive statistics, probability theory and hypothesis testing, and inferential methods. Addresses connections between (a) social work research and evaluation and (b) social and economic justice, cultural sensitivity, inclusion, and diversity.

Prerequisite: SW 550.

SW 555 - Social Work Perspectives on Mental Health Disorders (3)

Reviews and analyzes mental disorders from DSM-5 perspectives and variables that reshape and redefine concepts and definitions of mental health and illness. The development, use, influence, and limitations of DSM are considered from various contexts. Examines strategic approaches to assessment, diagnosis, and intervention from the recovery philosophy and SW perspectives.

Prerequisite: SW 530 or SW 589.

SW 558 - Abuse and Trauma: Theory and Intervention (3)

Examines the impact of trauma and abuse on adults, children, and families. Acute and long-term sequelae will be identified, emphasizing the interaction of traumatic and developmental effects. An integrative biopsychosocial intervention model for working with individuals, groups, and families will be explored through multiple theoretical lenses.

Prerequisite: SW 530 or SW 589.

SW 560 - Understanding and Working with LGBT Populations in Social Work (3)

Explore current theory of privilege and oppression that applies to sexual orientation/gender/gender identity/gender expression. Emphasis on combating oppression and discrimination in professional, personal, community, and social environments, and in developing affirming SW practices. Focus on students engaging in experiential learning that challenges their internalized and socially constructed beliefs.

SW 561 - Clinical Social Work with Groups (3)

Deals with the theory and practice of clinical social work within the wide range of groups in which social workers participate as workers and co-workers. Articulates issues related to group process and development as to their effect on the group experience. Includes leadership strategies and diverse populations.

Prerequisite: SW 515 or SW 589.

SW 562 - Social Work with Grief and Loss (3)

Examination of death at different stages of the life cycle. Review of theory and research about death and dying, loss, and grief resolution. Unique cultural and religious differences are emphasized. Examines social service assistance for persons, families and communities that face acute, chronic and terminal illnesses.

SW 563 - Social Work with Children, Adolescents, and Their Families (3)

Explores clinical social work practice with children, adolescents, and families. Emphasizes a collaborative and contextual approach that, in addition to child-focused interventions, includes work with parents, families, and groups in a variety of settings. Delineation and demonstration of specific clinical strategies and techniques with opportunities to practice and apply in field.

Prerequisite: SW 530 or SW 589.

SW 564 - Social Work in Schools (3)

Uses a policy/practice perspective to prepare students for effective and culturally sensitive social work practice in early childhood and K-12 education. Presents multiple roles of school social workers and educational policies that provide context for
SW 566 - Social Work Practice in Child Welfare (3)

Designed for students who are either considering a career or are interested in public child welfare. Explores selected areas of child welfare related to child maltreatment. Emphasis on the critical examination of empirically based case management intervention strategies and their appropriate use with children and their families.

SW 567 - Evidence Based Interventions for Community Mental Health Practice (3)

Reviews and critiques evidence-based interventions for community-based mental health populations. These interventions include supported employment, assertive community treatment/case management, psychosocial rehabilitation, psychopharmacology, recovery and consumer perspectives, and integrated treatment for co-occurring substance use disorders. Theoretical frameworks include harm reduction, transtheoretical/readiness to change, and health promotion.

Prerequisite: SW 532, SW 540 or SW 589 (Advanced standing only).

SW 568 - Community Mental Health Seminar (3)

Seminar on interdisciplinary relationships among social work, psychiatry, and nursing; and on a variety of clinical, and policy topics. For students in community mental health placements and those working with individuals with severe and persistent mental illness. Jointly offered with OHSU's Department of Public Psychiatry. Enrollment is limited to six students per term and requires instructor approval.

SW 569 - Social Work in End-of-Life and Palliative Care (3)

Covers a broad range of topics related to social work and end-of-life and palliative care. Addresses: cultural and spiritual dimensions at end-of-life, pain and symptom management, hospice, ethical considerations, practice and policy guidelines, team work, mental health at end-of-life, vulnerable populations and resources available to patients and families.

SW 571 - Substance Use, Abuse and Addiction and Social Work Practice (3)

Provide students with a foundation in direct and indirect practice issues with clients, families and communities challenged by substance abuse and addiction. Assist students in further developing and integrating their social work practice frameworks with deeper understanding and skill regarding the psychodynamic, biological and ecological nature of substance abuse disorders.

SW 574 - Social Work with Frail Older Adults (3)

Mental and physical frailties experienced by older adults are examined for their implications for adaptation and intervention. Mental disorders as they are uniquely characterized in late adulthood are reviewed, with special emphasis on age appropriate assessment. Psychosocial interventions for both community and institutionalized populations will include individual, family, group, and environmental approaches.

SW 575 - Multicultural Social Justice Work in Action (3)

Examine current perspectives on multicultural SW practices for individuals, families and groups marginalized due to race, ethnicity, economic status, sexual identity, and immigration. Develop strategies to provide holistic, empowering and culturally-responsive services based on assessment, engagement and intervention and the liberation health SW model.

Prerequisite: SW 539 and SW 530, or SW 589.

SW 579 - Working with Involuntary Clients (3)

Course examines legal, ethical and effective practice with involuntary clients, often members of oppressed groups. Will also address research regarding "involuntary practitioners," self-care, client advocacy, value conflicts, and reform efforts.

SW 585 - Fund Development and Grant Writing (3)

Deepening understanding of funding role and development in nonprofit industry. Application of fundraising strategies and grant writing to create or recreate innovative programs and marketing strategies. Develop program budgeting, accurate case statements and messages, draft grant applications and learn to create and sustain authentic long term fund development strategies.

SW 586 - Children, Youth and Families I (3)

Advanced concentration course for students working with children, youth, and families. Focus on ethics, self-reflection and identity, and social location, critical analysis, and multi-disciplinary system work. Theories and frameworks for multidimensional assessments are examined. This is the first course in a sequence of three: SW 586, SW 587, SW 588 and must be taken in sequence. Co-requisite: SW 512.

Prerequisite: SW 511 or SW 589. Corequisite: SW 512.

SW 587 - Children, Youth, and Families II (3)

Advanced concentration course for students interested in working with children, youth, and families. Student will continue to explore, learn, and apply methods for multi-systemic social work practice. Demonstration of practice methods and skills for working though barriers created by social policies that impact children, youth, and families will be addressed. This is the second course in a sequence of three: SW 586, SW 587, SW 588 and must be taken in sequence.

Prerequisite: SW 586. Corequisite: SW 512.

SW 588 - Children, youth, and families III (3)

Third advanced concentration course for students interested in working with children,
youth, and families. The course requires a deepening of practice skills. Students address secondary traumatization, burnout, and self-care. Also will examine impact of policy on service-users and promoting service user influence on policy. This is the third course in a sequence of three: SW 586, SW 587, SW 588 and must be taken in sequence.

Prerequisite: SW 587. Corequisite: SW 512.

**SW 589 - Advanced Standing Seminar (2)**

Seminar connects BSW and advanced MSW curriculum, discusses social work values and ethics, reviews the assessment process at five levels of social work practice, introduces incoming students to social work practice in Oregon, and assists students with successful entry into their advanced field placement.

Prerequisite: Admission to advanced standing program.

**SW 590 - Advanced Topics in Applied Research Methods for Social Work (3)**

Builds on foundation research methods and data analysis courses. Courses offered under this number present an evidence-based framework for social work practice and methods for analyzing quantitative data (e.g., multiple linear regression) and/or qualitative data (e.g., ethnography). Emphasizes application of methods to build knowledge in a specialized area relevant to a student’s field of practice and/or to complete an evaluation of program(s) or practice. Emphasizes interpretation of results to inform effective social work practice in community and agency-based settings. May be repeated for credit.

Prerequisite: SW 551 or SW 589 (Advanced standing only).

**SW 591 - Child & Adolescent Behavior & Development in the Social Environment: Advanced Theory & Research (3)**

Builds on micro and macro Human Behavior in the Social Environment and research methods. Presents ecological-developmental framework and culturally sensitive theories for understanding individual, family, peer, school, community, and societal influences on child and adolescent behavior and development. Presents prevention framework for using research-based knowledge of behavior and development.

Prerequisite: SW 540 or SW 589.
Prerequisite: SW 621, SW 634, SW 635.

**SW 625 - Poverty: Policies and Programs (3)**
Examines the nature and causes of poverty and inequality in the United States and the impact of economic globalization on social work’s response to these critical social problems. Studies ways in which people in poverty cope and support each other in low-income urban neighborhoods; examines the ways in which work and welfare interact with each other and with informal social supports. Addresses policy issues, including those involved in both service and income strategies to relieve or prevent poverty; develops skills for effective practice with low-income communities, families, and individuals. Also offered as SW 525 and may be taken only once for credit.
Prerequisite: SW 520 or SW 589 (Advanced standing only).

**SW 629 - International Mental Health Policy (3)**
Compares mental health policies from a global perspective, emphasizing United Nations and World Health Organization perspectives. Programs and policies from various countries are compared and contrasted with those of the U.S., and Oregon in particular. Also offered as SW 529 and may be taken only once for credit.
Prerequisite: SW 520 or SW 589 (Advanced standing only).

**SW 630 - Empirical Foundations of Knowledge Building in Social Work (3)**
Examines the assumptions and conceptual foundation of research in social work. Application of alternative research paradigms to questions important to social work. Context of community and social agency emphasized. Ethical issues of participation of vulnerable populations considered. Exploration of social implications of use of research findings.
Prerequisite: SW 630.

**SW 631 - Introduction to Quantitative Research Methods in Social Work (3)**
Introduces students to basic quantitative methods for applied social work research and examines the assumptions underlying quantitative methods. Reviews core elements of research design and the selection of appropriate methods to address specific types of research questions with attention to questions of ethics and research across diverse populations. Includes a review of internal and external validity issues in conducting experimental and quasi-experimental designs. Provides experience in applying quantitative methods by developing a proposal for social work research project.
Prerequisite: SW 630, 631.

**SW 632 - Quantitative Data Analysis in Social Work Research (4)**
Provides preparation in the selection and use of statistical methods appropriate for social work research questions. Covers descriptive statistics, probability theory, statistical inference, and basic inferential methods. Preparation for multivariate statistical methods. Empirical social work studies critiqued and discussed. Includes application and analysis laboratory.
Prerequisite: SW 630, 631.

**SW 633 - Quantitative Research I: Critical Research Frames and Beginning Practices (3)**
This course is the first part of a required three-term sequence that introduces students to the theoretical foundations and methods for qualitative research in social work. The class is designed to support learners with techniques and tools to approach the inquiry process from a critical perspective, as contextualized in the profession of social work. The forms of research methods covered in this research sequence (and introduced in this first course) cover qualitative research at the micro, mezzo and macro levels, specifically: individual lived experiences, society and culture, and language communication. In order to cover each of these levels of analysis, the course will address at least one research methodology in each of the three levels. These are hermeneutic phenomenology, life history research, critical ethnography, and critical discourse analysis.
Prerequisite: SW 630.

**SW 634 - Quantitative Data Analysis in Social Work Research II (4)**
Introductory multivariate statistical procedures. Core topics: correlation and partial correlation, reliability and validity of measures and scale construction, and linear and logistic regression. Covers considerations of level of measurement and distributional assumptions for each statistical procedure. Balances developing theoretical understanding and hands-on running of tests and interpretation of results.
Prerequisite: SW 632.

**SW 635 - Qualitative Research II: Collecting Data for Interpretive & Constructivist Research (3)**
The second course of a required three-term sequence. Data collection methods with a special emphasis on collecting stories and narratives to explore the individual, group, community, organizational, and national experience.
Prerequisite: SW 630 and SW 633.

**SW 637 - Qualitative Research III: Making Sense of Qualitative Research Findings (3)**
The third course in the required qualitative sequence focuses on data analysis and reporting findings. Centers on methods of data description, analysis, interpretation, and presentation. Consideration of issues of power, privilege, and oppression in the data analysis and representation of the experiences and perspectives of study participants, and strategies for addressing issues of researcher subjectivity and criteria for rigor. Ethical issues in analysis and dissemination will be examined. Apply qualitative data analysis methodologies with data collected during the first two courses in this sequence, as well as writing up and disseminating qualitative research. Introduction to the uses of computer assisted qualitative data analysis software.
Prerequisite: SW 633 and SW 635.

**SW 640 - Research Practicum and Seminar (2)**
Participation in a research study under the supervision of appropriate faculty. Opportunity to master research skills which fit the student’s learning needs. Time on site working on the project is 200 hours. Seminar taken concurrently with practicum enables students to explore together their research experiences in their respective research projects. Students will gain deepening knowledge through comparison of experiences. Pass/no pass only. This is the first course in a sequence of three: SW 640, SW 641, and SW 642.
Prerequisite: SW 634.
SW 641 - Research Practicum and Seminar (2)
Participation in a research study under the supervision of appropriate faculty. Opportunity to master research skills which fit the student's learning needs. Time on site working on the project is 200 hours. Seminar taken concurrently with practicum enables students to explore together their research experiences in their respective research projects. Students will gain deepening knowledge through comparison of experiences. Pass/no pass only. This is the second course in a sequence of three: SW 640, SW 641, and SW 642.
Prerequisite: SW 634.

SW 642 - Research Practicum and Seminar (2)
Participation in a research study under the supervision of appropriate faculty. Opportunity to master research skills which fit the student's learning needs. Time on site working on the project is 200 hours. Seminar taken concurrently with practicum enables students to explore together their research experiences in their respective research projects. Students will gain deepening knowledge through comparison of experiences. Pass/no pass only. This is the third course in a sequence of three: SW 640, SW 641, and SW 642.
Prerequisite: SW 634.

SW 644 - Mid-Life and Beyond (3)
Focuses on development in mid and late adulthood from a lifespan perspective. Promotes appreciation of the developmental potential for normal and healthy aging. Explores demographic, socio-historical and developmental characteristics of currently emerging older adults. Focuses on current developmental theories in social cognition and identity development in mid and late adulthood.

SW 645 - Advanced Human Behavior in the Social Environment (3)
Provides an opportunity for students to explore current theoretical developments in the social and behavioral sciences which apply to social work practice including populations at risk. Taught in different sections each of which covers social and cultural contexts for human behavior in the social environment. May be repeated for additional credit. Also offered as SW 545.
Prerequisite: SW 540, SW 541 or SW 589 (Advanced standing only).

SW 650 - History and Philosophy of Social Welfare and Social Work (3)
History, philosophy, and ethics of social welfare and social work. Focus is on the interaction of social work and social welfare developments with wider economic, social, and political forces. Major philosophical, theoretical, and political issues, the growth and impact of professionalization, and the development of social work methods. Traces historical changes in social work's identification of and response to vulnerable populations.

SW 651 - Integrative Writing Seminar (1)
Course addresses integration of social work theory, practice, policy, and research. Synthesis developed through writing of manuscript for submission to professional journal, a grant application, or other suitable product. Assistance with submission provided.
Prerequisite: completion of Part I of comprehensive examinations. May be repeated for additional credit.

SW 653 - PhD Data Analysis Seminar (1)
Provides a structure to facilitate a working group of researchers who share ideas and support one another in the conduct of research. Group members may work together on research projects as well as use the group to consult about independent research projects. Expected themes include research design issues, measurement selection, rating and coding procedures, data analysis and presentation and reporting of research results. The primary focus of this group is on quantitative methods, with secondary attention to qualitative methods. Course may be repeated for credit.
Prerequisite: SW 634.

SW 660 - Ph.D. Seminar (1)
Discusses current research studies undertaken in the field of social work. Based on published articles, working papers, and research project materials, the seminar features presentations by social work faculty, graduate students, and community partners. Considers practical aspects of applied research, including methodological issues, cultural competency, consumer involvement, and interdisciplinary collaboration. May be repeated for additional credit.

SW 678 - Social Work in the Juvenile and Criminal Justice Systems (3)
Analyzes current controversies concerning the origin and meaning of criminal and delinquent behavior; the socio-economic and multicultural characteristics of contemporary life contributing to delinquency and crime; social work's role in the "people processing system"; the major current modalities and inquiry into their effectiveness; social policy issues confronting the juvenile justice system; and current policy and practice trends toward incarceration and away from rehabilitation. Also offered as SW 578 and may be taken only once for credit.
Prerequisite: SW 520 or SW 589 (Advanced standing only).

SW 690 - Teaching Practicum (2)
Focuses on the practical aspects of teaching in the social work field. Salient theoretical and practical issues in adult learning explored. Considers the fundamental ideas of social work education. Discusses curriculum planning and issues around human diversity and teaching. Distance learning issues and techniques examined. Supports student teaching experiences.

SW 700 - Postbaccalaureate Professional Development (1-6)
(Credit to be arranged.)

SySc - Systems Science
SySc 330 - Models in Science (4)
This interdisciplinary course focuses on the role of models in scientific inquiry. Students explore how scientists from a variety of disciplines use different types of models, including physical (scale), mathematical (analytic and numeric), agent-based, animal, and network. The course has three stages of inquiry: Definition, Analysis, and Synthesis.

SySc 330U - Models in Science (4)
This interdisciplinary course focuses on the role of models in scientific inquiry. Students explore how scientists from a variety of disciplines use different types of models,
including physical (scale), mathematical (analytic and numeric), agent-based, animal, and network. The course has three stages of inquiry: Definition, Analysis, and Synthesis.

**SySc 332 - Introduction to Agent-Based Modeling (4)**

At the crossroads of biology, ecology, economics, philosophy, and artificial intelligence, this course introduces Agent-Based Modeling: a new computer-based approach that’s grounded in the perspective that the complex macro-level patterns we observe in social systems are emergent from decentralized and self-organizing micro-level interaction among agents following simple and localized rules.

**SySc 332U - Introduction to Agent-Based Modeling (4)**

At the crossroads of biology, ecology, economics, philosophy, and artificial intelligence, this course introduces Agent-Based Modeling: a new computer-based approach that’s grounded in the perspective that the complex macro-level patterns we observe in social systems are emergent from decentralized and self-organizing micro-level interaction among agents following simple and localized rules.

**SySc 334 - Modeling Social-Ecological Systems (4)**

Understanding social and ecological cycles and the interaction between social and ecological systems is essential for making human actions more sustainable. This course uses ideas from UNEP’s Green Economy Initiative and an easy-to-learn computer modeling approach called System Dynamics to explore the interaction between and dynamics within social-ecological systems.

**SySc 334U - Modeling Social-Ecological Systems (4)**

Understanding social and ecological cycles and the interaction between social and ecological systems is essential for making human actions more sustainable. This course uses ideas from UNEP’s Green Economy Initiative and an easy-to-learn computer modeling approach called System Dynamics to explore the interaction between and dynamics within social-ecological systems.

**SySc 336 - Networks and Society (4)**

Introduces the new science of networks and its role in modeling the inherently complex problems of an interconnected, global society. Simulations explore the evolution of hierarchical, small-world and scale-free network structures and their dynamic behaviors. Implications for information democracy, cyber-terrorism, alternative economies (among other topics of student interest) are discussed.

Prerequisite: upper-division standing.

**SySc 336U - Networks and Society (4)**

Introduces the new science of networks and its role in modeling the inherently complex problems of an interconnected, global society. Simulations explore the evolution of hierarchical, small-world and scale-free network structures and their dynamic behaviors. Implications for information democracy, cyber-terrorism, alternative economies (among other topics of student interest) are discussed.

Prerequisite: upper-division standing.

**SySc 338 - Decision Making in Complex Environments: A View Towards Collective Action and Social Change (4)**

An interdisciplinary course that explores the heuristics through which individuals, groups and communities make their decisions in response to their environmental conditions. Such actions are sometimes optimal, sometimes sub-optimal and sometimes outright irrational and harmful and the course identifies the reasons for deviations from rational behavior.

**SySc 338U - Decision Making in Complex Environments: A View Towards Collective Action and Social Change (4)**

An interdisciplinary course that explores the heuristics through which individuals, groups and communities make their decisions in response to their environmental conditions. Such actions are sometimes optimal, sometimes sub-optimal and sometimes outright irrational and harmful and the course identifies the reasons for deviations from rational behavior.

**SySc 346 - Exploring Complexity in Science and Technology (4)**

Introduction to Complex Systems, an interdisciplinary field that studies how collections of simple entities organize themselves to produce complex behavior, use information, and adapt and learn. Focus on common principles underlying complexity in science and technology, and includes ideas from physics, biology, the social sciences, and computer science. This course is the same as CS 346; course may be taken only once for credit.

Crosslisted as: CS 346.

**SySc 346U - Exploring Complexity in Science and Technology (4)**

Introduction to Complex Systems, an interdisciplinary field that studies how collections of simple entities organize themselves to produce complex behavior, use information, and adapt and learn. Focus on common principles underlying complexity in science and technology, and includes ideas from physics, biology, the social sciences, and computer science. This course is the same as CS 346; course may be taken only once for credit.

Crosslisted as: CS 346U.

**SySc 350 - Indigenous and Systems Perspectives on Sustainability (4)**

Explores sustainability by drawing upon the field of Systems Science and the perspectives of traditional and contemporary indigenous peoples and scholars. Dialogue-oriented format and small group exercises promote a cooperative, student-driven learning environment. Course work calls upon students to apply their developing understanding of sustainability to their own lives.

**SySc 350U - Indigenous and Systems Perspectives on Sustainability (4)**

Explores sustainability by drawing upon the field of Systems Science and the perspectives of traditional and contemporary indigenous peoples and scholars. Dialogue-oriented format and small group exercises promote a cooperative, student-driven learning environment. Course work calls upon students to apply their developing understanding of sustainability to their own lives.

**SySc 399 - Special Studies (4)**

(Credit to be arranged.)

**SySc 399U - Special Studies (4)**

(Credit to be arranged.)
SySc 401 - Research (1-8)
(Credits to be arranged.)
SySc 403 - Honor Thesis (1-8)
(Credits to be arranged.)
SySc 405 - Reading and Conference (1-8)
(Credits to be arranged.)
SySc 406 - Special Projects (1-12)
(Credits to be arranged.)
SySc 407 - Seminar (1-8)
(Credits to be arranged.)
SySc 409 - Practicum (1-8)
(Credits to be arranged.)
SySc 410 - Selected Studies (1-6)
(Credit to be arranged.)
SySc 413 - Holistic Strategies for Problem Solving (4)
This course focuses on the application of Systems ideas and practitioner skill development across disciplines. Readings and diversified class sessions explore topics including the meaning of "holistic," multiple levels of analysis, multiple perspectives, values, learning organizations, frameworks/processes for problem-solving, and use of tools like graphic representations and causal-loop diagramming. Also offered for graduate-level credit as SySc 513 and may be taken only once for credit.
Prerequisite: upper-division standing and/or admission to the Honors College or one SySc cluster course.
SySc 421 - Systems Philosophy (4)
A study of ideas central to systems theory and philosophy. The course focuses on concepts rather than mathematics, and organizes systems ideas around the theme of the fundamental "difficulties" (problems, imperfections, modes of failure) encountered by systems of widely differing types. Though these systems ideas often come from the natural sciences and engineering, they are significant also for the social sciences, the professional fields, and even the arts and humanities. Also offered for graduate-level credit as SySc 521 and may be taken only once for credit.
Prerequisite: upper-division standing and/or admission to the Honors College or one SySc cluster course.
SySc 423 - Systems Ideas and Sustainability: Limits, Structural Change, and Resilience (4)
This course offers a systems-theoretic perspective on sustainability. Using graph theory, non-linear dynamics, game/decision theory, thermodynamics, and theories of complexity and complex adaptive systems, the course explores systems insights into the challenge of environmental, economic, and social sustainability and systems principles to help us meet this challenge. Also offered for graduate-level credit as SySc 523 and may be taken only once for credit.
Prerequisite: upper-division standing and completion of one of the SySc 300-level cluster courses.
SySc 431 - Data Mining with Information Theory (4)
DMIT is a hands-on project-based course in which students use information- and graph-theoretic methods to analyze their own data to discover complex and nonlinear interactions. These methods are implemented in OCCAM, software developed at PSU, the main analytical tool used in the course. Also offered for graduate-level credit as SySc 531 and may be taken only once for credit.
Prerequisite: upper-division standing and completion of one of the SySc cluster courses.
SySc 452 - Game Theory (4)
Study of cooperation, competition, and conflict in social systems and associated issues of rationality. Emphasis is on game-theoretic models, particularly of dilemmas of collective action, their possible solutions, and their applications to social, economic, and political phenomena. Also covered are social choice theory, and other systems-theoretic approaches to cooperation, competition and conflict. Also offered for graduate-level credit as SySc 552 and may be taken only once for credit.
SySc 501 - Research (1-9)
(Credits to be arranged.)
SySc 503 - Thesis (1-9)
(Credits to be arranged.)
SySc 505 - Reading and Conference (1-6)
(Credits to be arranged.)
SySc 506 - Special Projects (1-6)
(Credits to be arranged.)
SySc 507 - Seminar (1-6)
(Credits to be arranged.)
SySc 508 - Workshop (2-6)
(Credits to be arranged.)
SySc 509 - Practicum (1-9)
(Credits to be arranged.)
SySc 510 - Selected Studies (1-6)
(Credits to be arranged.)
SySc 511 - Systems Theory (4)
Surveys fundamental systems concepts and central aspects of systems theory. The course begins with an overview of the systems paradigm and the systems field as a whole. Topics then include introductions to set and information-theoretic multivariate relations and structures, discrete dynamic systems; model representation and simulation; decision analysis, optimization, game theory; artificial intelligence, complex adaptive systems. Readings drawn from mathematics, the natural and social sciences, and the professional disciplines (e.g., engineering, business). Course content derives both from "classical" general systems theory, cybernetics, and operations research as well as from contemporary systems research, which is organized around the themes of nonlinear dynamics, complexity, and adaptation.
Prerequisite: graduate standing, calculus, probability, computer programming. .
SySc 512 - Quantitative Methods of Systems Science (4)

An introduction to the quantitative representation and investigation of systems with a focus that emphasizes tools more than applications. Topics include linear dynamics, optimization, and uncertainty. The level of presentation assumes familiarity and facility with calculus. Notions from linear algebra unify the topics and those notions will be presented. Required coursework includes both calculations to be done on a computer and calculations to be done by hand.

Prerequisite: one year of calculus, probability and familiarity with computers, graduate standing.

SySc 513 - Holistic Strategies for Problem Solving (4)

This course focuses on the application of Systems ideas and practitioner skill development across disciplines. Readings and diversified class sessions explore topics including the meaning of "holistic," multiple levels of analysis, multiple perspectives, values, learning organizations, frameworks/processes for problem-solving, and use of tools like graphic representations and causal-loop diagramming. Also offered for undergraduate-level credit as SySc 413 and may be taken only once for credit.

Prerequisite: upper-division standing and completion of one SySc cluster course or permission of instructor.

SySc 514 - System Dynamics (4)

Introduces concepts and a methodology for analyzing the behavioral dynamics of systems that consist of complex "webs" of feedback loops. Primary emphasis is on building computer models of these systems and using these models to enhance understanding, make predictions, and find ways to improve the performance of systems and processes. Models are defined in terms of a set of "rate" equations that are numerically integrated to simulate behavior over time. The process of applying this methodology to real world situations is discussed in detail.

Prerequisite: graduate standing.

SySc 516 - Systems Thinking for Business (4)

Learn highly applied system thinking that delivers crucial insights into business or career situations where the usual methods are lacking. Specifically, to develop qualitative skills: system archetypes, leverage points, strategic behavior and game theory, ecosystems and evolution, and networks; and to gain high-level working knowledge of system modeling and simulation. Also offered for undergraduate-level credit as SySc 416 and may be taken only once for credit.

Prerequisite: upper-division standing.

SySc 518 - System Sustainability and Organizational Resilience (4)

Organizations are complex adaptive systems coupled with their environment, supply chains, strategic partners, and competitors. Survival depends on structural resilience market turbulence, and the environmental/political climate. Principles of emergent leadership and living systems are applied to various fields including strategic business management, environmental stewardship, health and public administration, technology management.

Prerequisite: upper-division standing.

SySc 521 - Systems Philosophy (4)

A study of ideas central to systems theory and philosophy. The course focuses on concepts rather than mathematics, and organizes systems ideas around the theme of the fundamental "difficulties" (problems, imperfections, modes of failure) encountered by systems of widely differing types. Though these systems ideas often come from the natural sciences and engineering, they are significant also for the social sciences, the professional fields, and even the arts and humanities. Also offered for undergraduate-level credit as SySc 421 and may be taken only once for credit.

Prerequisite: upper-division standing and/or admission to the Honors College or one SySc cluster course.

SySc 523 - Systems Ideas and Sustainability: Limits, Structural Change, and Resilience (4)

This course offers a systems-theoretic perspective on sustainability. Using graph theory, non-linear dynamics, game/decision theory, thermodynamics, and theories of complexity and complex adaptive systems, the course explores systems insights into the challenge of environmental, economic, and social sustainability and systems principles to help us meet this challenge. Also offered for undergraduate-level credit as SySc 423 and may be taken only once for credit.

Prerequisite: upper-division standing and completion of one of the SySc 300-level cluster courses.

SySc 525 - Agent Based Simulation (4)

Introduction to simulation methods that impart simple rules to collections of "agents" that interact within an environment represented as a spatial grid. The properties of the agents and the environment vary dynamically, and often result in behavior patterns that are complex in ways that are not readily apparent from an examination of the rules that generated the behavior. Such behavior is often referred to as emergent, with examples including flocks of birds, traffic jams, ant colonies, crowd phenomena, etc. Of particular interest is the fact that such phenomena occur without centralized control. This approach is often used to study social systems, but may be used to study a variety of natural and non-natural systems. Also offered as SySc 625 and may be taken only once for credit.

SySc 527 - Discrete System Simulation (4)

The primary focus is on the application of discrete system simulation to real world problems using the Arena simulation language. The mathematical basis for discrete system simulation is probability theory and queuing theory. It is used extensively in the fields of operations research, civil engineering, and industrial engineering. Students apply the tools to projects within their fields of interest. Also offered as SySc 627 and may be taken only once for credit.

Prerequisite: graduate standing or consent of the instructor.

SySc 529 - Business Process Modeling and Simulation (4)

The primary focus is on the application of system simulation to process flow problems. Extend, a special-purpose computer simulation language, is used to develop models to describe and analyze both continuous and discrete flow processes in order to better understand bottlenecks and how to alleviate them. Such models are used to study, for example, manufacturing systems, business systems, and engineering systems. Students apply the concepts to projects within their fields of interest. Also
offered as SySc 629 and may be taken only once for credit.

Prerequisite: graduate standing or consent of the instructor.

**SySc 531 - Data Mining with Information Theory (4)**

DMIT is a hands-on project-based course in which students use information- and graph-theoretic methods to analyze their own data to discover complex and nonlinear interactions. These methods are implemented in OCCAM, software developed at PSU, the main analytical tool used in the course. Also offered for undergraduate-level credit as SySc 431 and may be taken only once for credit.

Prerequisite: upper-division standing and completion of one of the SySc cluster courses.

**SySc 551 - Discrete Multivariate Modeling (4)**

This course focuses on information theory as a tool for modeling and multivariate analysis and as a general framework for the study of structure and organization. The course examines the use of set- and information-theoretic techniques for the analysis of constraints in qualitative, as well as quantitative, data. Also covered are software implementations, relations to log-linear methods, and applications in the natural and social sciences and the arts. Also offered as SySc 651 and may be taken only once for credit.

**SySc 552 - Game Theory (4)**

Study of cooperation, competition, and conflict in social systems and associated issues of rationality. Emphasis is on game-theoretic models, particularly of dilemmas of collective action, their possible solutions, and their applications to social, economic, and political phenomena. Also covered are social choice theory, and other systems-theoretic approaches to cooperation, competition and conflict. Also offered for undergraduate-level credit as SySc 452 and may be taken only once for credit.

**SySc 553 - Manufacturing Systems Simulation (4)**

Application of discrete systems simulation to manufacturing processes, including production cells, assembly operations, materials handling, and scheduling. Students also learn general systems modeling concepts, such as how to model random processes and probabilistic events, and how to use a specific simulation package that features realistic animation of the system under study. This course is the same as ETM 553/653; also offered as SySc 653 and may only be taken once for credit.

Prerequisite: basic knowledge of probability and statistics, and some exposure to manufacturing processes and terminology. Crosslisted as: ETM 553.

**SySc 555 - Systems Planning and Management (3)**

Contact department for a description for this course.

**SySc 557 - Artificial Life (4)**

Artificial life (ALife) encompasses mathematical and computational studies of phenomena such as replication, metabolism, morphogenesis, learning, adaptation, and evolution. Situated at the intersection of computer science and biology (also physics and chemistry) and focused on abstract, materiality-independent aspects of life, its purpose is two-fold: to understand biological phenomena and to develop computational technologies. ALife bears significantly also on the social sciences and philosophy. It is part of the research program into "complex adaptive systems". Emphasizes (1) cellular automata (and other discrete dynamical models), (2) ecological and evolutionary simulations, and (3) genetic algorithm optimization and adaptation. Other topics include artificial chemistry (metabolism and origins of life) and philosophical issues. Also offered as SySc 657 and may be taken only once for credit.

Prerequisite: graduate standing, calculus, probability, computer programming.

**SySc 575 - AI: Neural Networks I (4)**

Introduces approach for developing computing devices whose design is based on models taken from neurobiology and on notion of "learning." A variety of NN architectures and associated computational algorithms for accomplishing the learning are studied. Experiments with various available architectures are performed via a simulation package. Students do a major project on the simulator or a special programming project.

Prerequisite: graduate standing. .

**SySc 601 - Research (0-15)**

(Credit to be arranged.)

**SySc 603 - Dissertation (0-15)**

(Credit to be arranged.)

**SySc 605 - Reading and Conference (0-9)**

(Credit to be arranged.)

**SySc 607 - Seminar (1-9)**

(Credit to be arranged.)

**SySc 608 - Workshop (1-9)**

(Credit to be arranged.)

**SySc 610 - Selected Studies (1-9)**

(Credit to be arranged.)

**SySc 625 - Agent Based Simulation (4)**

Introduction to simulation methods that impart simple rules to collections of "agents" that interact within an environment represented as a spatial grid. The properties of the agents and the environment vary dynamically, and often result in behavior patterns that are complex in ways that are not readily apparent from an examination of the rules that generated the behavior. Such behavior is often referred to as emergent, with examples including flocks of birds, traffic jams, ant colonies, crowd phenomena, etc. Of particular interest is the fact that such phenomena occur without centralized control. This approach is often used to study social systems, but may be used to study a variety of natural and non-natural systems. Also offered as SySc 525 and may be taken only once for credit.

**SySc 627 - Discrete System Simulation (4)**

The primary focus is on the application of discrete system simulation to real world problems using the Arena simulation language. The mathematical basis for discrete system simulation is probability theory and queuing theory. It is used extensively in the fields of operations research, civil engineering, and industrial engineering. Students apply the tools to projects within their fields of interest. Also offered as SySc 527 and may be taken only once for credit.

Prerequisite: graduate standing or consent of the instructor. .
The primary focus is on the application of system simulation to process flow problems. Extend, a special-purpose computer simulation language, is used to develop models to describe and analyze both continuous and discrete flow processes in order to better understand bottlenecks and how to alleviate them. Such models are used to study, for example, manufacturing systems, business systems, and engineering systems. Students apply the concepts to projects within their fields of interest. Also offered as SySc 529 and may be taken only once for credit.

Prerequisite: graduate standing or consent of the instructor.

**SySc 651 - Discrete Multivariate Modeling (4)**

This course focuses on information theory as a tool for modeling and multivariate analysis and as a general framework for the study of structure and organization. The course examines the use of set- and information-theoretic techniques for the analysis of constraints in qualitative, as well as quantitative, data. Also covered are software implementations, relations to log-linear methods, and applications in the natural and social sciences and the arts. Also offered as SySc 551 and may be taken only once for credit.

**SySc 653 - Manufacturing Systems Simulation (4)**

Application of discrete systems simulation to manufacturing processes, including production cells, assembly operations, materials handling, and scheduling. Students also learn general systems modeling concepts, such as how to model random processes and probabilistic events, and how to use a specific simulation package that features realistic animation of the system under study.

Prerequisite: basic knowledge of probability and statistics, and some exposure to manufacturing processes and terminology. This course is the same as ETM 553/653; also offered as SySc 553 and may only be taken once for credit. Crosslisted as: ETM 653.

**SySc 657 - Artificial Life (4)**

Artificial life (ALife) encompasses mathematical and computational studies of phenomena such as replication, metabolism, morphogenesis, learning, adaptation, and evolution. Situated at the intersection of computer science and biology (also physics and chemistry) and focused on abstract, materiality-independent aspects of life, its purpose is two-fold: to understand biological phenomena and to develop computational technologies. ALife bears significantly also on the social sciences and philosophy. It is part of the research program into "complex adaptive systems". Emphasizes (1) cellular automata (and other discrete dynamical models), (2) ecological and evolutionary simulations, and (3) genetic algorithm optimization and adaptation. Other topics include artificial chemistry (metabolism and origins of life) and philosophical issues. Also offered as SySc 557 and may be taken only once for credit.

Prerequisite: graduate standing, calculus, probability, computer programming.

**SysE - Systems Engineering**

**SysE 505 - Reading and Conference (1-8)**

(Credit to be arranged.)

**SysE 506 - Special Projects (1-9)**

(Credit to be arranged.)

**SysE 510 - Selected Studies (1-6)**

(Credit to be arranged.)

**SysE 561 - Logistics Engineering (4)**

Concentrates on logistics from a systems engineering perspective. Systems will include a mix of products and processes, materials, equipment, software, people, data, information, and services, within some form of hierarchy. The design for supportability/serviceability, the production and effective distribution for customer use, and the sustaining maintenance will be addressed on a total system life-cycle basis, with particular emphasis in the early phases of the development of new systems and/or reengineering of existing systems.

Prerequisite: basic knowledge of systems engineering concepts and statistics.

**SysE 567 - Systems Engineering Management (4)**

Management techniques applicable to Systems Engineering as part of its interface role to integrate project control (cost and scheduling) and technical specialties, including evaluating new technologies and integrating with legacy systems, technical performance measures, development-process tailoring, maturity assessment models, conducting technical reviews. Expected preparation: SysE 591.

**SysE 573 - Requirements Engineering (4)**

Students gain knowledge to translate needs and priorities into system requirements that are the starting point for the engineering of complex hardware/software systems. Topics include: larger context in which requirements for a system are developed; developing mission needs or market opportunities first versus assessing available technology first; translating needs and priorities into an operational concept and then into specific functional and performance requirements; assessment of requirements, including such aspects as correctness, completeness, consistency, measurability, testability and clarity of documentation; relationship between interface definitions and requirements; risk management of requirement issues, and stakeholders input to increase the prospects for project success. Case studies will be used, many provided by students and involving software-intensive systems. Recommended prerequisite: SysE 591.

**SysE 575 - Reducing Risk in Decision Making (4)**

Examines the concepts, techniques and tools for managing risk and making decisions as key components of the systems engineering process. Risk connotes a measure of the probability and severity of an undesired event. Begins with an overview of the risk management (identifying, assessing, monitoring, and mitigating) and decision process. Differences between mission critical and non-mission critical programmatic risk emphasized. Other topics include the limits of expected value-based risk analysis, decision making strategies such as max/min, min/max and regrets. Formal methods in risk analysis, elementary decision analysis and decision trees, multi-objective decision making, pareto techniques, optimality, and
trade-off analysis will be covered. Risk and decision techniques will be contrasted with the interfacing processes of program management and software engineering, from both the government and industrial perspectives.

Prerequisite: experience with systems engineering process.

**SysE 590 - Integrative Workshop (0-4)**

Systems engineering is an acquired behavior to be developed throughout the master's degree program. Students and faculty advisers will engage in creative workshop activities integrating technical specialty skills and project experience invoking systems engineering applications of communication, synthesis and creativity, team building, problem solving, management of time and resources, and system life-cycle thinking. A student portfolio will document the program plan and document that the desired behavioral change is taking place.

Prerequisite: consent of instructor. Pass/No pass only.

**SysE 591 - Systems Engineering Approach (4)**

Engineering of complex hardware, software systems encompasses quantitative methods to understand vague problem statements, determine what a proposed product/system must do (functionality), generate measurable requirements, decide how to select the most appropriate solution design, integrate the hardware and software subsystems, and test the finished product to verify it satisfies the documented requirements. Additional topics that span the entire product life cycle include interface management and control, risk management, tailoring of process to meet organizational and project environments, configuration management, test strategies, and trade-off studies.

Prerequisite: consent of instructor.

**SysE 595 - Hardware-Software Integration (4)**

Systems engineering is applied to the integration of hardware-software systems, focusing on embedded computer products development and information technology systems. Factors that affect the selection of hardware and software solutions in design will be examined, as well as the use of trade studies to optimize the efficiency of integration issues. Techniques for partitioning of system-level functions and requirements to hardware/software components will be provided, as will practical guidance, through case studies, process templates, and design checklists.

Prerequisite: basic understanding of hardware and software development.

**TA - Theater Arts**

**TA 101 - Theater Appreciation (4)**

This course is intended as a general introduction to the art of the theater: acting; directing; playwriting; scenic, costume, and lighting design. Emphasis is placed on theater as a performing art today rather than upon the history or origins of the theater. The class, in part, involves attendance at live performances and events in the Portland area.

**TA 102 - Introduction to Acting (4)**

A study in the basic building blocks of how to approach, prepare, and act a role. Text analysis, improvisation, exercises to expand the imaginative world of the play, preparation, commitment to an action, commitment to body and voice exercises to increase awareness, and how to work collaboratively.

**TA 111 - Stagecraft (3)**

An introduction to backstage fundamentals and the tools and techniques used to build scenery and stage props; also covered are: stage machinery, rigging, and basic lighting and sound system implementation.

**TA 114 - Technical Theater Production I (1)**

Attached lab to TA 111, TA 112 will combine skills in practical construction of stage sets with actual production experience on department productions. This is the first lab in a sequence of two: TA 114 and TA 115 which must be taken in sequence.

**TA 121 - Introduction to Design for Theater (4)**

Introduces the four primary fields of theatrical design - scenery, costumes, lighting and sound, with an emphasis on analysis, research, and the exploration of design ideas. Basic artistic skills and techniques introduced to aid development of the skills required to communicate design. Technical skills are not required.

**TA 134 - Workshop Theater: Scenery, Costume & Lighting Production I (1)**

A study and practical application of skills related to scenery, costume, and lighting for the theater. Students will learn through participating on construction and implementation and/or run crews for the departmental production.

**TA 144 - Voice for the Actor I (3)**

An introductory course in basic principles and techniques of voice production specifically for stage performance including physiology, breath support and resonance, articulation and projection.

**TA 145 - Acting Workshop (1-4)**

Rehearsal, performance, and analysis of scenes directed by Directing I students for studio presentation and critique.

Prerequisite: TA 141. Maximum: 6 credits.

**TA 146 - Acting/Playwriting Workshop (3)**

Readings, discussions, and walk-throughs of plays written by Playwriting II students.

Prerequisite: TA 142.

**TA 147 - Movement for the Actor (3)**

Introduction to concepts and techniques of theatrical movement and physical theater. Will utilize a variety of relaxation, centering, stylization, and imagery exercises designed to increase body awareness and expressiveness. Skills in ensemble, mime, mask, and light acrobatics will be developed.

**TA 151 - Introduction to Theater Arts & Practice (4)**

Investigates theater as both a dramatic art and an industry. Introduces topics in theater history, playwriting, performance, design, and theater management. Students exposed to a variety of productions and theater professions in the Portland community.

**TA 199 - Special Studies (1-12)**

(Credit to be arranged.)

**TA 201 - Script Analysis (4)**

Examination and analysis of fundamental principles of dramatic structure, form, and style though study and analysis of representative plays selected from major
TA 234 - Workshop Theater: Scenery, Costume & Lighting Production II (1)
A study and practical application of skills related to scenery, costume, and lighting for the theatre. Students will learn through participating on construction and implementation and/or run crews for the departmental production. 200 level workshops assume familiarity with the shop(s); a higher level of responsibility will be expected.
Prerequisite: TA 134.

TA 241 - Improvisational Acting I (3)
Seeks to acquaint the student through exercises, theater games, and study of basic techniques for creative role playing with the skills and techniques necessary for improvisational acting and development of material for public performance. This is the first course in a sequence of two: TA 241 and TA 242 which must be taken in sequence.

TA 242 - Improvisational Acting II (3)
Seeks to acquaint the student through exercises, theater games, and study of basic techniques for creative role playing with the skills and techniques necessary for improvisational acting and development of material for public performance. This is the second course in a sequence of two: TA 241 and TA 242 which must be taken in sequence.

TA 248 - Acting I: Process (4)
The first acting class for the major. Emphasis on the building blocks of actor technique leading into scene work: text analysis for the actor, preparation, commitment, character arc, boldness, rhythm, living a life onstage, and collaboration. This course is rigorous and demands outside time commitment for rehearsal.
Prerequisite: TA major; sophomore standing.

TA 252 - Stage Makeup (2)
A study of the basic principles of the art and technique of makeup for stage and screen.

TA 253 - Workshop Theater I- (1-3)
Training in theater production through the intensive study and rehearsal of scenes and plays. Maximum: 12 credits.

TA 299 - Special Studies (1-4)
(Credit to be arranged.)

TA 305 - Understanding Theater (4)
An investigation of theater designed to develop a heightened awareness of how the theater arts express and communicate ideas and experiences. To expand critical awareness of the process by which theater creates meaning and communicates through performance to contemporary audiences. Course will examine the dynamic relationship between theater and the society it both mirrors and influences.

TA 305U - Understanding Theater (4)
An investigation of theater designed to develop a heightened awareness of how the theater arts express and communicate ideas and experiences. To expand critical awareness of the process by which theater creates meaning and communicates through performance to contemporary audiences. Course will examine the dynamic relationship between theater and the society it both mirrors and influences.

TA 311 - Scene Design I (4)
A study of visual arts principles as related to scenic design. Projects in stage geography, design composition, and visual imagery are used to develop the student’s communication skills in the area of scenic design.
Prerequisite: TA 111, 112, 301, 316. Recommended: TA 114 and 115.

TA 312 - Scene Painting (3)
Training to extend the student's basic skills in traditional methods and techniques of scene painting.
Prerequisite: TA 111, 112. Recommended: TA 114, 115, and 316.

TA 313 - Scene Design II (3)
Basic principles of scenic design for the theater.
Prerequisite: TA 311.

TA 314 - Lighting Design I (3)
Practical and theoretical study of lighting the stage. Developing student awareness of how light affects objects in the theater laboratory and the crafting of intelligent lighting plots.
Prerequisite: TA 301, TA 316.

TA 316 - Technical Theater Lab (2)
Laboratory course designed to allow students to further develop stagecraft skills and gain additional practical production experience. Expected preparation: TA 114 and TA 115.
Prerequisite: TA 111.

TA 317 - Theater Technologies (2)
The study and practical application of advanced techniques and materials in all aspects of stagecraft, including drafting and drawing for the scene shop, the organization and planning of scenery construction within a production calendar, and problem solving on current department productions. Expected preparation: TA 114, 115.
Prerequisite: TA 111, TA 316.

TA 321 - Introduction to Costume Design (4)
An introduction to the theory, techniques, and design principles of contemporary stage costumes.
Prerequisite: TA 111, TA 201.

TA 322 - History of Dress I (4)
Historical survey of dress in Western civilization from ancient Egyptian to modern times with emphasis on aesthetic, cultural, and political expressions of clothing. Course may be taken out of sequence.
Prerequisite: upper-division standing.

TA 322U - History of Dress I (4)
Historical survey of dress in Western civilization from ancient Egyptian to modern times with emphasis on aesthetic, cultural, and political expressions of clothing. Course may be taken out of sequence.
Prerequisite: upper-division standing.

TA 323 - History of Dress II (4)
Historical survey of dress in Western civilization from ancient Egyptian to modern times with emphasis on aesthetic, cultural, and political expressions of clothing. Course may be taken out of sequence.
Prerequisite: upper-division standing.

TA 323U - History of Dress II (4)
Historical survey of dress in Western civilization from ancient Egyptian to modern times with emphasis on aesthetic, cultural,
and political expressions of clothing. Course may be taken out of sequence.

Prerequisite: upper-division standing.

TA 325 - Costume Production (2)
A study and practical application of stage costume construction techniques, beginning and advanced. Students will participate in the construction of costumes for departmental productions. Recommended prerequisite: 3 credits of theater arts. Maximum 6 credits.

TA 326 - Pattern Development (1-4)
A study and practical application of the methods for creating patterns for theatrical costumes, including flat drafting, draping, and period pattern adaptation.

Prerequisite: TA 325. Recommended: TA 321.

TA 327 - Costume Technology (1-4)
A study and practical application of costume craft and decorative techniques, including fabric dyeing and painting and accessories fabrication. Recommended prerequisite: TA 321.

TA 330 - Multicultural Theater (4)
Exploration of the diversity of our society through theater --comparing and contrasting the works of certain ethnic specific writers and those writers often considered to be in the mainstream of the modern theater.

TA 330U - Multicultural Theater (4)
Exploration of the diversity of our society through theater --comparing and contrasting the works of certain ethnic specific writers and those writers often considered to be in the mainstream of the modern theater.

TA 333 - Workshop Theater: Directing/Stage Management/Dramaturgy (1)
For the School of Theatre and Film productions. Offerings include stage manager, assistant director, dramaturg, choreography, and music direction. Participants are required to audition or interview for Main Stage and/or Studio productions. Information about auditions/interviews is provided on the Theatre Call Board outside of LH 127. Meeting times are arranged by the director. Most performances and rehearsals are in the evening; therefore, evening classes will usually conflict. Technical rehearsal for mainstage productions require a full weekend technical schedule. Course is repeatable for credit.

TA 334 - Workshop Theater: Scenery, Costume & Lighting Production 3 (1-2)
For PSU Theater Department productions. Offerings include scene construction and painting, costume construction and crew, stage/run crews, props, sound design and crew, lighting design and crew. Meeting times depend upon the assignment registered for, but usually include daytime, evening, and/or weekends. Technical rehearsal for mainstage productions require a full weekend technical schedule. Course is repeatable for credit.

TA 335 - Workshop Theater: Management/Publicity (1)
For PSU Theater Department productions. Offerings include house management, public relations, audience development, publications, educational outreach, and display. This course meets each term for one hour per week as a group, with the remaining meeting times depending upon the specific assignments for the term in question. Meeting times depend upon the assignment registered for, but may include daytime, evening, and/or weekends. Course is repeatable for credit.

TA 340 - Acting II: Scene Study (4)
Building on TA 248, coursework deepens the student actor's understanding of arc, character development, commitment, rhythm of sound and language, and choices that ignite the text. Class demands commitment to intense scene work outside the classroom. Must be taken in sequence.

Prerequisite: TA 248, and permission of instructor.

TA 341 - Advanced Acting (4)
Builds on past lessons and explores the way we rehearse and apply our craft. Individual acting blocks are addressed. Advanced acting problems are explored through complex texts. Must be taken in sequence.

Prerequisite: TA major; TA 341, and permission of instructor.

TA 344 - Voice for the Actor II (3)
An intermediate course in the principles of voice production for the stage, concepts and techniques for adapting the voice to various stage environments, and techniques necessary for analyzing stage speech problems and developing appropriate solutions.

Prerequisite: TA 144.

TA 345 - Topics in Acting (1-4)
Intensive study of a particular subset of performance, for example, How 2 B Funny, Audition Techniques, Movement Performance or Stage Combat.

TA 346 - Stage Dialects (4)
An introduction to the method and techniques of dialect production for theatrical performance, including a survey of basic American, English, and European dialects.

TA 348 - Acting for the Camera (4)
An introduction to acting before the camera for film and video.

Prerequisite: TA 248 or consent of instructor.

TA 361 - Theater Appreciation (4)
An intermediate course in the art of the theater: acting; directing; playwriting; and, design. Special emphasis on theater as a performing art today, not the history or origins of the theater. Course involves in part, attendance at live performances in the Portland area.

Prerequisite: upper-division standing.

TA 363 - Development of Dramatic Art I (4)
Survey of dramatic literature and theater history from ancient times to the emergence of the modern theater in the 19th century. This is the first course in a sequence of two: TA 363, TA 364; the course is chronological in its presentation but each term may be taken separately.
An examination of ways in which women and sexuality have been represented in Western theatrical production since the Greeks. Selected topics will be analyzed relating feminist theories to the creation of the theater arts by women, with consideration of cultural contexts in which they work. Study of artistic practice by women in relation to issues of power, representation, and access.

**TA 369 - Women, Theater, and Society (4)**

This is the second course in a sequence of two: TA 363, TA 364; the course is chronological in its presentation but each term may be taken separately.

Prerequisite: upper-division standing.

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**TA 381L - Lab for TA 381 (0)**

Lab for TA 381.

Corequisite: TA 381.

**TA 383L - Lab for TA 383 (0)**

Lab for TA 383.

Corequisite: TA 383.

**TA 399 - Special Studies (1-6)**

(Credit to be arranged.)

**TA 401 - Research (1-6)**

(Credit to be arranged.)

**TA 402 - Independent Study (1-12)**

(Credit to be arranged.)

**TA 404 - Cooperative Education/Internship (1-12)**

(Credit to be arranged.)

**TA 405 - Reading and Conference (1-6)**

(Credit to be arranged.)

**TA 406 - Special Projects (1-6)**

(Credit to be arranged.)

**TA 407 - Seminar (1-6)**

(Credit to be arranged.) Recent topics have included Introduction to Playwriting and Women, Theater, and Society.

**TA 408 - Workshop (1-6)**

(Credit to be arranged.)

**TA 409 - Practicum (1-12)**

(Credit to be arranged.)

**TA 410 - Selected Topics (1-6)**

(Credit to be arranged.)

**TA 421 - Costume Design (3)**

An in-depth study of costume design principles. Emphasis is placed on the design of costumes for specific plays, using a variety of styles and rendering media. Also offered for graduate-level credit as TA 521 and may be taken only once for credit.

Prerequisite: TA 321. Recommended: TA 342.

**TA 435 - Lighting Design II (3)**

Advanced lighting design skills and techniques involving the practical application of script analysis and collaboration techniques while working in the department's Studio Theater lighting student-directed, one-act plays and/or participating in departmental stage productions. Also offered for graduate-level credit as TA 535.

Prerequisite: TA 314. Maximum: 6 credits.

**TA 440 - Advanced Acting Studio (1-4)**

Advanced studio work focusing on rehearsal technique, style, preparation, developing material, and working with diverse environments, all leading to a public performance. May be repeated for a total of 12 credit hours. Also offered for graduate-level credit as TA 540.

Prerequisite: TA major; TA 342, by audition/interview and permission of instructor.

**TA 454 - Directing I (4)**

Study and practice in play analysis and directing of scenes. Also offered for graduate-level credit as TA 554 and may be taken only once for credit. Expected preparation: TA 311, TA 321.

Prerequisite: TA 111, TA 201, TA 248.

**TA 455 - Directing II (4)**

Advanced practice in analysis and directing of plays for public performance. Also offered for graduate-level credit as TA 555 and may be taken only once for credit.

Prerequisite: TA 111, TA 316, TA 454.

**TA 460 - Advanced Directing (3)**

Specific problems in directorial methods and styles for presentation in public performance. Also offered for graduate-level credit as TA 560 and may be taken only once for credit.

Prerequisite: TA 455 or equivalent experience.

**TA 466W - Development of Dramatic Literature (3)**

A survey of dramatic literature from its beginnings to the emergence of the modern theater in the late 19th century together with pertinent facts on theaters and staging. The course is chronological in its presentation but each term may be taken separately.

**TA 467 - Modern Theater I (4)**

A consideration of theater and drama from the late 19th and early 20th century to the present. Representative plays chosen from continental European, English, Irish, and American repertories. Examination of key directors and trends in staging. Also offered for graduate-level credit as TA 567 and may be taken only once for credit. This is the first course in a sequence of two: TA 467 and TA 468. Courses may be taken out of sequence.

Prerequisite: upper-division standing.

**TA 468 - Modern Theater II (4)**

A consideration of theater and drama from the late 19th and early 20th century to the present. Representative plays chosen from continental European, English, Irish, and American repertories. Examination of key directors and trends in staging. Also offered for graduate-level credit as TA 568 and may
be taken only once for credit. This is the second course in a sequence of two: TA 467 and TA 468. Courses may be taken out of sequence.

Prerequisite: upper-division standing.

**TA 471 - Theater History: Periods and Topics (1-4)**

Concentrated study of a particular period and/or topic in theater history: for example, Ancient Greek Theater and Drama, Medieval and Renaissance Theater, Theater and Science, Restoration/18th Century Drama, American Theater and Drama, and Theatrical Expressionism. Also offered for graduate-level credit as 571. Expected preparation: TA 363 and TA 364 or appropriate sophomore inquiry course.

**TA 472 - Theater History: Major Figures (1-4)**

Concentrated study of the contribution of one or more major theater artists: for example, Ibsen, Stanislavsky, Appia, Brecht, and Artaud. Also offered for graduate-level credit as TA 572.

Prerequisite: upper-division standing.

**TA 474 - Dramatic Writing I (4)**

A sequence in scriptwriting involving analysis of dramatic structure, practical application of scriptwriting techniques. Also offered for graduate credit as TA 574 and may be taken only once for credit. This is the first course in a sequence of two: TA 474 and TA 475 which must be taken in sequence. Expected preparation: 8 credits of TA and/or English.

**TA 475 - Dramatic Writing II (4)**

A sequence in scriptwriting involving analysis of dramatic structure, practical application of scriptwriting techniques. Also offered for graduate credit as TA 575 and may be taken only once for credit. This is the second course in a sequence of two: TA 474 and TA 475 which must be taken in sequence.

Expected preparation: 8 credits of TA and/or English.

**TA 501 - Research (1-9)**

(Credit to be arranged.)

**TA 502 - Independent Study (1-12)**

(Credit to be arranged.)

**TA 503 - Thesis (1-9)**

(Credit to be arranged.)

**TA 504 - Cooperative Education/Internship (1-9)**

(Credit to be arranged.)

**TA 505 - Reading and Conference (1-6)**

(Credit to be arranged.)

**TA 506 - Special Projects (1-6)**

(Credit to be arranged.)

**TA 507 - Seminar (1-6)**

(Credit to be arranged.)

**TA 508 - Workshop (1-6)**

(Credit to be arranged.)

**TA 509 - Practicum (1-9)**

(Credit to be arranged.)

**TA 510 - Selected Topics (1-6)**

(Credit to be arranged.)

**TA 511 - Introduction to Theater Research (2)**

An introductory course in research methods and bibliography for graduate study in theater.

**TA 514 - History of Decor (4)**

A historical survey of period decor focusing on furniture and interior architectural detail from Egyptian to modern times with emphasis on periods most commonly used in theater production. Also offered for undergraduate-level credit as TA 414 and may be taken only once for credit. Expected preparation: 6 credits of theater arts.

**TA 540 - Advanced Acting Studio (1-4)**

Advanced studio work focusing on rehearsal technique, style, preparation, developing material, and working with diverse environments, all leading to a public performance. May be repeated for a total of 12 credit hours. Also offered for undergraduate-level credit as TA 440.

Prerequisite: TA major; TA 342, by audition/interview and permission of instructor.

**TA 554 - Directing I (4)**

Study and practice in play analysis and directing of scenes. Also offered for undergraduate-level credit as TA 454 and may be taken only once for credit.

**TA 555 - Directing II (4)**

Advanced practice in analysis and directing of plays for public performance. Also offered for undergraduate-level credit as TA 455 and may be taken only once for credit.

**TA 560 - Advanced Directing (3)**

Specific problems in directorial methods and styles for presentation in public performance. Also offered for undergraduate-level credit as TA 460 and may be taken only once for credit.

Prerequisite: TA 455 or equivalent experience.

**TA 567 - Modern Theater I (4)**

A consideration of theater and drama from the late 19th and early 20th century to the present. Representative plays chosen from continental European, English, Irish, and American repertories. Examination of key directors and trends in staging. Also offered for undergraduate-level credit as TA 467 and may be taken only once for credit. This is the first course in a sequence of two: TA 567 and TA 568. Courses may be taken out of sequence.

Prerequisite: upper-division standing.

**TA 568 - Modern Theater II (4)**

A consideration of theater and drama from the late 19th and early 20th century to the present. Representative plays chosen from continental European, English, Irish, and American repertories. Examination of key directors and trends in staging. Also offered for undergraduate-level credit as TA 468 and may be taken only once for credit. This is the second course in a sequence of two: TA 567 and TA 568. Courses may be taken out of sequence.

Prerequisite: upper-division standing.

**TA 571 - Theater History: Periods and Topics (1-4)**

Concentrated study of a particular period and/or topic in theater history: for example, Ancient Greek Theater and Drama, Medieval and Renaissance Theater, Theater and Science, Restoration/18th Century Drama, American Theater and Drama, and Theatrical Expressionism. Also offered for undergraduate-level credit as 471. Expected preparation: TA 464 and TA 465 or appropriate sophomore inquiry course.
TA 572 - Theater History: Major Figures (1-4)
Concentrated study of the contribution of one or more major theater artists: for example, Ibsen, Stanislavsky, Appia, Brecht, and Artaud. Also offered for undergraduate-level credit as TA 472.
Prerequisite: upper-division standing.

TA 574 - Dramatic Writing I (4)
A sequence in scriptwriting involving analysis of dramatic structure, practical application of scriptwriting techniques. Also offered for undergraduate credit as TA 474 and may be taken only once for credit. This is the first course in a sequence of two: TA 574 and TA 575 which must be taken in sequence.
Expected preparation: 8 credits of TA and/or English.

TA 575 - Dramatic Writing II (4)
A sequence in scriptwriting involving analysis of dramatic structure, practical application of scriptwriting techniques. Also offered for undergraduate credit as TA 475 and may be taken only once for credit. This is the second course in a sequence of two: TA 574 and TA 575 which must be taken in sequence.
Expected preparation: 8 credits of TA and/or English.

Tur 101 - First-year Turkish (4)
Introduction to Turkish. Emphasis on elements of grammar, vocabulary building, and conversation. Elementary reading. This is the first course in a sequence of three: Tur 101, Tur 102, and Tur 103.

Tur 102 - First-year Turkish (4)
Introduction to Turkish. Emphasis on elements of grammar, vocabulary building, and conversation. Elementary reading. This is the second course in a sequence of three: Tur 101, Tur 102, and Tur 103.

Tur 103 - First-year Turkish (4)
Introduction to Turkish. Emphasis on elements of grammar, vocabulary building, and conversation. Elementary reading. This is the third course in a sequence of three: Tur 101, Tur 102, and Tur 103.

Tur 199 - Special Studies (1-5)
(Credit to be arranged.)

Tur 201 - Second-year Turkish (4)
Intense review of materials introduced in first-year course and further development of communicative skill and reading comprehension. Elementary writing. This is the first course in a sequence of three: Tur 201, Tur 202, and Tur 203. Recommended prerequisite: Tur 103.

Tur 202 - Second-year Turkish (4)
Intense review of materials introduced in first-year course and further development of communicative skill and reading comprehension. Elementary writing. This is the second course in a sequence of three: Tur 201, Tur 202, and Tur 203. Recommended prerequisite: Tur 103.

Tur 203 - Second-year Turkish (4)
Intense review of materials introduced in first-year course and further development of communicative skill and reading comprehension. Elementary writing. This is the third course in a sequence of three: Tur 201, Tur 202, and Tur 203. Recommended prerequisite: Tur 103.

Tur 299 - Special Studies (1-12)
(Credit to be arranged.)

Tur 301 - Third-year Turkish (4)
Composition, conversation, readings in literature, and grammar review. This is the first course in a sequence of three: Tur 301, Tur 302, and Tur 303. Recommended prerequisite: Tur 203.

Tur 302 - Third-year Turkish (4)
Composition, conversation, readings in literature, and grammar review. This is the second course in a sequence of three: Tur 301, Tur 302, and Tur 303. Recommended prerequisite: Tur 203.

Tur 303 - Third-year Turkish (4)
Composition, conversation, readings in literature, and grammar review. This is the third course in a sequence of three: Tur 301, Tur 302, and Tur 303. Recommended prerequisite: Tur 203.

Tur 330 - Topics in Turkish Culture and Literature (4)
Development of Turkish life, thought, and arts from the late-Ottoman to contemporary period. Topics may include Westernization, emergence of journalism, influence of the French revolution, national literature, urbanization, "guest workers" in Europe, feminist revival, Marxism, Islamism, and popular culture. Conducted in English. This course may be taken twice for credit with different topics.

Tur 330U - Topics in Turkish Culture and Literature (4)
Development of Turkish life, thought, and arts from the late-Ottoman to contemporary period. Topics may include Westernization, emergence of journalism, influence of the French revolution, national literature, urbanization, "guest workers" in Europe, feminist revival, Marxism, Islamism, and popular culture. Conducted in English. This course may be taken twice for credit with different topics.

Tur 331 - Women and Gender in Turkey (4)
Explores construction of gender, women’s roles and issues through modern Turkish literature and culture. Conducted in English.

Tur 331U - Women and Gender in Turkey (4)
Explores construction of gender, women’s roles and issues through modern Turkish literature and culture. Conducted in English.

Tur 341 - Turkish Literature in Translation (4)
Study of texts representative of major Turkish authors, themes or genres from the modern period in translation. Examples are modern drama, realism, autobiography, contemporary novel. Conducted in English.

Tur 341U - Turkish Literature in Translation (4)
Study of texts representative of major Turkish authors, themes or genres from the modern period in translation. Examples are modern drama, realism, autobiography, contemporary novel. Conducted in English.

Tur 361 - Turkey through Film (4)
Viewing of feature films or made-for-TV series followed by discussion of social, historical, and artistic significance of the visual narratives. Individual directors like Yilmaz Güney, genres like comedy and period-dramas of the 1970s or 1960s may be used. Films have subtitles. Readings, viewings and discussions are in English. Expected preparation: Tur 203.
Tur 361U - Turkey through Film (4)
Viewing of feature films or made-for-TV series followed by discussion of social, historical, and artistic significance of the visual narratives. Individual directors like Yılmaz Güney, genres like comedy and period-dramas of the 1970s or 1960s may be used. Films have subtitles. Readings, viewings and discussions are in English. Expected preparation: Tur 203.

Tur 399 - Special Studies (1-4)
(Credit to be arranged.)

Tur 401 - Research (1-6)
(Credit to be arranged.)

Tur 404 - Cooperative Education/Internship (1-12)
(Credit to be arranged.)

Tur 410 - Selected Topics (1-6)
(Credit to be arranged.)

Tur 410U - Selected Topics (4)
(Credit to be arranged.)

Tur 416 - Readings in Turkish (2)
A variable-content course designed to give advanced students of Turkish experience reading in a variety of content areas. To be taken in conjunction with regularly scheduled co-requisite courses. Students taking a co-requisite course will do part of the required reading for that course in Turkish. Recommended prerequisite: Tur 341.

ULib - Library Research

Ulib 101 - Library Research Skills (2)
Introduces library research skills with a focus on information use in the digital environment. Topics include finding, evaluating, and using information ethically. Emphasizes research skills needed for undergraduate research assignments.

UnSt - University Studies

UnSt 194 - College Success Topics (3)
College Success is a comprehensive course designed to enhance student success and retention. Students will learn strategies for creating greater academic, professional, and personal success. Students will understand self-empowerment, personal responsibility, self-motivation, interdependence, self-awareness and other critical components of keeping them on course to their goals.

UnSt 195 - Career Planning (1)
Explores and explains the career planning process by engaging students in self-assessment and career exploration activities intended to assist them in choosing a major or career.

UnSt 196 - Summer Bridge Program (3)
The Summer Bridge Program is a TRiO/Student Support Services (SSS) joint partnership with PSU. Students will strengthen and use the academic skills needed for success at the University. Students will become familiar with the campus and visit classes to better understand the rigor and expectations of college courses.

UnSt 197 - Academic Writing Support/Student Support Services (1)
The purpose of this course is to assist Student Support Services students with their academic writing. This class is designed to support students who feel unprepared with the writing demands of college or who may feel the need for additional writing support. Instructor consent required.

UnSt 198 - Roads to Success Intersession (3)
Roads to Success is an early start program for new freshmen at PSU designed to enhance student success and retention at PSU. The course will examine effective college study strategies, self-empowerment theories, differences between high school and college, goal setting and engagement at PSU.

Corequisite: UnSt 298.

UnSt 199 - Special Studies (1-8)
(Credit to be arranged.)

UnSt 210 - Sophomore Transition (4-5)
Contact department for more information on this course.

UnSt 233 - (0)
Corequisite: UnSt 233T.

UnSt 254 - (4)
Corequisite: UnSt 254V.

UnSt 298 - Roads to Success Fall Seminar (1)
Roads to Success fall seminar is a co-requisite to Roads to Success Intersession and continues the curriculum from the two-week course. Students are exposed to critical study skills, PSU resources for success and learn the important of becoming engaged members of the PSU community.

Corequisite: UnSt 198.

UnSt 299 - Selected Studies (1-4)
(Credit to be arranged.)

UnSt 310 - Transfer Transition (4-5)
Contact department for more information on this course.

UnSt 394 - College Success Topics (3)
College Success is a comprehensive course designed to enhance student success and retention. Students will learn proven strategies for creating greater academic, professional, and personal success. Students will understand self-empowerment, personal responsibility, self-motivation, interdependence, self-awareness and other critical components of keeping them on course to their goals.

UnSt 399 - Special Studies (1-8)
(Credit to be arranged.)

UnSt 401 - Research (1-4)
(Credit to be arranged.)

UnSt 402 - Independent Study (1-9)
(Credit to be arranged.)

UnSt 404 - Cooperative Ed/Internship (1-8)
(Credit to be arranged.)

UnSt 405 - Reading and Conference (1-8)
(Credit to be arranged.)

UnSt 406 - Special Projects (1-4)
(Credit to be arranged.)

UnSt 407 - Seminar (1-4)
(Credit to be arranged.)

UnSt 408 - Workshop (1-8)
(Credit to be arranged.)

UnSt 409 - Practicum (0-4)
(Credit to be arranged.)
UnSt 410 - Selected Studies (1-6)  
(Credit to be arranged.)

UnSt 411 - Inquiry Mentor (3)  
Contact department for more information on this course.

UnSt 412 - Inquiry Mentor (1-4)  
Contact department for more information on this course.

UnSt 413 - Inquiry Mentor (1-3)  
Contact department for more information on this course.

UnSt 421 - Capstone (1-6)  
The culmination of the University Studies program is the Capstone course requirement. This 6-credit, community-based learning course is designed to provide students with the opportunity to apply, in a team context, what they have learned in the major and in their other university studies courses to a real challenge emanating from the community. Interdisciplinary teams of students address these challenges and produce a summation product in a University Studies approved Capstone course under the instruction of a PSU faculty member. The Capstone’s purpose is to further enhance student learning while cultivating critical life abilities that are important both academically and professionally: establishing connections within the larger community, developing strategies for analyzing and addressing problems, and working with others trained in fields different from one’s own. Independent volunteering, work experience, by arrangement credits, internships and practica cannot fulfill the Capstone requirement. Students must have completed 90 credit hours before registering for their Capstone course. For a full description of each of the 220 Capstone courses, please visit the Capstone website at: http://capstone.unst.pdx.edu/.

UnSt 501 - Research (1-4)  
(Credit to be arranged.)

UnSt 509 - Practicum (1-4)  
(Credit to be arranged.)

USP - Urban Studies & Planning

USP 199 - Special Studies (1-4)  
(Credit to be arranged.)

USP 233 - Real Estate Principles (3)  
Surveys the legal, physical, and economic structure of the real estate market and the characteristics of real estate resources. Develops basic real estate valuation procedures and provides an overview of market analysis and real estate production, marketing and finance methods.

Prerequisite: Ec 201.

USP 299 - Special Studies (1-4)  
(Credit to be arranged.)

USP 300 - Introduction to Urban Studies (4)  
Introduction to the interdisciplinary field of urban studies drawing on the urban planning, economics, geography, sociology, politics, and the humanities to provide basic concepts for understanding the urbanized world of the twenty-first century. Cities as economic, social, and political systems and ways in which people have thought about cities.

USP 300U - Introduction to Urban Studies (4)  
Introduction to the interdisciplinary field of urban studies drawing on the urban planning, economics, geography, sociology, politics, and the humanities to provide basic concepts for understanding the urbanized world of the twenty-first century. Cities as economic, social, and political systems and ways in which people have thought about cities.

USP 301 - Introduction to Community Development (4)  
An investigation of concepts, models and perspectives of community development practice. Explores social, cultural, religious, political economic and environmental aspects that affect community development practice. Asset-based and sustainable human development models and action research are emphasized. The course utilizes teaching cases and experts from the field and requires substantial reading reflection and discussion.

USP 302 - Theory and Philosophy of Community Development (4)  
New approaches to the philosophy of community; theory and comparative practice; and case study of local theory and practice, presentation of an in-depth case study from the Pacific Northwest.

USP 311 - Introduction to Urban Planning (4)  
An interdisciplinary perspective on planning theories, principles, and practice. Focuses on the planning process, particularly at the local level. Explores the political, economic, social, and legal forces that influence the planning function and the roles of planners. Changing concepts in practice are also considered.

USP 311U - Introduction to Urban Planning (4)  
An interdisciplinary perspective on planning theories, principles, and practice. Focuses on the planning process, particularly at the local level. Explores the political, economic, social, and legal forces that influence the planning function and the roles of planners. Changing concepts in practice are also considered. Recommended prerequisite: upper-division standing.

USP 312 - Urban Housing and Development (4)  
Problems of housing, development, and redevelopment in an urban setting are analyzed from economic, demographic, and planning perspectives. Introduction to the nature of the urban economy and residential location, with a focus on housing problems and their associated social, physical, and racial aspects. Role of federal and community-based housing policies and programs.
USP 312U - Urban Housing and Development (4)

Problems of housing, development, and redevelopment in an urban setting are analyzed from economic, demographic, and planning perspectives. Introduction to the nature of the urban economy and residential location, with a focus on housing problems and their associated social, physical, and racial aspects. Role of federal and community-based housing policies and programs. Recommended prerequisite: USP 311.

USP 313 - Urban Environmental Issues (4)

Environmental issues and problems are evaluated in the urban context. The course addresses both the origins of urban environmental problems and their economic and social implications. Finding solutions that attempt to achieve balance between social, economic, and ecological factors is addressed in the context of urban environmental policy, planning and community activism.

USP 313U - Urban Environmental Issues (4)

Environmental issues and problems are evaluated in the urban context. The course addresses both the origins of urban environmental problems and their economic and social implications. Finding solutions that attempt to achieve balance between social, economic, and ecological factors is addressed in the context of urban environmental policy, planning and community activism.

USP 314 - The City in Film (4)

Critically examines urban social issues reflected in films from different countries. Course includes in-class screening, lecture and discussion, and film review writing exercises. Topics for discussion include the urban form, issues of race, gender and social class, the relationships among communities, political authority, industry, commerce, police, street gangs, criminals, public schools, and other institutions and denizens of the city. The course provides linkages to other courses in USP's undergraduate community development major and to issues related to urban studies.

USP 314U - The City in Film (4)

Critically examines urban social issues reflected in films from different countries.

USP 316 - Community Organizing and Social Change (4)

Community organizing seeks to involve people in collective action to address issues of social change and social justice. This course covers the history, philosophy and goals of community organizing and various elements of the organizing process. Case studies will provide the basics for the development of action plans.

USP 317 - Introduction to International Community Development (4)

An investigation of concepts, models, and perspectives of International Community Development practice. Explores social, cultural, religious, political, economic, and environmental aspects that affect community development practice in the Third or Developing World. Asset-based and sustainable human development models and action research are emphasized. The course utilizes teaching cases and experts from the field and requires substantial reading, reflection and discussion.

USP 317U - Introduction to International Community Development (4)

An investigation of concepts, models, and perspectives of International Community Development practice. Explores social, cultural, religious, political, economic, and environmental aspects that affect community development practice in the Third or Developing World. Asset-based and sustainable human development models and action research are emphasized. The course utilizes teaching cases and experts from the field and requires substantial reading, reflection and discussion.

USP 323 - Real Estate Development and Finance (4)

Examines urban real estate development, including location of activities within metropolitan areas, public/private partnerships, downtown redevelopment, and affordable housing. Presents tools to evaluate the financial feasibility and performance of a project, including discounting of cash flows and pro forma analysis. Uses a case study method showing how the design, development, market, finance, construction, and management of the project are integrated.

USP 323U - Real Estate Development and Finance (4)

Examines urban real estate development, including location of activities within metropolitan areas, public/private partnerships, downtown redevelopment, and affordable housing. Presents tools to evaluate the financial feasibility and performance of a project, including discounting of cash flows and pro forma analysis. Uses a case study method showing how the design, development, market, finance, construction, and management of the project are integrated.

USP 324 - Healthy Communities (4)

Addresses major issues at the intersection of urban policy and planning and individual and community health. Relationships between the ways in which land is used, the transportation choices available, and the health of both urban places and city residents is explored in light of growing concern about increased rates of various health problems. Health consequences of political, economic, and social aspects of metropolitan life are also examined. Movements and programs to create and maintain healthy communities around the world are analyzed.

USP 324U - Healthy Communities (4)

Addresses major issues at the intersection of urban policy and planning and individual and community health. Relationships between the ways in which land is used, the transportation choices available, and the health of both urban places and city residents is explored in light of growing concern about increased rates of various health problems. Health consequences of political, economic, and social aspects of metropolitan life are also examined. Movements and programs to create and maintain healthy communities around the world are analyzed.
USP 325 - Community and the Built Environment (4)

This course examines the relationships between urban form and social patterns, and efforts by urban designers to influence community life by shaping the built environment. The history of ideas about urban form and community development, and the history of proposed and implemented projects will be surveyed, and their relevance for contemporary urban planning and design practices will be assessed. Initiatives in the Portland metropolitan area to enhance community livability will be studied.

USP 325U - Community and the Built Environment (4)

This course examines the relationships between urban form and social patterns, and efforts by urban designers to influence community life by shaping the built environment. The history of ideas about urban form and community development, and the history of proposed and implemented projects will be surveyed, and their relevance for contemporary urban planning and design practices will be assessed. Initiatives in the Portland metropolitan area to enhance community livability will be studied.

USP 326 - Neighborhood Conservation and Change (4)

The dynamics of neighborhood development, including economic and institutional factors in neighborhood change; neighborhood definition and image, residential choice; residential segregation; neighborhoods in the political process; and neighborhood conservation strategies.

USP 326U - Neighborhood Conservation and Change (4)

The dynamics of neighborhood development, including economic and institutional factors in neighborhood change; neighborhood definition and image, residential choice; residential segregation; neighborhoods in the political process; and neighborhood conservation strategies.

USP 350 - Inclusive Engagement (4)

Examination of principles, methods, and programs for giving explicit attention to the perspectives of the public in the development and implementation of public policies and programs. Sets public participation in its historical context with an assessment of its impact to date. Participation from the perspective of both the public and the government will be covered as will the variety of approaches for achieving participation goals and objectives.

USP 350U - Inclusive Engagement (4)

Examination of principles, methods, and programs for giving explicit attention to the perspectives of the public in the development and implementation of public policies and programs. Sets public participation in its historical context with an assessment of its impact to date. Participation from the perspective of both the public and the government will be covered as will the variety of approaches for achieving participation goals and objectives.

USP 360 - Real Estate Finance I (4)

Application of finance and economic principles to analysis of real estate finance and investments. Emphasis on the development of problem solving capabilities through the use of computer application programs. Special attention is given to risk analysis, alternative mortgage instruments, hedging techniques, and the tax effects of real estate investment.

USP 360U - Portland Past and Present (4)

Begins with the geological/geographical foundations of Portland then briefly explores Portland's original inhabitants, early exploration and commercial growth. Particular attention is paid to the 20th century and the plans and projects that have guided Portland's development over the past 100 years. Considers the shaping of Portland as a regional city, examining the evolving cityscape, architecture, land use, and transportation, and its development from political, social, economic, and cultural perspectives.

USP 385U - History of American Cities (4)

Traces the evolution of urban centers from the colonial period to the present. Focuses on the developing system of cities, on growth within cities, and on the expansion of public responsibility for the welfare of urban residents. Particular attention is given to the industrial and modern eras. Recommended prerequisite: Hst 337. May be taken only once for credit.

USP 385U - History of American Cities (4)

Traces the evolution of urban centers from the colonial period to the present. Focuses on the developing system of cities, on growth within cities, and on the expansion of public responsibility for the welfare of urban residents. Particular attention is given to the industrial and modern eras. Recommended prerequisite: upper-division standing. Also listed as Hst 337. May be taken only once for credit.

USP 399 - Special Studies (1-6)

(Credit to be arranged.)

USP 401 - Research (0-6)

(Credit to be arranged.) Consent of instructor.

USP 402 - Independent Study (1-8)

(Credit to be arranged.)

USP 404 - Cooperative Education/Internship (0-9)

(Credit to be arranged.)

USP 405 - Reading and Conference (0-6)

(Credit to be arranged.)

USP 407U - Seminar (4)

(Credit to be arranged.)

USP 408 - Workshop (0-6)

(Credit to be arranged.)
USP 409 - Practicum (0-12)
(Credit to be arranged.) Consent of instructor.

USP 410 - Selected Topics (1-6)
(Credit to be arranged.)

USP 410U - Selected Topics (1-4)
(Credit to be arranged.)

USP 411 - Pedestrian and Bicycle Planning Lab (2)
A practical approach to bicycle and pedestrian planning and design through a project-based course that focuses on all aspects of the planning process. Students research and develop solutions to a practical challenge in the Portland region and present recommendations in report and presentation form. Also offered for graduate-level credit as USP 511 and may be taken only once for credit.

Prerequisite: Junior standing. Co-registered with USP 465 or USP 565 or have taken USP 465 or 565 within the past two years.

USP 414 - Transportation Seminar (1)
This weekly seminar features a different speaker each week covering various topics in transportation research and practice. The topics cover all modes of transportation, with a focus on current practice. Course is cross-listed course with CE. Also offered for graduate-level credit as USP 514. This course may be taken for credit up to three times.

USP 419 - Population and Society (4)
Survey and analysis of population dynamics (births, deaths, and migration) and society. Examination of demographic concepts, theories, data and measurements, and research. Role of population processes in social life and public policies are highlighted, including population aging, economic development and the environment, urbanization, health and health care, race and ethnicity, and government/social/business planning. Also offered for graduate-level credit as USP 519; this course is the same as Soc 441/541; course may only be taken once for credit.

Prerequisite: Soc 200. Crosslisted as: Soc 441.

USP 427 - Downtown Revitalization (3)
This course examines the evolution and revitalization of downtowns and main streets over time. It explores the role of downtowns in contemporary urban regions, and introduces the concepts of downtown management and other strategies for promoting vital urban centers. Through readings, field observations, classroom discussions, and a series of assignments, students will explore the interrelationships between the built environment, economic trends, and public policy in shaping the downtowns we see today. Students should learn to understand downtowns as complex and multifaceted places that are always changing and unpredictable, but often play a crucial role in a community’s identity and purpose. Also offered for graduate-level credit as USP 527 and may be taken only once for credit.

USP 428 - Concepts of Community Development (4)
An investigation of models and perspectives on community development. Both structural and dynamic concepts related to processes of community-based change will be explored, including methodological approaches for assessing community settings, and the various roles and relationships in a community-based decision environment. Includes required field observation and a substantial independent field research project which examines cases of community problem-solving.

Prerequisite: USP 301 for undergraduates. Graduate students undertake a substantial independent project in addition to other course requirements. Also offered for graduate-level credit as USP 528 and may be taken only once for credit.

USP 429 - Poverty in the Urban Community (3)
An introductory course about the nature, extent, and causes of poverty in the United States. It covers a brief historical overview, demographics and trends, explanations of poverty, and anti-poverty policies. Questions of race, gender, and the spatial manifestation of poverty will be addressed.

USP 430 - Participatory Research Methods for Community Development (4)
This course introduces students to participatory methods, placing special emphasis on research ethics, the positionality of the researcher, and embedding research within community development practice. It focuses on research design, data collection, data analysis, and the dissemination of results. Various approaches to measuring urban phenomena are covered, including basic interview techniques, survey methods, and quantitative analytical methods.

USP 431 - Urban Economics (4)
Functions of the urban economy: the market sector and the public sector. Economic analysis of issues such as land use, environmental quality, transportation, housing, income distribution, and financing of urban public services. This is the same course as Ec 431 and RE 431 may only be taken once for credit.

Prerequisite: Ec 201. Crosslisted as: Ec 431 and RE 431.

USP 438 - Real Estate Law (3)
Provides students with a comprehensive summary of real property from a legal perspective with an emphasis on transactional issues. Includes issues relating to types of ownership, descriptions of property, easements, public and private limitations on use, real estate contracts, forms utilized in transfers, financing and title assurances. The class will enable students to understand the legal framework and the rights and responsibilities of owners and transferors/transferees of real property. Also offered for graduate-level credit as USP 538: this is the same course as RE 438; may be taken only once for credit.

Prerequisite: Ec 201 (undergraduates). Expected preparation for graduate students: RE 521. . Crosslisted as: RE 438.

USP 440 - Measuring People and Communities in the Urban Context (4)
This is an applied research methods course that provides students with the essential data skills for quantitatively measuring social, economic, and demographic trends across urban places. The course provides students with an appreciation for underlying theoretical and practical research methods for identifying, measuring, and conceptualizing trends specific to urban places.

Prerequisite: upper-division standing.
USP 445 - Cities and Third World Development (3)

Critical survey of historical, economic, cultural, political, and urban aspects of Third World development, starting with the colonial era. Historical patterns of integration of the Third World with the emerging world market system. Covers problems of the post-independence period, focusing on urban sectoral issues and policy alternatives. Specific topics include trade, investment, industrialization, finance, technology transfer, political participation, land use, housing, transportation, information infrastructure, population growth, social services, militarism, and cultural conflict. This is the same course as INTL 445 and may be taken only once for credit. Also offered for graduate-level credit as USP 545 and may be taken only once for credit.

Crosslisted as: INTL 445.

USP 451 - Community Economic Development (3)

Course sets community economic development within the context of traditional state and local economic development policy and compares their underlying theoretical perspectives. It examines the impact of recent economic, social, and demographic transformations on local labor markets and surveys the labor-market problem solving activities of local governments and community-based organizations. Business and commercial development strategies are also explored. Also offered for graduate-level credit as USP 551 and may be taken only once for credit.

USP 452 - GIS for Community Development (4)

This course uses lab exercises and lectures to help students develop an in-depth understanding and basic skills for the uses of geographic information systems in community development and planning.

Prerequisite: upper-division standing.

USP 455 - Land Use: Legal Aspects (3)

Land use and planning from the legal perspective. Includes historical review of attitudes toward property tenure and ownership; the relationship between local planning and regulations; and current issues and perspectives on land use including emerging state and federal roles. Graduate students undertake a substantial independent project in addition to other requirements. Also offered for graduate-level credit as USP 555 and may be taken only once for credit.

USP 456 - Urban Transportation: Problems and Policies (3)

An introduction to urban transportation policy from a historical and political perspective. Historical developments in transportation policy are traced from the early streetcar days up through the present. Federal, state, and local transportation policies are examined for their impact on urban spatial and economic development. An overview of current issues in transportation policy and planning includes transportation demand management strategies, transit-oriented design, road pricing, and alternative transportation modes. The intersection of environmental and transportation policy is also examined, as is the decision-making structure at the local, regional, and state level. Also offered for graduate-level credit as USP 556 and may be taken only once for credit.

USP 457 - Information Cities (3)

Focuses on the political, social, and cultural impacts of mass media and information technologies within the urban matrix. Contextualizes the “information society” in historical, institutional, political, economic, and global settings. Topics include the flexible production, the segmentation of consumption, alternatives to mass media, the Web, the reorganization of work, the transnationalization of culture, commercial and political surveillance, and the development of urban information infrastructure. Also offered for graduate-level credit as USP 557 and may be taken only once for credit.

USP 460 - Community Development Field Seminar (6)

Participant observation through placement in a community-based organization actively engaged in community development activities on behalf of a specific community, and critical reflection on the placement experience.

Prerequisite: completion of the Community Development Core and at least one course or an equivalent from among those listed in Methods in Community Development.

USP 465 - Pedestrian and Bicycle Planning (3)

Examines the importance of walking and bicycling as means of transportation in a sustainable urban environment. Covers planning, design, implementation, and maintenance of bikeways and walkways, as well as ancillary facilities such as bicycle parking. Focus on the role of education, advocacy, and outreach in improving walking and bicycling conditions. Study relevant examples from various cities, with a heavy emphasis on Portland’s experience. Also offered for graduate-level credit as USP 565 and may be taken only once for credit.

USP 468 - Oregon Land Use Law (3)

The Oregon program is placed in a national context that stresses the broad nature of planning here. Structural relations between state, regional, and local government planning and regulation are analyzed. Legal aspects of the implementation of the various functional statewide planning goals are studied, as are the Oregon Land Use Board of Appeals and recent developments in local government land use planning and regulatory processes. Also offered for graduate-level credit as USP 568 and may be taken only once for credit.

USP 475 - Urban Design Workshop (4)

The workshop will explore the use of urban design as an integral part of the planning process through the creation of an urban design plan. Projects in the Portland region will be chosen to familiarize students with the practice of urban design planning and the products of the workshop will be presented to the public. Also offered for graduate-level credit as USP 575 and may be taken only once for credit.

Prerequisite: Enrollment in good standing in the MARCH or MURP graduate degree programs or permission of the instructor.

USP 480 - Political Economy of Nonprofit Organizations (3)

Considers theories of altruism, trust, and social capital. Examines the connections between wealth and social responsibility and between elite status and social reproduction. Explores the broad scope of nonprofit activity in the economy, the
interdependence of government and nonprofit organizations in the modern state, and the role of think tanks in shaping public policy. Surveys the dramatic rise of non-governmental organizations in developing countries and the future of nonprofits in a global economy. Also offered for graduate-level credit as USP 580 and may be taken only once for credit.

**USP 490 - Green Economics and Sustainable Development (3)**
Examines prevailing assumptions about economic growth, production, consumption, labor, and leisure. Considers how changes in these basic assumptions might help us design an economic system that includes alternative values such as appropriate scale, community impact and environmental sustainability. Also offered for graduate-level credit as USP 590 and may be taken only once for credit.

**USP 493 - Public Participation GIS (3)**
Offered as a studio-based GIS class. The objective is for students to apply GIS skills acquired in previous GIS courses to a specific real-world spatial problem. Tasks will involve problem definition, primary data collection, advanced GIS analysis, and presentation of results. This format will give students practical experience in implementing GIS technologies with specific emphasis on planning problems. Students will be required to work in small groups in a simulated professional planning practice environment. Also offered for graduate-level credit as USP 593 and may be taken only once for credit. Expected preparation: USP 531 and USP 543 or USP 591 and USP 592.

**USP 496 - Affordable Housing Finance (3)**
Introduction to the unique challenges of financing and developing affordable housing projects. The challenges and tools for financing rental as well as owner-occupied housing will be covered, and case studies will be used to illustrate the ways in which financing for affordable housing is created and used, and poses unique challenges for investors, jurisdictions, and community-based groups. Also offered for graduate-level credit as USP 596 and may be taken only once for credit. Expected preparation: USP 312.

**USP 498 - Introduction to Finance and Real Estate (3)**
Designed for students seeking the graduate certificate in real estate development who have little or no business education, or for those students who desire a course in basic finance and real estate concepts and techniques. Introduces business finance within the context of commercial real estate. Concepts and techniques will include financial statements, analysis, and forecasting; present value and discounted cash flow analysis, an introduction to real estate valuation measurements; and analysis of performance risk versus return. Students also receive an overview of the legal definitions of real estate and its forms of ownership, as well as an overview of real estate title, contract, regulation, and financing issues. Recommended prerequisites: Ec 201 and 202.

**USP 499 - Real Estate Finance and Investments (3)**
Application of finance and economic principles to analysis of real estate finance and investments. Emphasis on the development of problem solving capabilities through the use of computer application programs. Special attention is given to risk analysis, alternative mortgage instruments, hedging techniques, and the tax effects of real estate investment.

**USP 501 - Research (0-9)**
(Credit to be arranged.) Consent of instructor.

**USP 502 - Independent Study (1-9)**
(Credit to be arranged.)

**USP 503 - Thesis (0-9)**
(Credit to be arranged.)

**USP 504 - Cooperative Education/Internship (1-9)**
(Credit to be arranged.)

**USP 505 - Reading and Conference (0-6)**
(Credit to be arranged.)

**USP 506 - Projects (1-9)**
(Credit to be arranged.)

**USP 507 - Seminar (1-6)**
(Credit to be arranged.)

**USP 508 - Workshop (0-6)**
(Credit to be arranged.)

**USP 509 - Practicum (0-9)**
(Credit to be arranged.) Consent of instructor.

**USP 510 - Selected Topics (0-6)**
(Credit to be arranged.)

**USP 511 - Pedestrian and Bicycle Planning Lab (2)**
A practical approach to bicycle and pedestrian planning and design through a project-based course that focuses on all aspects of the planning process. Students research and develop solutions to a practical challenge in the Portland region and present recommendations in report and presentation form. Also offered for undergraduate-level credit as USP 411 and may be taken only once for credit.

Prerequisite: junior standing. Co-registered with USP 465 or USP 565 or have taken USP 465 or 565 within the past two years.

**USP 512 - Environmental Planning Methods (3)**
Examination of the patterns and processes in human-dominated landscapes, and the tools for understanding human behavior and decision making. By applying several environmental planning tools to managing landscapes, this course aims to provide students with skills to translate data into information. Topics covered include, land conservation, impact of land use on watersheds, sustainability design, environmental impact assessments, and environmental modeling and simulation. Focus is on the application of tools to addressing pressing problems of regional significance. Recommended prerequisites: USP 531 or Geog 488/588.

**USP 513 - Introduction to Landscape Architecture (3)**
An introduction to the history, theory and methods of landscape architecture. Course materials to include key readings from the field, case studies, and hands-on exposure to the thought processes underlying the work of landscape architects.

**USP 514 - Transportation Seminar (1)**
This weekly seminar features a different speaker each week covering various topics in
transportation research and practice. The topics cover all modes of transportation, with a focus on current practice. Course is cross-listed course with CE. Also offered for undergraduate-level credit as USP 414. This course may be taken for credit up to three times.

**USP 515 - Economics: Applications in Urban Studies (4)**

Microeconomic analysis of individual and firm behavior is developed with emphasis on applications to urban studies. Topics which may be covered include: land use and land rents, urban structure, poverty, housing and slums, transportation, environmental quality, and local government finance.

**USP 517 - Urban Economic Development Policy (3)**

This course analyzes urban economic development policy by building on an overall framework that demonstrates how urban economies create and distribute wealth and affect citizens’ quality of life. Federal, state, and local policies must pursue three broad objectives: 1. raising the area’s standard of living; 2. preserving and protecting environmental quality and quality-of-life; 3. reducing poverty and income inequality. This course provides students the ability to analyze and assess alternative policies through an understanding of the theoretical foundations of urban growth and decline; through the ability to apply analytical methods for assessing policy effectiveness; by examination of evidence of policy effectiveness; by reviewing case studies; and via a student’s personal research of specific urban problems.

Prerequisite: USP 515 or equivalent courses in economics.

**USP 518 - Energy and Society (3)**

Consideration of the role of energy in human society, including energy and social change, energy and urban form, technologies of energy supply and demand, social institutions governing access to energy, and cultures of consumption. Current social issues involving energy efficiency, renewable energy technologies and climate change are stressed.

**USP 519 - Population and Society (4)**

Survey and analysis of population dynamics (births, deaths, and migration) and society. Examination of demographic concepts, theories, data and measurements, and research. Role of population processes in social life and public policies are highlighted, including population aging, economic development and the environment, urbanization, health and health care, race and ethnicity, and government/social/business planning. Also offered for undergraduate-level credit as USP 419; this course is the same as Soc 441/541; course may only be taken once for credit.

Prerequisite: Soc 200. Crosslisted as: Soc 541.

**USP 520 - Applied Demographic Methods I (4)**

The first of a two-course sequence. The purpose is to introduce the various basic methods of demographic analysis. The topics to be covered include data sources, population characteristics and change, and measures of mortality and fertility. In addition, the course will help students develop good judgment about data availability and quality, and acquire skills for presenting data. Recommended prerequisite: a course in regression analysis, such as USP 534.

**USP 521 - Applied Demographic Methods II (4)**

The second of a two-course sequence. The purpose is to introduce more advanced methods of applied demographic analysis. The topics to be covered are: data sources, internal and international migration, data evaluation, population estimates, and projection projections. The course will consist of readings, lectures, laboratory sessions, homework exercises, one examination, and one term-long project.

**USP 522 - Practicum in Applied Demography (4)**

Represents the capstone course for the graduate concentration in applied demography. The focus is on integrating a practicum experience with the methods of applied demography into a research paper. Students will develop, revise, and resubmit numerous drafts of a final research paper. Students will also provide professional peer review in evaluating the development of fellow student research papers.

**USP 523 - Real Estate Development I (4)**

Evaluates the new public/private partnerships that are necessary for downtown redevelopment, historic rehabilitation, integrated mixed-use urban centers, urban villages, and new communities. Students will analyze the critical conceptual, feasibility, and deal-making phases of the development process, as well as the development and management stages. The course examines the new affirmative roles played by both public and private developers, as well as unusual joint development entities. Also considered are innovative concepts of incremental growth, land and development banking, shared parking, and alternative development patterns. Expected preparation: USP 515 or Fin 598 (may be taken concurrently).

**USP 524 - Site Planning (3)**

This course introduces the fundamentals of site planning in an urban context, as well as contemporary urban design theory and practice. Students will learn the principles of site planning and urban design at the scale of urban centers and specific sites, as well as the synthesis of multiple design decisions made by different actors, at different times, about different properties. The course will explore these topics from various perspectives, including planners and designers, developers and regulators, and others. Slideshow lectures, downtown walking tours, and a term project will use Portland as a living laboratory for how the principles of urban design and site planning are played out in public and private development projects. Students will work in teams to apply class principles to a specific site that is currently slated for redevelopment.

**USP 525 - Design Analysis in Planning (2)**

Approaches to the analysis of design issues in urban planning. The definition of urban space through mass, rhythm, and scale. Design and urban circulation. Planning tools for the implementation of design goals.

**USP 526 - Neighborhood Conservation and Change (4)**

The dynamics of neighborhood development, including economic and institutional factors in neighborhood change; neighborhood definition and image,
residential choice; residential segregation; neighborhoods in the political process; and neighborhood conservation strategies. Recommended prerequisite: junior standing. Graduate students undertake a substantial independent project in addition to other course requirements.

**USP 527 - Downtown Revitalization (3)**

This course examines the evolution and revitalization of downtowns and main streets over time. It explores the role of downtowns in contemporary urban regions, and introduces the concepts of downtown management and other strategies for promoting vital urban centers. Through readings, field observations, classroom discussions, and a series of assignments, students will explore the interrelationships between the built environment, economic trends, and public policy in shaping the downtowns we see today. Students should learn to understand downtowns as complex and multifaceted places that are always changing and unpredictable, but often play a crucial role in a community’s identity and purpose. Also offered for undergraduate-level credit as USP 427 and may be taken only once for credit.

**USP 528 - Concepts of Community Development (3)**

An investigation of models and perspectives on community development. Both structural and dynamic concepts related to processes of community-based change will be explored, including methodological approaches for assessing community settings, and the various roles and relationships in a community-based decision environment. Includes required field observation and a substantial independent field research project which examines cases of community problem-solving.

Prerequisite: USP 301 for undergraduates. Graduate students undertake a substantial independent project in addition to other course requirements. Also offered for undergraduate-level credit as USP 428 and may be taken only once for credit.

**USP 529 - Green Buildings I (3)**

Reviews development of new real estate properties and communities with attention to environmental sustainability, reduced operating costs, and enhanced residential and working environmental conditions. Topics include green building standards and techniques for assessing project success.

**USP 530L - Research Design Lab (0)**

Research design lab.

Corequisite: USP 530.

**USP 531 - Geographic Information Systems (GIS) for Planners (4)**

Introduction to principles and methods of collecting, organizing, analyzing, and visualizing geographic information. Explores types and sources of geographical data used in urban and regional studies and planning with an emphasis on Census data. Provides an overview of principles and components of Geographic Information Systems (GIS) as a primary tool of spatial data analysis and visualization. Attention is given to practical applications of GIS and to developing essential skills in desktop mapping and spreadsheet software.

**USP 532 - Data Collection (4)**

The acquisition of data for research in an urban context. Emphasis is on the concepts, terminology, and methods related to the use of survey research and secondary data. Recommended prerequisite: USP 430 and/or an introductory undergraduate statistics sequence and USP 530.

**USP 533 - Planning Methodsl (4)**

Introduction to applied research in planning with emphasis on problem definition, planning and policy research design, collection and analysis for secondary data, and the use of qualitative observations.

Prerequisite: undergraduate statistics course.

**USP 534L - Data Analysis Lab (0)**

Data analysis lab.

Corequisite: USP 534.

**USP 535 - Planning Methods II (4)**

Continuation of USP 533 focusing on statistics, forecasting, interpretation, and presentation of data in the context of planning practice.

Prerequisite: USP 533.

**USP 536 - Policy Evaluation Methods (3)**

Focuses on the methodological issues that must be addressed in attempting to evaluate programs and policies. Course offers an introduction to a variety of techniques useful in policy evaluation. Topics which may be covered include difference equations, Markov models, and queuing models. A section of the course considers the methodological issues that arise in cost-benefit analysis, such as present value calculations, determining the value of non-market benefits, and correctly evaluating costs. Recommended prerequisite: USP 515 or equivalent.

**USP 537 - Economics of Urban Transportation (3)**

The transportation system is critical to the functioning of an urban area. The movement of people and goods affects both the productivity and livability of the region. Transportation systems also affect and are affected by land use and location decisions. This course presents the economic analysis of urban transportation. This will include analysis of the effects of transportation systems on land use and location as well as the evaluation of transportation investments. These methods will then be applied to evaluation of various proposals to improve the urban transportation system. Recommended prerequisite: USP 515 or 615.

**USP 538 - Real Estate Law (3)**

Provides students with a comprehensive summary of real property from a legal perspective with an emphasis on transactional issues. Includes issues relating to types of ownership, descriptions of property, easements, public and private limitations on use, real estate contracts, forms utilized in transfers, financing and title assurances. The class will enable students to understand the legal framework and the rights and responsibilities of owners and transferors/transfereses of real property. Also offered for undergraduate-level credit as USP 438: this is the same course as RE 538; may be taken only once for credit. Expected preparation for graduate students: RE 521.

Crosslisted as: RE 538S.

**USP 539 - Statistical Methods in Regional Science and Planning (2)**

Demonstrates the application of statistical methods to problems in the fields of regional science, transportation, and land use planning. Material is organized to provide a general description of a statistical technique and related set of applications. Data sets
used in the actual applications are also provided to students, allowing them to replicate or recast the analysis. Methods covered include correlation, multiple regression, multivariate regression, time series analysis, and limited dependent variable techniques.

**USP 540 - History and Theory of Planning (4)**
The evolution of the urban planning field from its 19th century European origins through the 20th century U.S. history. Course addresses the question: why do we produce and implement plans? Specific topics include: philosophical issues and political-organization contexts of professional activity; the place of planning in the political economy of U.S. metropolitan development; and problems of rationality in forecasting, analysis, decision making, and design.

**USP 541 - Dynamics of Planning Practice (3)**
Examination of principles, methods, and programs for giving explicit attention to the perspectives of citizens in the development and implementation of public policies, programs and planning. Sets citizen participation in its historical context with an assessment of its impact to date. Examines issues pertaining to working with diverse communities and highlights ethical dilemmas faced by professional planners.

**USP 542 - Land Use Implementation (3)**
An examination of alternative approaches to implementation of plans. Topics include: regulatory tools, e.g., zoning and subdivision ordinances; review functions, e.g., design review and administrative review; and programs, e.g., growth management, capital improvements, community development, housing assistance plans; and political-procedural issues, e.g., permit streamlining, cost impacts.

**USP 543 - Geographic Applications to Planning (4)**
Principles and models of spatial organization, behavior, and location in geographic space. Major conceptual models of urban structure and form, urban regional hierarchy, transportation flows and other forms of spatial interaction, and their applications to modern planning and other disciplines. Spatial data models (rasters, TINs, LRSs, other) and advanced analytical and modeling capabilities of GIS (surface, 3-D, and network analyses). Discussion of real-life GIS applications to transportation, land use, environmental planning, community development, and related areas.

**USP 544 - Urban Transportation Planning (3)**
Introduces fundamental concepts and methods used in multi-modal urban transportation planning, including problem identification, alternatives analysis, evaluation and decision making, plan implementation, and program management. Exposes students to processes and analytical methods from multiple disciplines, such as law, politics, engineering, sociology, economics, finance, management and marketing. Emphasis on analysis of moderately complex technical information and its interpretation for communication with decision makers.

Prerequisite: USP 535 or equivalent coursework in descriptive and inferential statistics and data presentation. Recommended: USP 515 or USP 537 or an equivalent intermediate-level course in applied microeconomics.

**USP 545 - Cities and Third World Development (3)**
Critical survey of historical, economic, cultural, political, and urban aspects of Third World development, starting with the colonial era. Historical patterns of integration of the Third World with the emerging world market system. Covers problems of the post-independence period, focusing on urban sectoral issues and policy alternatives. Specific topics include trade, investment, industrialization, finance, technology transfer, political participation, land use, housing, transportation, information infrastructure, population growth, social services, militarism, and cultural conflict. Also offered for undergraduate-level credit as USP 445 and may be taken only once for credit.

**USP 546 - Real Estate Development II (4)**
Provides students the experience of developing a comprehensive and unified analysis of a commercial real estate project. Each student will submit a case study with greater specificity showing how the design, development, market, finance, construction, and management of the project are integrated. A select number of projects in the greater Portland area will be analyzed as case studies. Students will work closely with industry participants and faculty to develop their analysis as well as alternative strategies for the project at critical stages of its development.

Prerequisite: USP 523.

**USP 547 - Urbanization and Planning in the Global South (3)**
Urban planning interventions in many cities in the Global South have been facing big challenges as rapid population growth has led to resource scarcity, environmental degradation, and social inequality. This course develops tools and ideas to understand issues confronting cities in diverse socio-economic, political, and cultural circumstances, and how globalization impacts the local space of cities and regions. It focuses on challenges and opportunities in formulating appropriate planning interventions, and prepares planners to work in the diverse and rapidly changing contexts of the Global South.

**USP 549 - Regional Planning and Metropolitan Growth Management (3)**
Explores regional planning in the U.S. today through an examination of historical and contemporary regional planning practice. Begins with an overview of the history of regional planning, including the evolution of thought regarding regionalism and the nature of regions. Examples of regional plans will be used as the basis for examining assumptions, approaches, and methods serving as the foundation for regional planning practice. A synthesis of the findings of the review of plans will be used to draw general conclusions about the field and its prospects. Pays particular attention to the principles, approaches, and methods of growth management generally and with respect to metropolitan regions.

**USP 550 - Participatory Planning (3)**
Examines the principles and methods for creating participatory planning. Demonstrates the linkage between frameworks and concepts such as collaborative planning, deliberative democracy, equity planning, and the co-production of plans and applied work. Considers various processes, techniques, and tools to foster equitable community
engagement. Students design a participatory process for clients.

**USP 551 - Community Economic Development (3)**

Course sets community economic development within the context of traditional state and local economic development policy and compares their underlying theoretical perspectives. It examines the impact of recent economic, social, and demographic transformations on local labor markets and surveys the labor-market problem solving activities of local governments and community-based organizations. Business and commercial development strategies are also explored. Also offered for undergraduate-level credit as USP 451 and may be taken only once for credit.

**USP 552 - Urban Poverty in Critical Perspective (3)**

Examines historical, empirical, and theoretical perspectives on urban poverty in the United States. It addresses the politics of poverty discourse by examining why explanations and policy prescriptions have emphasized morality and behavior; race, family, and culture; and dependency and responsibility rather than systemic economic inequality.

**USP 553 - Legal Processes in Urban Planning (1)**

Covers the legal context within which land use planning and plan implementation takes place at the local level. Requirements for the conduct of hearings, appeals, and evidentiary processes are analyzed; skills for and techniques of writing findings and conditions of approval are developed; and questions of ordinance interpretation and liability are discussed.

**USP 555 - Land Use: Legal Aspects (3)**

Land use and planning from the legal perspective. Includes historical review of attitudes toward property tenure and ownership; the relationship between local planning and regulations; and current issues and perspectives on land use including emerging state and federal roles. Graduate students undertake a substantial independent project in addition to other requirements. Also offered for undergraduate-level credit as USP 455 and may be taken only once for credit.

**USP 556 - Urban Transportation: Problems and Policies (3)**

An introduction to urban transportation policy from a historical and political perspective. Historical developments in transportation policy are traced from the early streetcar days up through the present. Federal, state, and local transportation policies are examined for their impact on urban spatial and economic development. An overview of current issues in transportation policy and planning includes transportation demand management strategies, transit-oriented design, road pricing, and alternative transportation modes. The intersection of environmental and transportation policy is also examined, as is the decision-making structure at the local, regional, and state level. Also offered for undergraduate-level credit as USP 456 and may be taken only once for credit.

**USP 557 - Information Cities (3)**

Focuses on the political, social, and cultural impacts of mass media and information technologies within the urban matrix. Contextualizes the "information society" in historical, institutional, political, economic, and global settings. Topics include the flexible production, the segmentation of consumption, alternatives to mass media, the Web, the reorganization of work, the transnationalization of culture, commercial and political surveillance, and the development of urban information infrastructure. Also offered for undergraduate-level credit as USP 457 and may be taken only once for credit.

**USP 558 - Planning Workshop (3-6)**

Organized team approach to a current planning problem in the Portland metropolitan area. Focus on planning practice, field investigation, data analysis, written and oral communication. Work program includes strategies, methods, and skills needed to identify issues and draw together all participants in the search for solutions. Emphasis is on the blending of practical skills with knowledge gained from core-area courses. Two-term sequence, credit for first term dependent upon successful completion of the second term.

**USP 559 - Internship Seminar (1)**

A 400-hour internship, or combination of internships, is required for completion of the MURP degree. This Seminar serves as a means for graduate students admitted to the MURP degree program to share information regarding securing internships and the work products associated with internship experiences. An annual calendar for the seminar will be posted at the beginning of the year. Attendance at scheduled seminar meetings is required for all MURP candidates during the first two years of their enrollment in the program.

**USP 562 - Real Estate Development Workshop (3)**

Students form a real estate development team and produce an original development plan, including the development concept, the market analysis, the conceptual design, economic analysis, capital and operations budget, and management plan. The student’s plan will demonstrate and apply mastery of the development concepts and tools learned through the previous courses. Prerequisite: USP 523 or instructor’s consent. Course may be taken twice for credit with instructor’s consent.

**USP 563 - Real Estate Construction (3)**

Reviews the nature and characteristics of the real estate construction process, including materials, cost estimating procedures, budgets, schedules and legal procedures. Emphasis on the selection of building systems and review of the forms of construction contracts and associated documents commonly used in the industry. Reviews lessons learned from case studies. Prerequisite: RE 521.

**USP 564 - Political and Administrative Issues in Aging (3)**

Coverage of organizational dynamics as related to the elderly including the provision and use of services. Covers voting behavior and advocacy as well as administrative and legal issues that are particularly applicable to the elderly.

**USP 565 - Pedestrian and Bicycle Planning (3)**

Examines the importance of walking and bicycling as means of transportation in a sustainable urban environment. Covers planning, design, implementation, and maintenance of bikeways and walkways, as well as ancillary facilities such as bicycle parking. Focus on the role of education,
advocacy, and outreach in improving walking and bicycling conditions. Study relevant examples from various cities, with a heavy emphasis on Portland’s experience. Also offered for undergraduate-level credit as USP 465 and may be taken only once for credit.

USP 566 - National Urban Policy (3)
Examination of the federal government’s involvement with urban issues from a historical and political perspective. Focus on policies pertaining to social welfare and economic development, with an overview of other policy arenas such as housing, health, and education. Critical analysis of how and why the federal government responds to urban crises with national policy initiatives and how changes in political regime correspond with changes in policy emphases and perspectives.

USP 567 - Urban Housing Policies (3)
Review of the history and the role of public policy in the housing sector. Study of past and current trends in the delivery of housing services in urban areas. The basic philosophies related to the supply of housing are analyzed and examined relative to current trends in the delivery of housing services in urban areas. Critical review of the role of the federal government and the construction industry. Equal attention to the role of public housing and the impact of urban renewal. Active participation in discussion and a research paper are required.

USP 568 - Oregon Land Use Law (3)
The Oregon program is placed in a national context that stresses the broad nature of planning here. Structural relations between state, regional, and local government planning and regulation are analyzed. Legal aspects of the implementation of the various functional statewide planning goals are studied, as are the Oregon Land Use Board of Appeals and recent developments in local government land use planning and regulatory processes. Also offered for undergraduate-level credit as USP 468 and may be taken only once for credit.

USP 569 - Sustainable Cities and Regions (4)
Explores the questions of whether and how cities can be sustainable -- and how they can continue as places that sustain cultures, economics, and nature. Basic technological and theoretical models of human-nature interaction will be considered, along with visionary possibilities for the future of cities and urban regions, globally and in Portland.

USP 570 - Transportation and Land Use (3)
Analysis of transportation and land use interactions in urban areas. The impact of highway and transit changes on travel behavior, locational decisions, and urban form are examined. Recommended prerequisites: USP 515 and 544.

USP 571 - Environmental Policy (3)
Surveys federal, state, and international environmental policy-making with an emphasis on process design. Political and technical objectives for policy, the roles and responsibilities of institutions, federal-state tensions, representation and analysis of stakeholding interests, the role of the media, and environmental justice are key elements. Topical areas include issues concerning resource management as well as pollution prevention.

USP 572 - Regional Economic Development (3)
This course focuses on methods of analyzing why regions differ economically, how they interrelate, and why and how they react to changes in economic policies and conditions. Part of the course will be devoted to a study of models of regional structure and growth, such as economic base or input-output, and the strengths and weaknesses of each in modeling the regional economy. The remainder of the course will be concerned with the development of models for use in regional forecasting and/or evaluation of policy changes on regional development. Recommended prerequisite: USP 515.

USP 573 - Housing Economics (4)
Looks at the economics of real estate and housing, including land rent, interest rates, apartment rents, and housing prices, using an economic framework. Basic concepts in urban economics such as land rents, externalities, and public goods are reviewed. Explores the technique most commonly used in real estate and housing economics: hedonic pricing. Explores the rationale and impact of government intervention in the private real estate market. This is the same course as RE 573 and may be taken only once for credit. Expected preparation: USP 515 or Fin 521.

USP 574 - Socio-Technical Change in the City (4)
The workshop will explore the use of urban design as an integral part of the planning process through the creation of an urban design plan. Projects in the Portland region will be chosen to familiarize students with the practice of urban design planning and the products of the workshop will be presented to the public. Also offered for undergraduate-level credit as USP 475 and may be taken only once for credit.

Prerequisite: Enrollment in good standing in the MARCH or MURP graduate degree programs or permission of the instructor.

USP 575 - Urban Design Workshop (4)
Introduction to historical and contemporary efforts to foster more just and sustainable urban food systems. Integrates critical social science perspectives, applied planning literature, case studies, and analysis of policy and planning best practices.

USP 576 - Feeding the City (4)
An accelerated survey of principles, concepts, and techniques employed in the management of urban environmental problems, with particular emphasis on “best practice” and emerging ideas. Selected topics may include: watershed stewardship, brownfield development, green spaces, protection of urban wildlife, stormwater management, urban agriculture, residential toxics.

USP 577 - Urban Environmental Management (3)
Empirical techniques employed in measuring the impacts associated with land use change. Topics: goals achievement matrix approaches to impact assessment, trade-offs between community and regional welfare, distance and time in urban analysis,
USP 579 - State and Local Public Finance (3)
The course will focus on the tax burdens, fiscal resources, and expenditure patterns of local governments in metropolitan areas. The impact of revenue sharing and categorical grants will be discussed in relation to state and federal influence on local government finance. The spatial distribution of local government services, transfer payments, and tax burdens will be analyzed. Special attention will be paid to Oregon’s complex property tax limitations.
Prerequisite: USP 515.

USP 580 - Political Economy of Nonprofit Organizations (3)
Considers theories of altruism, trust, and social capital. Examines the connections between wealth and social responsibility and between elite status and social reproduction. Explores the broad scope of nonprofit activity in the economy, the interdependence of government and nonprofit organizations in the modern state, and the role of think tanks in shaping public policy. Surveys the dramatic rise of non-governmental organizations in developing countries and the future of nonprofits in a global economy. Also offered for undergraduate-level credit as USP 480 and may be taken only once for credit.

USP 581 - Environmental Psychology (3)
Examination of the relationship between people and their physical environments. Specific topics include human spatial behavior (personal space and territoriality), the contribution of the behavioral sciences to architectural and urban design, community and neighboring in the city, and environmental cognition.

USP 582 - Sustainable Transportation (3)
This course covers the sustainability dimensions of transportation, considering historical trends and future prospects. Topics covered in the course include energy use and alternative energy sources, technological change, traffic safety, vehicle emissions, environmental justice, the role of transportation in the economy, and the role of land use and urban design.
Prerequisite: graduate standing.

USP 583 - Transportation Finance (3)
Much of the current funding for roads, transit, and freight comes from fuel taxes; but increasing fuel efficiency of vehicles and the use of alternative energy sources raise questions about the long-term viability of this revenue source. This course will existing transportation finance and examine some of the proposals for alternative financing mechanisms.

USP 584 - Negotiation in the Public Sector (4)
Overview of conventional and innovative applications of negotiations in public sector activities, and the potential and limitations of negotiation-based approaches to public decision making. Key components include negotiation theory, individual skill development, and a review of the institutional, legal, and political context of negotiations.

USP 585 - Housing and Environments for the Elderly (3)
The urban environment as a physical and social context for the diverse lifestyles of its elderly residents. Theoretical approaches to aging and the environment; perception and impact of living environments on older adults. Specific topics include housing and services alternatives, issues in developing, regulating, and managing housing for the elderly, and housing design.

USP 586 - Urban Social Networks (3)
Analysis of the social psychological and anthropological literature on social networks: the structure and content of interpersonal networks (including kinship, friendship, instrumental) in an urban setting. Specific topics will include: the nature of interpersonal ties in the city, urban migration and networks, access to urban resources, methods of analyzing personal and group networks.

USP 587 - Travel Demand Modeling (3)
Understand, analyze, and apply travel demand forecasting models from an applied and practical perspective. The underlying theoretical basis of model components will also be covered. Student will become familiar with the traditional four-step travel forecasting process, including model application software package, and interpretation of model output. Involves hands-on use of transportation modeling software.
Prerequisite: an introductory course in urban transportation planning or professional experience in urban transportation planning; familiarity with spreadsheet software; college-level algebra; and introductory statistics (i.e., regression analysis). Prior experience with DOS is helpful but not mandatory.

USP 588 - Sustainable Development Practices (3)
Introduction to analytic and management approaches intended to limit the social and environmental harms associated with past patterns of development. Builds upon basic understanding of socio-environmental change and provides a foundation for subsequent indepth studies of particular sustainable development strategies and analytic techniques. Students study a broader range of sustainable development topics, tools, and techniques.

USP 589 - Theorizing Urban Natures (4)
This seminar examines various ways of understanding urban "nature". Students will contrast dominant ecological frameworks with those used in the social sciences (e.g., urban political ecology, actor-network theory), with attention to the social, political, and economic contexts in which they arose, and implications of each for research, practice, and politics.

USP 590 - Green Economics and Sustainable Development (3)
Examines prevailing assumptions about economic growth, production, consumption, labor, and leisure. Considers how changes in these basic assumptions might help us design an economic system that includes alternative values such as appropriate scale, community impact and environmental sustainability. Also offered for
undergraduate-level credit as USP 490 and may be taken only once for credit.

USP 591 - Geographic Information Systems I: Introduction (4)

The use of computers in Geographic Information Systems (GIS) and mapping. Includes theory of databases related to geographic information management and practical aspects of database design. Students will use a variety of programs for mapping and spatial analysis of geographic information. Each student completes a series of exercises demonstrating a variety of approaches to the analysis and display of spatial data. Students enrolling in this class must register for a computer lab section. This is the same course as Geog 588 and may be taken only once for credit. Expected preparation: Geog 380 or equivalent experience in cartography.

Corequisite: Geog 588L. Crosslisted as: Geog 588.

USP 592 - Geographic Information Systems II: Applications (4)

Analysis and applications of geographic information systems concepts and technology to land planning and management issues. The multipurpose land information systems concept is used as an organizing device for spatial registration of data layers to achieve data sharing and compatibility among functions. User needs assessment and systems design provides the basis for systems procurement, implementation, and use. Expected preparation: Geog 488/588 or USP 591. Students enrolling in this class must register for a computer lab section. This is the same course as Geog 592 and may be taken only once for credit.

Corequisite: Geog 592L. Crosslisted as: Geog 592.

USP 593 - Public Participation GIS (3)

Offered as a studio-based GIS class. The objective is for students to apply GIS skills acquired in previous GIS courses to a specific real-world spatial problem. Tasks will involve problem definition, primary data collection, advanced GIS analysis, and presentation of results. This format will give students practical experience in implementing GIS technologies with specific emphasis on planning problems. Students will be required to work in small groups in a simulated professional planning practice environment. Also offered for undergraduate-level credit as USP 495 and may be taken only once for credit. Expected preparation: USP 531 and USP 543 or USP 591 and USP 592.

USP 594 - Planning in the Pacific Northwest (3)

This course will utilize the work of Pacific Northwest historians, writers, critics, and others as a vehicle for equipping planners with a somewhat systematic and certainly eclectic cultural overview of the region they hope to serve. This course will attempt to prepare them to be members of a place and of a culture of place, and to embrace the art and literature of the Pacific Northwest as part of their ongoing professional development. Though focused on the Pacific Northwest, the general approach used in this course should be applicable to other regions as well.

USP 595 - Reshaping the Metropolis (3)

Examination of the contrast between classic models of metropolitan settlement and new patterns emerging in the late twentieth century. Land use changes in the context of new patterns of economic activity; ideas about the physical form of the good city and the societal implications of development patterns; issues of residential choice, community change, globalization, and environmental protection as affected by metropolitan growth.

USP 596 - Affordable Housing Finance (3)

Introduction to the unique challenges of financing and developing affordable housing projects. The challenges and tools for financing rental as well as owner-occupied housing will be covered, and case studies will be used to illustrate the ways in which financing for affordable housing is created and used, and poses unique challenges for investors, jurisdictions, and community-based groups. Also offered for undergraduate-level credit as USP 496 and may be taken only once for credit. Expected preparation: USP 312.

USP 601 - Research (0-9)

(Credit to be arranged.)

USP 602 - Independent Study (1-9)

(Credit to be arranged.)

USP 603 - Dissertation (0-15)

(Credit to be arranged.)

USP 605 - Reading and Conference (0-9)

(Credit to be arranged.)

USP 606 - Project (1-9)

(Credit to be arranged.)

USP 607 - Seminar (1-9)

(Credit to be arranged.)

USP 609 - Practicum (1-9)

(Credit to be arranged.)

USP 610 - Selected Topics (0-9)

(Credit to be arranged.)

USP 612 - Community, Planning, and Ethics (4)

Introduction to the history and theory of community development in North America, the theory and practice of urban planning in North America, and to the ethics of civic and business practices linking the public, private, and non-profit sectors. It examines the tensions among market-based development, community action, and public intervention. Topics range in scale from housing style choices to aggregate trends in metropolitan form and cover a wide range of actors including individual households, private builders and developers, reformers, nonprofit organizations, and governments. The course will focus on plans as the outcome of political processes with specific consequences for different constituencies within the city.

USP 613 - Urban Economic and Spatial Structure (3)

Provides an introduction to the economic and spatial aspects relevant to the field of urban studies. Provides an overview of existing theories and empirical evidence relating to urban spatial and economic relationships. Examines the impact of federal, state, and local government policies, and changing economic conditions on these relationships.

USP 614 - History and Theory of Urban Studies (3)

Leading thinkers and milestones in the analysis of urban development and urban life. Complementary theories and models of the social sciences. Postmodern approaches.
USP 615 - Economic Analysis of Public Policy (4)
Introduction to the use of microeconomic analysis in the evaluation of public policy. Intended for entering graduate students with a limited background in economics. Develops basic analytic methods and emphasizes application of the analysis to issues of public policy. Prepares students for advanced classes that use this type of analysis.

USP 616 - Cities in the Global Political Economy (3)
Introduction to political theory and the political economy of globalization. Begins with core political ideas from classical works of political economy (Locke, Rousseau, Smith, Mills, Marx, Marshall, Keynes, Friedman, and Rawls) and proceeds to an analysis of the rise of transnationalism and globalization. Looks at changes in the global economy, revolutionary changes to capitalism, the fall of communism, and impacts of globalization on cities, communities, the state, work, social mobility, welfare, cultural diversity, and the environment.

USP 617 - The Sociology and Politics of Urban Life (3)
A survey of important theories of and empirical research about the social structure and political dynamics of urban areas. The impacts of globalization on urban social and political life, the changing nature of community and social relations within cities and suburbs, and evolving patterns of intergovernmental cooperation and conflict within metropolitan regions will be analyzed.

USP 619 - Development Partnerships (3)
Considers public and private partnerships to develop real estate in terms of the benefits to the wider urban community and policy goals such as affordable housing, community redevelopment to economic development, and sustainability. The course looks at how public and private organizations can meet policy goals, create economic returns, and mitigate risk. Expected preparation: USP 523.

USP 624 - Development Project Design (3)
Provides an understanding of architectural practice, the value added by design, the intersection of design with broader community concerns and developer’s objectives, and the management of the design process, including tools for decision analysis in all phases of the building design process. Case studies of the major building types will be presented. Expected preparation: USP 523.

USP 625 - Green Buildings II (3)
Applies green building concepts to advanced real estate problems, including the rehabilitation and adaptive reuse of existing real estate properties. Properties being covered include retail, office, hotel, industrial, and residential properties. The class will examine techniques for increasing density, recycling materials, improving energy efficiency, and creating healthy work and living environments. The course will look at property management and portfolio management from a green building perspective.

Prerequisite: USP 529.

USP 630 - Research Design (4)
Principles of research design, including philosophical bases of scientific research, approaches to research, problem identification, problem statement, development of research questions, development of research hypotheses, and the relationship of research hypotheses to modes of data gathering and analysis. The laboratory (530L) must be taken concurrently. Recommended prerequisite: USP 430.

Corequisite: USP 630.

USP 630L - Research Design Lab (0)
Research design lab.

Corequisite: USP 630.

USP 634 - Data Analysis I (4)
Application of multivariate statistical analysis in an urban context. Emphasis on applications of various techniques within the general linear model. Recommended prerequisite: USP 532. The laboratory (USP 534L) must be taken concurrently. Recommended prerequisite: USP 430.

Corequisite: USP 634L.

USP 634L - Data Analysis Lab (0)
Data analysis lab.

Corequisite: USP 634.

USP 636 - Political and Economic Decision-making (3)
Examines the philosophical and conceptual assumptions embodied in alternative decision-making theories in the fields of economics and politics. Designed to show students the differences in individual and collective decision-making processes and the technical and social challenges faced in decision-making processes in the market place and the realm of politics. Examples cover local, national, and international policy topics. This is the same course as PS 559 and may be taken for credit only once. Recommended prerequisite: USP 515/615.

Crosslisted as: PS 559.

USP 654 - Data Analysis II (4)
Takes an applied approach to statistical analysis and research methodology and is the second in a two-course sequence. Provides students with statistical background, conceptual understanding, technical writing skills, computer application, and the ability to apply these skills to realistic data analysis problems and research designs. Topics include simple regression and correlation, multiple regression, and logistic regression. The laboratory (USP 654L) must be taken concurrently. Recommended prerequisites: USP 634 or an equivalent course approved the instructor and prior experience with statistical software.

Corequisite: USP 654.

USP 654L - Data Analysis II Lab (0)
Data analysis lab.

Corequisite: USP 654.

USP 655 - Advanced Data Analysis: Structural Equation Modeling (3)
Introduces students to structural equation modeling, a regression-based technique that incorporates elements of path analysis and confirmatory factor analysis. Topics covered include path analysis, confirmatory factor analysis, and structural models with cross-sectional, longitudinal, and multiple groups. The general goal is to provide a thorough background in the conceptual aspects,
statistical underpinnings, and application of this method.

**USP 656 - Advanced Data Analysis: Multilevel Regression (3)**

Intended to introduce students to multilevel regression techniques (also known as Hierarchical Linear Models or HLM), presenting the conceptual underpinnings and application of the techniques for the two most common applications of multilevel models: hierarchical and longitudinal data sets. Multilevel regression is a statistical model that extends multiple regression to data that are hierarchically structured and is used for the estimation of growth curves with longitudinal data. Hierarchical data are common in many kinds of organizational and regional research, because data occurs in natural groupings such as administrative units, geographic regions, or schools.

**USP 660 - Policy Process (3)**

Focuses on the politics of the policy process. It examines the role, influence and interaction of legislatures, executives, bureaucracies, courts, policy communities and citizens. Follows the stages of policy development: problem definition, agenda setting, budgeting, authorization, implementation and oversight. Case material is taken from federal, state, and local governments with special consideration given to the intergovernmental aspects of the policy process.

**USP 663 - Program Evaluation (3)**

This course is designed as a graduate introduction to the field of evaluation research and program evaluation. Topics covered include contemporary and emerging theoretical perspectives on evaluation research, experimental and quasi-experimental design, internal and external validity and reliability, measurement, analysis of change, ethical issues in evaluation, administration of program evaluation.

**USP 674 - Spatial Analysis (3)**

The use of geographically coded data to identify and anticipate future patterns of human activity in metropolitan areas and systems of cities. Emphasizes techniques to establish whether the characteristic landscapes associated with static and dynamic models of behavior are present. Diffusion processes, expanded location theories, and models of decision making from spatially arrayed cues receive particular attention. Recommended prerequisite: USP 532.

**USP 676 - Activity Location (3)**

The location of human activities in urban systems. Location of economic activities where profit maximization is desired, and location decisions with equity maxima.

**USP 679 - Metropolitan Fiscal Structure (3)**

The course will focus on the following topics: the tax burdens, fiscal resources and expenditure patterns of local governments in metropolitan areas. The impact of revenue sharing and categorical grants. The spatial distribution of local government services, transfer payments, and tax burdens. Review of literature on the urban-suburban exploitation thesis, the Tiebout-Oates model, etc.

Prerequisite: USP 515.

**USP 682 - Sustainable Transportation (3)**

Prerequisite: USP 515/615.

**USP 683 - Qualitative Analysis (4)**

Study of a variety of qualitative methods of analyzing social science problems, with an emphasis on applications to urban studies. Students study the philosophy of academic inquiry, understanding and interpretation of social action. Specific techniques include content analysis, participant observation, field observation, ethnography, interviewing, and focus groups, among others. Organization, coding, and analysis of qualitative data. Expected preparation: USP 630.

**USP 689 - Advanced Urban Politics and Sociology (3)**

This is an advanced readings seminar focusing on the literature and emerging theoretical and methodological debates in the fields of urban sociology and political science. This course is intended as an intensive seminar for graduate students seeking both greater familiarity and involvement with the literature and discourse in these fields.

Prerequisite: USP 517/617.

**USP 697 - Urban Studies Seminar (4)**

Research seminar required for second-year students in the urban studies Ph.D. and Master of Urban Studies programs. Students apply their substantive background and methodological training to develop all the components of a social science research paper: statement of focused research question, literature review, development of hypotheses, definition of appropriate methodology, design of data acquisition, and pilot testing of data acquisition strategy. Expected preparation: USP 514/614, USP 513/613, and USP 517/617.
Lit 4 - Inquiry or 12 credits of literature. Conducted in English. Expected preparation: Sophomore Inquiry.

WLL 335U - The Icelandic Sagas (4)
Explores the sagas and the cultural milieu in which they were created. Conducted in English. Expected preparation: Sophomore Inquiry.

WLL 390 - Languages of the World (4)
Overview of the world's languages and language families. Presentation of specific languages, basic phonemic and structural analyses to illustrate linguistic terms and concepts.

WLL 399 - Special Studies (1-12)
(Credit to be arranged.)

WLL 403 - Thesis (1-9)
(Credit to be arranged.)

WLL 404 - Cooperative Education (1-12)
(Credit to be arranged.)

WLL 405 - Reading and Conference (1-12)
(Credit to be arranged.)

WLL 408 - Workshop (1-12)
(Credit to be arranged.)

WLL 409 - Practicum (1-12)
(Credit to be arranged.)

WLL 410 - Selected Studies (1-12)
(Credit to be arranged.)

WLL 448U - Major Figures in World Literature (4)
Concentrated study of the canon of one or more major writers: for example, Dostoevsky, Cervantes, Goethe. Recommended prerequisite: Sophomore Inquiry or 12 credits of literature. Conducted in English.

WLL 449 - Major Topics in World Literature and Culture (4)
Study of the treatment of topics in one or more of the cultures of the world. Such topics as Europe as self and other, Don Juan, exile, the quest, outlaws and bandits, ghosts, fairies and gods. Also offered for graduate-level credit as WLL 547 and may be taken only once for credit. Recommended prerequisite: Sophomore Inquiry or 12 credits of literature. Conducted in English.

WLL 493 - Language Proficiency Testing and Teaching (4)
Application of proficiency standards in testing and teaching at the novice and intermediate levels. Introduction to ILR/ACTFL/ETS/FSI guidelines and compatible testing methods. Discussion of pragmatic issues: testing technique and test validity; use of teaching materials; logistics. Also offered for graduate-level credit as WLL 593 and may be taken only once for credit. Recommended prerequisite: three years of a foreign language. Conducted in English.

WLL 498 - Methods of Teaching Foreign Languages (4)
Study and analysis of various pedagogical theories as applied to the learning and teaching of foreign languages. Special emphasis on discourse and content analysis. Recommended for prospective language teachers. Also offered for graduate-level credit as WLL 598 and may be taken only once for credit. Recommended prerequisite: three years of a foreign language. Conducted in English.

WLL 501 - Research (1-9)
(Credit to be arranged.)

WLL 504 - Cooperative Education (1-12)
(Credit to be arranged.)

WLL 505 - Reading and Conference (1-12)
(Credit to be arranged.)

WLL 508 - Workshop (1-12)
(Credit to be arranged.)

WLL 509 - Practicum (1-12)
(Credit to be arranged.)

WLL 510 - Selected Studies (1-12)
(Credit to be arranged.)

WLL 549 - Major Topics in World Literature and Culture (4)
Study of the treatment of topics in one or more of the cultures of the world. Such topics as Europe as self and other, Don Juan, exile, the quest, outlaws and bandits, ghosts, fairies and gods. Also offered for undergraduate-level credit as WLL 447 and may be taken only once for credit. Recommended prerequisite: Sophomore Inquiry or 12 credits of literature. Conducted in English.

WLL 560 - Principles of Scholarly Research (4)
A theoretical and practical introduction to research methods and literary theory. Investigation of bibliographic materials, primary texts, secondary literature, and major forms of literary criticism. To be taken in first year of graduate study.

WLL 593 - Language Proficiency Testing and Teaching (4)
Application of proficiency standards in testing and teaching at the novice and intermediate levels. Introduction to ILR/ACTFL/ETS/FSI guidelines and compatible testing methods. Discussion of pragmatic issues: testing technique and test validity; use of teaching materials; logistics. Also offered for undergraduate-level credit as WLL 493 and may be taken only once for credit. Recommended prerequisite: three years of a foreign language. Conducted in English.

WLL 598 - Methods of Teaching Foreign Languages (4)
Study and analysis of various pedagogical theories as applied to the learning and teaching of foreign languages. Special emphasis on discourse and content analysis. Recommended for prospective language teachers. Also offered for graduate-level credit as WLL 498 and may be taken only once for credit. Recommended prerequisite: three years of a foreign language. Conducted in English.

Wr - Writing
Wr 115 - Introduction to College Writing (4)
A writing course for first-year students to help prepare them for Freshman Inquiry or Wr 121. Introduces college-level writing and reading, along with general study skills. Provides practice at formal and informal
writing, responding to a variety of readings, learning textual conventions, and building confidence.

**Wr 212 - Introductory Fiction Writing (4)**

A writing course for lower-division students, in which they develop critical thinking abilities by reading and writing, increase their rhetorical strategies, practice writing processes, and learn textual conventions. Includes formal and informal writing, responding to a variety of readings, sharing writing with other students, and revising individual pieces for a final portfolio of work.

**Wr 199 - Special Studies (1-4)**

May be repeated for a maximum of 12 credits. See department for course description. (Credit to be arranged.)

**Wr 200 - Writing About Literature (4)**

Introduction to various approaches for writing about literature. Focuses on ways of responding to literature, ways of explicating literature, ways of analyzing literature through writing, and ways of integrating formal research into a written analysis of literature. Special attention will be paid to the writing process, including multiple drafting and revision.

**Wr 210 - Grammar Refresher (2)**

A writing course for students who wish to refresh their grammar skills. Using informal and formal writing, it focuses on parts of speech, sentence construction, and punctuation; tracking particular grammar problems; and learning to edit.

**Wr 211 - Writing Practice (4)**

Writing Practice is a writing elective. Students proceed at their own pace through an individualized writing program that emphasizes the writing process and revision. Class time is spent writing and in conference. Recommended: Wr 121 or Freshman Inquiry.

**Wr 212 - Introductory Fiction Writing (4)**

Introduces the beginning fiction writer to basic techniques of developing character, point of view, plot, and story idea in fiction. Includes discussion of student work. Recommended: Freshman Inquiry.

**Wr 214 - Introductory Nonfiction Writing (4)**

An introduction to writing with the major forms and techniques of literary nonfiction. Beginning with exercises in foundational skills such as description, reportage and the crafting of personal narrative, students will write and respond to short works of creative nonfiction. May be repeated once for a total of 8 credits. Expected preparation: Freshman Inquiry or equivalent.

**Wr 215 - Writing Research Papers (4)**

An elective course. The techniques for compiling and writing research papers. Attention to available reference materials, use of library, taking notes, critical evaluation of evidence, and conventions for documenting academic papers. Practice in organizing and writing a long expository essay based on use of library resources. Recommended: Wr 121 or Freshman Inquiry. May not be used to fulfill English major requirements.

**Wr 216 - Media Writing (4)**

Practical experience in forms of technical communication, emphasizing basic organization and presentation of technical information. Focuses on strategies for analyzing the audience and its information needs. Recommended: Wr 121 or Freshman Inquiry.

**Wr 217 - Introductory Technical Writing (4)**

A writing course for upper-division students, which offers sophisticated approaches to writing and reading. Students enhance critical thinking abilities by reading and writing challenging material, refine their rhetorical strategies, practice writing processes with special attention to revision and style, and write and read in a variety of genres. Includes formal and informal writing, sharing writing with other students, and preparing a final portfolio of work. Recommended: satisfactory completion of Wr 211 or Freshman Inquiry.

**Wr 218 - Advanced Writing About Literature (4)**

Covers advanced issues in reading and interpreting literary texts, applied critical approaches, and the conventions of writing about literature, including documentation. Emphasizes writing and research processes, includes peer workshops. Prerequisite: upper-division standing.

**Wr 219 - Technical Report Writing (4)**

Strategies for presenting technical information from the technician, management, and lay person’s perspectives; rhetorical theory and techniques for adapting technical prose to nontechnical audiences; and techniques for emphasizing and de-emphasizing information. Recommended: Wr 323.
Wr 328 - Media Editing (4)
Preparation of news and feature stories for publication. Emphasis is on line editing, copy editing, editorial troubleshooting, headline writing, layout, and integration with multimedia.
Prerequisite: Wr 228.

Wr 330 - Desktop Publishing I (4)
Integrates writing, design, and visual communication with computer technology, with emphasis on preparing students to produce a variety of shorter products combining writing and design elements.

Wr 331 - Advanced Composition (4)
Essay writing with particular attention to student’s area of specialization. Advanced practice in essay writing. Recommended: Freshman Inquiry or two writing courses.

Wr 333 - Advanced Composition (4)
Essay writing with particular attention to student’s area of specialization. Advanced practice in essay writing. Recommended: Freshman Inquiry or two writing courses.

Wr 333H -

Wr 394 - Writing Careers for English Majors (4)
A community based learning course for English majors who want to use their English major to shape a viable career. Students hold an internship/ serve the community and practice public relations/other professional writing.
Prerequisite: upper-division standing.

Wr 399 - Special Studies (1-5)
See department for course description. (Credit to be arranged.)

Wr 400 - Advanced Topics in Composition (4)
Examines a variety of advanced issues in composition. Includes such topics as writing and healing and writing with technology. May be repeated for credit with different topics.
Prerequisite: junior standing.

Wr 404 - Cooperative Education/Internship (1-12)
See department for course description. (Credit to be arranged.)

Wr 405 - Writing and Conference (1-6)
Consent of instructor. See department for course description. (Credit to be arranged.)

Wr 407 - Writing Seminar (1-6)
Consent of instructor. See department for course description. (Credit to be arranged.)

Wr 410 - Selected Topics in Writing (0-6)
See department for course description. (Credit to be arranged.)

Wr 410U - Selected Topics (4)
(Credit to be arranged.)

Wr 412 - Advanced Fiction Writing (4)
Further refines technical skills by demanding longer and more ambitious works of fiction by the advanced writer. Students will have an opportunity to do research and can expect to confront a variety of technical problems emerging from class discussion. Also offered for graduate-level credit as Wr 512 and may be taken only once for credit. Recommended: Wr 312. Consent of instructor required.

Wr 413 - Advanced Poetry Writing (4)
Further refines technical skills by demanding more ambitious works of poetry by the advanced writer. Students will have an opportunity to do research and can expect to confront a variety of technical problems emerging from class discussion. The exploration of various techniques, schools, and poetic voices will be encouraged. Recommended: Wr 313. Consent of instructor required.

Wr 416 - Screenwriting (4)
Students will be introduced to the process of conceiving, structuring, writing, rewriting, and marketing a screenplay for the contemporary American marketplace. “Screenplay paradigms” will be discussed, and a variety of movies will be analyzed. May be repeated for credit. Also offered for graduate-level credit as Wr 516.

Wr 420 - Writing: Process and Response (4)
Provides opportunities for students to write in various genres. Includes language attitudes, writing process, and reader response. Also offered for graduate-level credit as Wr 520. Recommended: one upper-division writing course. May be repeated for a maximum of 8 credits.

Wr 425 - Advanced Technical Writing (4)
Emphasis on a problem-solving approach to adapting technical documents to audiences and organizations. The course includes strategies of organization for complex technical documents, such as proposals and professional articles; strategies for discussing tables and figures; and the use of metaphor to communicate technical information to lay audiences. Also offered for graduate-level credit as Wr 525. Recommended: Wr 327. May be repeated for a maximum of 8 credits.

Wr 426 - Document Design (4)
Document planning, creation, and revision, including discussion of the use and abuse of language in business, government, insurance, and law. Students will consider general strategies for document production; analyze different document styles; address questions of target audience; evaluate documents for readability and efficiency; and study the Plain English Movement and its legislative and legal implications. Also offered for graduate-level credit as Wr 526 and may be taken only once for credit.

Wr 427 - Technical Editing (4)
Gives technical writers practice in technical editing by exposing them to samples of a variety of documents from the files of organizations in the surrounding community. As a community based learning course, it requires students to interact with community partners in collaborative student teams. May be repeated for a maximum of 8 credits. Also offered for graduate-level credit as Wr 527.

Wr 428 - Advanced Media Writing (4)
Building on the journalism skills learned in Media Writing and Media Editing, students use Portland to cover and write stories from community sources. Students are also introduced to reporting on a regular basis from news beats of their choosing. Also offered for graduate-level credit as Wr 528 and may be taken only once for credit. Expected preparation: Wr 328.
Prerequisite: Upper-division standing.
Wr 429 - Writing Computer Documentation (4)

Develop skills in writing computer documentation, primarily user manuals and system specifications. Focuses on analyzing informational needs of the audience, and defining and explaining computer terms and concepts for non-technical and semi-technical audiences. Also offered for graduate-level credit as Wr 529 and may be taken only once for credit. Recommended: Wr 327, ISQA 111 or CS 105 or equivalent, word processing skills.

Wr 430 - Desktop Publishing II (4)

Builds from the foundation in Desktop Publishing I to explore further the skills needed to produce publications in the computer age. Topics include typography, page layout, photography, and informational graphics, with a special emphasis on hands-on project production of a 12-page newsletter or magazine. Also offered for graduate-level credit as Wr 530 and may be taken only once for credit.

Wr 435 - Grammar for Writers (4)

Study of grammar that focuses on writing that reads well aloud. Topics include: editing written work for rhythm, meter, emphasis, and balance; translating prose or poetry; and writing speeches, letters, and other forms of communication. Provides background for students in upper-division and graduate programs that require writing and editing skills. Also offered for graduate-level credit as Wr 535 and may be taken only once for credit.

Wr 456 - Forms of Nonfiction (4)

Explores various forms of nonfiction, including essay, personal essay, reviewing, immersion journalism, and memoir, with practice writing in each. Also offered for graduate-level credit as Wr 556 and may be taken only once for credit.

Wr 457 - Personal Essay Writing (4)

The history and contemporary use of personal essay as a mode of creative communication; gives an understanding of and practice in this kind of writing. Also offered for graduate-level credit as Wr 557 and may be taken only once for credit.

Wr 458 - Magazine Writing (4)

Examines the development of both long- and short-form magazine pieces, as well as the business and economics of magazine publishing. Students write and peer-critique articles in the styles and formats of a variety of publications and magazine departments. Also offered for graduate-level credit as Wr 558 and may be taken only once for credit.

Wr 459 - Memoir Writing (4)

Concentrates on elements necessary for writing successful personal narrative, including structure, tone/voice, dialogue, characterization, tense, and point-of-view. Memoirs will be read and discussed, and students will turn in several pieces over the course of the term for workshop discussion. Also offered for graduate-level credit as Wr 559 and may be taken only once for credit.

Wr 460 - Introduction to Book Publishing (4)

Provides a detailed overview of the publishing process, organized around the division of labor, including introductions to contemporary American publishing, issues of intellectual commerce, copyright law, publishing contracts, book editing, book design and production, book marketing and distribution, and bookselling. Based on work in mock publishing companies, students prepare portfolios of written documents, i.e., book proposals, editorial guidelines, design and production standards, and marketing plans. Guest speakers from the publishing industry and field trips provide exposure to the industry. Also offered for graduate-level credit as Wr 560 and may be taken only once for credit.

Wr 461 - Book Editing (4)

Provides a comprehensive course in professional book editing, including editorial management, acquisitions editing, substantive/developmental editing, and copyediting. Issues specific to both fiction and nonfiction books will be covered. Also offered for graduate-level credit as Wr 561 and may be taken only once for credit.

Wr 462 - Book Design Software (4)

Comprehensive course in professional book design and production. Issues specific to the design of fiction and nonfiction books in a variety of genres and markets will be covered, including the applications of both old and new technologies in design and production. Also offered for graduate-level credit as Wr 562 and may be taken only once for credit.

Wr 463 - Book Marketing (4)

Comprehensive course in professional book marketing. Issues specific to the marketing of fiction/ nonfiction books in a variety of genres and markets will be covered. Students will do market research, produce marketing plans, write press releases, write advertising copy, and develop related marketing materials. Also offered for graduate-level credit as Wr 563 and may be taken only once for credit.

Wr 464 - Business of Book Publishing (4)

Comprehensive course in the business of book publishing. Topics covered include publications management, accounting, book production, distribution, and bookselling. Students learn how a variety of agents, including publishers, publishing services companies, distributors, wholesalers, bookstores, etc., are organized. Also offered for graduate-level credit as Wr 564 and may be taken only once for credit.
Prerequisite: Wr 460.

**Wr 465 - Intellectual Property and Copyright (4)**

Outlines opportunities and pitfalls faced by writer (editor, graphic designer, artist) in legal and ethical spheres. Copyright law, U.S. First Amendment law, defamation, right of privacy, trademark, trade secret law. Discusses the importance of the Internet in rethinking copyright and intellectual property rules. Also offered for graduate-level credit as Wr 565 and may be taken only once for credit.

Prerequisite: Wr 300 or Wr 312 or Wr 313 or Wr 323 or Wr 324 or Wr 327 or Wr 328 or Wr 330 or Wr 331 or Wr 333 or Wr 394 or Wr 399.

**Wr 471 - Typography, Layout, and Production (4)**

Comprehensive course in professional book design and production. Issues specific to the design of fiction and nonfiction books in a variety of genres and markets will be covered. Also offered for graduate-level credit as Wr 571 and may be taken only once for credit.

Prerequisite: Wr 462.

**Wr 472 - Copyediting (4)**

Learn how to improve the clarity, coherency, consistency, and correctness of other people’s writing through application of grammatical and stylistic guidelines. Study grammar, usage, punctuation, and style. Narrow focus on editing at the line and substantive level, with little to no attention given to broad development of a manuscript. Also offered for graduate-level credit as Wr 572 and may be taken only once for credit.

Prerequisite: Wr 461.

**Wr 473 - Developmental Editing (4)**

Explores the relationship between an editor, a writer, and the work in the process of developmental editing—also known as global, substantive, or comprehensive editing. Examines historically significant editor/author relations, how the editorial process and relationships have changed over time, and how editorial expectations shift based on the expectations of the publisher, the constantly changing global marketplace, and the introduction of new technologies. Also offered for graduate-level credit as Wr 573 and may be taken only once for credit.

Prerequisite: Wr 461.

**Wr 474 - Publishing Studio (4)**

Perform the work of a real publishing house, from acquiring manuscripts to selling books. Gain publishing experience by participating in the various departments of a student-staffed publishing house, Ooligan Press. Departments include Acquisitions, Editing, Design and Sustainable Production, Marketing, External Promotions, Sales, Digital Content, Social Media, and Project Management and Operations. Also offered for graduate-level credit as Wr 574; may be taken multiple times for credit.

Prerequisite: Wr 475.

**Wr 475 - Publishing Lab (1)**

Perform the work of a real publishing house, from acquiring manuscripts to selling books. Gain publishing experience by participating in the various departments of a student-staffed publishing house, Ooligan Press. Departments include Acquisitions, Editorial, Design, Marketing and Sales, Digital, and Social Media. Also offered for graduate-level credit as Wr 575; may be taken multiple times for credit.

Prerequisite: Wr 300 or Wr 312 or Wr 313 or Wr 323 or Wr 324 or Wr 327 or Wr 328 or Wr 330 or Wr 331 or Wr 333 or Wr 394 or Wr 399.

**Wr 476 - Publishing for Young Adults (4)**

Study the techniques commonly deployed by writers and publishers of young adult and middle grade literature. Also offered for graduate-level credit as Wr 576 and may be taken only once for credit.

Prerequisite: Wr 300 or Wr 312 or Wr 313 or Wr 323 or Wr 324 or Wr 327 or Wr 328 or Wr 330 or Wr 331 or Wr 333 or Wr 394 or Wr 399.

**Wr 477 - Children’s Book Publishing (4)**

Study the techniques commonly used by writers and publishers of children’s literature. Also offered for graduate-level credit as Wr 577 and may be taken only once for credit.

Prerequisite: Wr 300 or Wr 312 or Wr 313 or Wr 323 or Wr 324 or Wr 327 or Wr 328 or Wr 330 or Wr 331 or Wr 333 or Wr 394 or Wr 399.

**Wr 500 - Advanced Topics in Composition (4)**

Examines a variety of advanced issues in composition. Includes such topics as writing and healing and writing with technology. May be repeated for credit with different topics.

Prerequisite: junior standing.

**Wr 501 - Research (1-12)**

(Credit to be arranged.)

**Wr 502 - Independent Study (1-6)**

(Credit to be arranged.)

**Wr 503 - Thesis (1-12)**

(Credit to be arranged.)

**Wr 504 - Cooperative Education/Internship (1-9)**

See department for course description. (Credit to be arranged.)

**Wr 505 - Writing and Conference (1-6)**

Consent of instructor. See department for course description. (Credit to be arranged.)

**Wr 506 - Special Projects (1-8)**

(Credit to be arranged.)

**Wr 507 - Writing Seminar (1-6)**

Consent of instructor. See department for course description. (Credit to be arranged.)

**Wr 510 - Selected Topics in Writing (0-6)**

See department for course description. (Credit to be arranged.)

**Wr 511 - Advanced Fiction Writing (4)**

Further refines technical skills by demanding longer and more ambitious works of fiction by the advanced writer. Students will have an opportunity to do research and can expect to confront a variety of technical problems emerging from class discussion. Also offered for undergraduate-level credit as Wr 412 and may be taken only once for credit. Recommended: Wr 312. Consent of instructor required.

**Wr 512 - Fiction Writing (4)**

An intensive course for writers who are currently embarked on a project involving the writing of fiction, whether short story, novella, or novel. Recommended prerequisites: Wr 212, 312, 412 or their equivalents. Consent of instructor required.
Wr 514 - Poetry Writing (4)
Traditional workshop format in which students write, revise, and respond to the poems of others. May be repeated for credit.

Wr 515 - Poetry Writing II (4)
Advanced poetry writing at the graduate level. Builds on Wr 514, assumes students will submit their work for publication. Traditional workshop format in which students write, revise, and respond to the poems of others. May be repeated for credit. Recommended prerequisite: Wr 514.

Wr 516 - Screenwriting (4)
Students will be introduced to the process of conceiving, structuring, writing, rewriting, and marketing a screenplay for the contemporary American marketplace. “Screenplay paradigms” will be discussed, and a variety of movies will be analyzed. May be repeated for credit. Also offered for undergraduate-level credit as Wr 416.

Wr 520 - Writing: Process and Response (4)
Provides opportunities for students to write in various genres. Includes language attitudes, writing process, and reader response. Also offered for undergraduate-level credit as Wr 420. Recommended: one upper-division writing course. May be repeated for a maximum of 8 credits.

Wr 521 - MFA Core Workshop in Fiction (4)
The MFA Core Workshop in Fiction focuses on the writing, revision, and critical discussion of student short stories and chapters from novels. Students’ critical analyses of their peers’ work are informed by their study of published fiction in the texts, supplemented by lectures clarifying technical strategies in the writing of fiction. May be taken up to three times for credit. This course is restricted to graduate students admitted to the Writing Program (Fiction).

Wr 522 - MFA Core Workshop in Poetry (4)
The MFA Core Workshop in Poetry focuses on the writing, revision, and critical discussion of student poems. Students’ verbal and written critical analyses of their peers’ work are informed by their reading of published poems representing a range of formal strategies and historical and cultural contexts, and by their reading in prosody and poetics. May be taken up to three times for credit. This course is restricted to graduate students admitted to the Writing Program (Poetry).

Wr 523 - MFA Core Workshop in Nonfiction (4)
The MFA Core Workshop in Nonfiction concentrates on elements necessary for writing successful nonfiction prose— including structure, voice, dialog, characterization, and point-of-view— with a primary emphasis on the in-class workshop and peer review of student pieces. Nonfiction models, both short pieces and book-length, will be read and discussed, and students will write critical responses regarding those models. May be taken up to three times for credit. This course is restricted to graduate students admitted to the Writing Program (Nonfiction).

Wr 525 - Advanced Technical Writing (4)
Emphasis on a problem-solving approach to adapting technical documents to audiences and organizations. The course includes strategies of organization for complex technical documents, such as proposals and professional articles; strategies for discussing tables and figures; and the use of metaphor to communicate technical information to lay audiences. Also offered for undergraduate-level credit as Wr 425. Recommended: Wr 327. May be repeated for a maximum of 8 credits.

Wr 526 - Document Design (4)
Document planning, creation, and revision, including discussion of the use and abuse of language in business, government, insurance, and law. Students will consider general strategies for document production; analyze different document styles; address questions of target audience; evaluate documents for readability and efficiency; and study the Plain English Movement and its legislative and legal implications. Also offered for undergraduate-level credit as Wr 426 and may be taken only once for credit.

Wr 527 - Technical Editing (4)
Gives technical writers practice in technical editing by exposing them to samples of a variety of documents from the files of organizations in the surrounding community. As a community based learning course, it requires students to interact with community partners in collaborative student teams. May be repeated for a maximum of 8 credits. Also offered for undergraduate-level credit as Wr 427.

Wr 528 - Advanced News Writing (4)
Building on the journalism skills learned in Media Writing and Media Editing, students use Portland to cover and write stories from community sources. Students are also introduced to reporting on a regular basis from news beats of their choosing. Also offered for undergraduate-level credit as Wr 428 and may be taken only once for credit.

Wr 529 - Writing Computer Documentation (4)
Develop skills in writing computer documentation, primarily user manuals and system specifications. Focuses on analyzing informational needs of the audience, and defining and explaining computer terms and concepts for non-technical and semi-technical audiences. Also offered for undergraduate-level credit as Wr 429 and may be taken only once for credit. Recommended: Wr 327, ISQA 111 or CS 105 or equivalent, word processing skills.

Wr 530 - Desktop Publishing II (4)
Builds from the foundation in Desktop Publishing I to explore further the skills needed to produce publications in the computer age. Topics include typography, page layout, photography, and informational graphics, with a special emphasis on hands-on project production of a 12-page newsletter or magazine. Also offered for undergraduate-level credit as Wr 430 and may be taken only once for credit.

Wr 535 - Grammar for Writers (4)
Study of grammar that focuses on writing that reads well aloud. Topics include: editing written work for rhythm, meter, emphasis, and balance; translating prose or poetry; and writing speeches, letters, and other forms of communication. Provides background for students in upper-division and graduate programs that require writing and editing skills. Also offered for undergraduate-level credit as Wr 435 and may be taken only once for credit.

Wr 556 - Forms of Nonfiction (4)
Explores various forms of nonfiction, including essay, personal essay, reviewing, immersion journalism, and memoir, with
practice writing in each. Also offered for undergraduate-level credit as Wr 456 and may be taken only once for credit.

Prerequisite: Wr 214 or Wr 228. Instructor approval required.

**Wr 557 - Personal Essay Writing (4)**
The history and contemporary use of personal essay as a mode of creative communication; gives an understanding of and practice in this kind of writing. Also offered for undergraduate-level credit as Wr 457 and may be taken only once for credit.

Prerequisite: Wr 214 or Wr 228. Instructor approval required.

**Wr 558 - Magazine Writing (4)**
Examines the development of both long- and short-form magazine pieces, as well as the business and economics of magazine publishing. Students write and peer-critique articles in the styles and formats of a variety of publications and magazine departments. Also offered for undergraduate-level credit as Wr 458 and may be taken only once for credit.

Prerequisite: Wr 214 or Wr 228. Instructor approval required.

**Wr 559 - Memoir Writing (4)**
Concentrates on elements necessary for writing successful personal narrative, including structure, tone/voice, dialogue, characterization, tense, and point-of-view. Memoirs will be read and discussed, and students will turn in several pieces over the course of the term for workshop discussion. Also offered for undergraduate-level credit as Wr 459 and may be taken only once for credit.

Prerequisite: Wr 214 or Wr 228. Instructor approval required.

**Wr 560 - Introduction to Book Publishing (4)**
Provides a detailed overview of the publishing process, organized around the division of labor, including introductions to contemporary American publishing, issues of intellectual commerce, copyright law, publishing contracts, book editing, book design and production, book marketing and distribution, and bookselling. Based on work in mock publishing companies, students prepare portfolios of written documents, i.e., book proposals, editorial guidelines, design and production standards, and marketing plans. Guest speakers from the publishing industry and field trips provide exposure to the industry. Also offered for undergraduate-level credit as Wr 460 and may be taken only once for credit.

**Wr 561 - Book Editing (4)**
Provides a comprehensive course in professional book editing, including editorial management, acquisitions editing, substantive/developmental editing, and copyediting. Issues specific to both fiction and nonfiction books will be covered. Also offered for undergraduate-level credit as Wr 461 and may be taken only once for credit.

**Wr 562 - Book Design Software (4)**
Provides a strong foundation in design software used in the book publishing industry, focusing on Adobe InDesign. Also explores Adobe Photoshop, Illustrator, and Acrobat, as well as XHTML and e-book design. The class considers audience expectations through a range of hands-on design projects. Also offered for undergraduate-level credit as Wr 462 and may be taken only once for credit.

**Wr 563 - Book Marketing (4)**
Comprehensive course in professional book marketing. Issues specific to marketing of fiction and nonfiction books in a variety of genres and markets will be covered. Students will do market research, produce marketing plans, write press releases, write advertising copy, and develop related marketing materials. Also offered for undergraduate-level credit as Wr 463 and may be taken only once for credit.

**Wr 564 - Business of Book Publishing (4)**
Comprehensive course in the business of book publishing. Topics covered include publications management, accounting, book production, distribution, and bookselling. Students learn how a variety of agents, including publishers, publishing services companies, distributors, wholesalers, bookstores, etc., are organized and function in the marketplace. Also offered for undergraduate-level credit as Wr 464 and may be taken only once for credit.

**Wr 565 - Intellectual Property and Copyright (4)**
Outlines opportunities and pitfalls faced by writer (editor, graphic designer, artist) in legal and ethical spheres. Copyright law, U.S. First Amendment law, defamation, right of privacy, trademark, trade secret law. Discusses the importance of the Internet in rethinking copyright and intellectual property rules. Also offered for undergraduate-level credit as Wr 465 and may be taken only once for credit.

**Wr 571 - Typography, Layout, and Production (4)**
Comprehensive course in professional book design and production. Issues specific to the design of fiction and nonfiction books in a variety of genres and markets will be covered. Also offered for undergraduate-level credit as Wr 471 and may be taken only once for credit.

**Wr 572 - Copyediting (4)**
Learn how to improve the clarity, coherency, consistency, and correctness of other people’s writing through application of grammatical and stylistic guidelines. Study grammar, usage, punctuation, and style. Narrow focus on editing at the line and substantive level, with little to no attention given to broad development of a manuscript. Also offered for undergraduate-level credit as Wr 472 and may be taken only once for credit.

**Wr 573 - Developmental Editing (4)**
Explores the relationship between an editor, a writer, and the work in the process of developmental editing—also known as global, substantive, or comprehensive editing. Examines historically significant editor/author relations, how the editorial process and relationships have changed over time, and how editorial expectations shift based on the expectations of the publisher, the constantly changing global marketplace, and the introduction of new technologies. Also offered for undergraduate-level credit as Wr 473 and may be taken only once for credit.

**Wr 574 - Publishing Studio (4)**
Perform the work of a real publishing house, from acquiring manuscripts to selling books. Gain publishing experience by participating in the various departments of a student-
staffed publishing house, Ooligan Press. Departments include Acquisitions, Editing, Design and Sustainable Production, Marketing, External Promotions, Sales, Digital Content, Social Media, and Project Management and Operations. Also offered for undergraduate-level credit as Wr 474; may be taken multiple times for credit.

Prerequisite: Wr 575.

**Wr 575 - Publishing Lab (1)**

Perform the work of a real publishing house, from acquiring manuscripts to selling books. Gain publishing experience by participating in the various departments of a student-staffed publishing house, Ooligan Press. Departments include Acquisitions, Editorial, Design, Marketing and Sales, Digital, and Social Media. Also offered for undergraduate-level credit as Wr 475; may be taken multiple times for credit.

**Wr 576 - Publishing for Young Adults (4)**

Study the techniques commonly deployed by writers and publishers of young adult and middle grade literature. Also offered for undergraduate-level credit as Wr 476 and may be taken only once for credit.

**Wr 577 - Children's Book Publishing (4)**

Study the techniques commonly used by writers and publishers of children's literature. Also offered for undergraduate-level credit as Wr 477 and may be taken only once for credit.

**WS - Women's Studies**

**WS 101 - Introduction to Women's Studies (4)**

A survey and critical analysis of the essential issues of feminism and their effects on women's lives. Topics include: marriage, family, education, justice and reform, health care, sexuality, political and economic status. Focuses on present realities and future possibilities. An introduction to the interdisciplinary field of women's studies.

**WS 120 - Workshop for Returning Women (4)**

Designed for those who have experienced an interruption in their formal education. Examines the educational history of American women. Analyzes the ways in which the roles, status, and experiences of women affect educational decisions and performance. Includes the development of skills and self-confidence in studying, writing, research, examinations, time management, mathematics and science. Credit cannot be used to satisfy certificate requirements.

**WS 199 - Special Studies (0-12)**

A variable topics course dealing with contemporary and historical issues in feminism. Recent offerings have included History of Women Artists and History of Women in Science. WS 199 is also available for students who wish to pursue directed independent study.

**WS 260 - Introduction to Women's Literature (4)**

Introduction to the texts and contexts of women's literature.

**WS 299 - Special Studies (1-4)**

(Credit to be arranged.)

**WS 301 - Gender and Critical Inquiry (4)**

This is a theory course. Cross-discipline introduction to feminist frameworks including theoretical issues and varying approaches to the study of women and gender. Attention to the relationship between gender and other axes of inequality. Emphasis on the development of critical thinking skills.

Prerequisite: WS 101 Introduction to Women's Studies or permission of instructor.

**WS 305 - Women of Color Feminist Theory (4)**

Examines the theoretical contributions of women of color to feminist theory, scholarship, and activism in both national and transnational contexts.

Prerequisite: WS 101.

**WS 306 - Global Gender Issues (4)**

Study of gender issues in a global framework. Course will focus on a theme that can be studied comparatively, such as women and the environment; race, gender and food justice; public policy and gender. Topic may also highlight a particular country or national/ethnic group. This course may be repeated with different topics.

**WS 306U - Global Gender Issues (4)**

Study of gender issues in a global framework. Course will focus on a theme that can be studied comparatively, such as women and the environment; race, gender and food justice; public policy and gender. Topic may also highlight a particular country or national/ethnic group. This course may be repeated with different topics.

**WS 307 - Women, Activism and Social Change (4)**

Women working collectively to create social change; the activism of self-identified feminists as they struggle to resist and transform oppression as well as the activism of women allied with other social movements. Examines activists' strategies, organizations, goals, accomplishments, and unmet challenges. Topics may include reproductive rights, feminist labor organizing, queer political movements, or third world liberation movements.

Prerequisite: WS 101.

**WS 308 - Topics in Gender, Literature, and Popular Culture (4)**

Explores media, popular culture, and/or literature from a feminist perspective which focuses on how gender and other dimensions of power relations are expressed, reproduced, and challenged within cultural expression. Topics may include gender and popular music; girls' studies through media; class and gender in contemporary literature; depictions of masculinities in films/television; gender and the internet/social networking. This course may be repeated with different topics.

**WS 308U - Topics in Gender, Literature, and Popular Culture (4)**

Explores media, popular culture, and/or literature from a feminist perspective which focuses on how gender and other dimensions of power relations are expressed, reproduced, and challenged within cultural expression. Topics may include gender and popular music; girls' studies through media; class and gender in contemporary literature; depictions of masculinities in films/television; gender and the internet/social networking. This course may be repeated with different topics.
WS 309 - Disney: Gender, Race, and Empire (4)
Explores construction of gender, race, and empire in the animated films of Disney. Examines the content of Disney films created within particular historical and cultural contexts in order to understand cultural production in relation to intersections of racism, sexism, colonialism, and imperialism.

WS 310 - Psychology of Women (4)
Review and evaluate assumptions underlying psychological research on women. Survey the research in areas such as the development of sex differences, acquisition of gender roles, and maintenance of gender stereotypes. Explore the pertinence of these findings to topical areas such as women’s work roles, women and mental health, and the women’s movement.

WS 310U - Psychology of Women (4)
Review and evaluate assumptions underlying psychological research on women. Survey the research in areas such as the development of sex differences, acquisition of gender roles, and maintenance of gender stereotypes. Explore the pertinence of these findings to topical areas such as women’s work roles, women and mental health, and the women’s movement. Recommended prerequisite: 3 credits in psychology.

WS 312 - Feminist Philosophy (4)
Critically examines traditional schools of philosophical thinking from a feminist perspective.

WS 312U - Feminist Philosophy (4)
Critically examines traditional schools of philosophical thinking from a feminist perspective. Recommended prerequisite: one philosophy course from other than Phl 103, 104, 206.

WS 315 - Feminist Analysis (4)
This is an advanced theory and methods course. An exploration of the interpretive frameworks and research strategies utilized in contemporary feminist scholarship. Drawing on examples from more than one discipline, students will be introduced to a range of theoretical and methodological approaches, while learning to identify the choices that scholars make in carrying out their work. Issues under debate within feminist scholarship as well as the differences between feminist scholars and those working from other frameworks will be examined.

Prerequisite: WS 301.

WS 317 - Writing as Activism (4)
Students will work intensively to develop activist writing projects individually and in collaboration with others. Investigate a variety of forms and sources of activist writing, generate new writing in weekly writing workshops, serve as writing partners/coaches with each other, and work cooperatively to complete community-based, writing-involved activist projects.

WS 317U - Writing as Activism (4)
Students will work intensively to develop activist writing projects individually and in collaboration with others. Investigate a variety of forms and sources of activist writing, generate new writing in weekly writing workshops, serve as writing partners/coaches with each other, and work cooperatively to complete community-based, writing-involved activist projects.

WS 330 - Women of Color in the United States (4)
A variable topics course focusing on issues which affect women of color in the United States, historically and today.

WS 330U - Women of Color in the United States (4)
A variable topics course focusing on issues which affect women of color in the United States, historically and today.

WS 331 - Women in the Middle East (4)
Aims to explore the role and status of women in the contemporary Middle East with respect to institutions such as the family, law, education, work and politics -- areas which intersect and overlap with broader cultural questions about women and their place in tradition, modernity, nation-building, Islam and the West. This course is the same as Intl 331 and may only be taken once for credit.

Crosslisted as: Intl 331.

WS 331U - Women in the Middle East (4)
Aims to explore the role and status of women in the contemporary Middle East with respect to institutions such as the family, law, education, work and politics -- areas which intersect and overlap with broader cultural questions about women and their place in tradition, modernity, nation-building, Islam and the West. This course is the same as Intl 331 and may only be taken once for credit.

Crosslisted as: Intl 331.

WS 332 - Race, Class, Gender, and Sexuality in the United States (4)
Examines the ways in which race, class, gender, and sexuality are conceptualized and represented in contemporary U.S. culture and society; investigates the institutions, practices, and discourses that comprise notions of race, class, gender, and sexuality in the United States and how these social categories shape and are shaped by one another.

WS 332U - Race, Class, Gender, and Sexuality in the United States (4)
Examines the ways in which race, class, gender, and sexuality are conceptualized and represented in contemporary U.S. culture and society; investigates the institutions, practices, and discourses that comprise notions of race, class, gender, and sexuality in the United States and how these social categories shape and are shaped by one another.

WS 337 - Communication and Gender (4)
An examination of similarities and differences in male and female communication styles and patterns. Particular attention given to the implications of gender as social construct upon perception, values, stereotyping, language use, nonverbal communication, and power and conflict in human relationships. Discussion of influence of mass communication upon shaping and constructing male and female roles.

WS 337U - Communication and Gender (4)
An examination of similarities and differences in male and female communication styles and patterns. Particular attention given to the implications of gender as social construct upon perception, values, stereotyping, language use, nonverbal communication, and power and conflict in human relationships. Discussion of influence of mass communication upon shaping and constructing male and female roles.
WS 340 - Women and Gender in America to 1848 (4)
Surveys the history of women in the middle North American continent to 1848. It highlights the experiences of and relationships among women of diverse origins, especially Native women, African women, and European women. Key themes include family, kinship, and sex-gender systems; colonialism and slavery; religious life; politics and the law; nation-building and the rise of modern citizenship.

WS 340U - Women and Gender in America to 1848 (4)
Surveys the history of women in the middle North American continent to 1848. It highlights the experiences of and relationships among women of diverse origins, especially Native women, African women, and European women. Key themes include family, kinship, and sex-gender systems; colonialism and slavery; religious life; politics and the law; nation-building and the rise of modern citizenship. Recommended prerequisite: upper division standing.

WS 341 - Women and Gender in America 1848-1920 (4)
Explores the diverse experiences of women in the United States between 1848 and 1920. Key themes include slavery, emancipation, and Reconstruction; colonialism and resistance; women’s rights and social reform; education and wage labor; immigration/migration; and Victorianism and sexual modernism.

WS 341U - Women and Gender in America 1848-1920 (4)
Explores the diverse experiences of women in the United States between 1848 and 1920. Key themes include slavery, emancipation, and Reconstruction; colonialism and resistance; women’s rights and social reform; education and wage labor; immigration/migration; and Victorianism and sexual modernism. Recommended prerequisite: upper division standing.

WS 342 - Women and Gender in the U.S. 1920 to the Present (4)
Surveys women’s lives and gender change in recent U.S. history. Among our themes will be women in politics, the work force, and social movements as well as changes in family life, gender identities, and sexuality. Women’s roles in globalization, the media, and popular culture will figure throughout.

WS 342U - Women and Gender in the U.S. 1920 to the Present (4)
Surveys women’s lives and gender change in recent U.S. history. Among our themes will be women in politics, the work force, and social movements as well as changes in family life, gender identities, and sexuality. Women’s roles in globalization, the media, and popular culture will figure throughout. Recommended prerequisite: upper division standing.

WS 343 - American Family History (4)
History of the American family from the colonial period to the present. The course will draw upon textual sources and oral histories in examining changes in families in the colonial period, and the nineteenth and twentieth centuries.

WS 343U - American Family History (4)
History of the American family from the colonial period to the present. The course will draw upon textual sources and oral histories in examining changes in families in the colonial period, and the nineteenth and twentieth centuries. Recommended prerequisite: Hst 201, 202, Sophomore Inquiry (American Studies), or consent of instructor.

WS 344 - Genes & Society (4)
Explores the principles of genetics, molecular biology and biotechnology within social and historical context. Emphasis on the ethical issues arising from the intersection of genetics, technology and society, with attention to the role of gender, race and class in the formation and application of scientific knowledge. This is the same course as Bi 346 and may be taken only once for credit.

WS 344U - Genes & Society (4)
Explores the principles of genetics, molecular biology and biotechnology within social and historical context. Emphasis on the ethical issues arising from the intersection of genetics, technology and society, with attention to the role of gender, race and class in the formation and application of scientific knowledge. This is the same course as Bi 346U.

WS 344U - Genes & Society (4)
Explores the principles of genetics, molecular biology and biotechnology within social and historical context. Emphasis on the ethical issues arising from the intersection of genetics, technology and society, with attention to the role of gender, race and class in the formation and application of scientific knowledge. This is the same course as Bi 346U.

WS 347 - Science, Gender, and Social Context (4)
Two-term course explores the strengths and limitations of science to describe and predict nature through laboratory and field investigations. These activities will illustrate the transition from a reductionist view of our natural environment to a systems-oriented view. It will place this historical shift in understanding and scientific practice in the contexts of gender, race, and class using selected case studies in environmental management. Includes laboratory and/or fieldwork. This is the first course in a sequence of two: WS 347 and WS 348. This course is the same as Sci 347, Sci 348; may only be taken once for credit.

WS 347U - Science, Gender, and Social Context (4)
Two-term course explores the strengths and limitations of science to describe and predict nature through laboratory and field investigations. These activities will illustrate the transition from a reductionist view of our natural environment to a systems-oriented view. It will place this historical shift in understanding and scientific practice in the contexts of gender, race, and class using selected case studies in environmental management. Includes laboratory and/or fieldwork. This is the first course in a sequence of two: WS 347 and WS 348. This course is the same as Sci 347, Sci 348; may only be taken once for credit. Recommended prerequisite: UnSt 299 Intro to Women’s Studies.

WS 348 - Science, Gender, and Social Context (4)
Two-term course explores the strengths and limitations of science to describe and predict nature through laboratory and field investigations. These activities will illustrate the transition from a reductionist view of our natural environment to a systems-oriented view. It will place this historical shift in understanding and scientific practice in the contexts of gender, race, and class using selected case studies in environmental management. Includes laboratory and/or fieldwork. This is the first course in a sequence of two: WS 347 and WS 348. This course is the same as Sci 347, Sci 348; may only be taken once for credit. Recommended prerequisite: UnSt 299 Intro to Women’s Studies.
management. Includes laboratory and/or fieldwork. This is the second course in a sequence of two: WS 347 and WS 348. This course is the same as Sci 347, Sci 348; may only be taken once for credit.

Crosslisted as: Sci 348.

WS 348U - Science, Gender, and Social Context (4)
Two-term course explores the strengths and limitations of science to describe and predict nature through laboratory and field investigations. These activities will illustrate the transition from a reductionist view of our natural environment to a systems-oriented view. It will place this historical shift in understanding and scientific practice in the contexts of gender, race, and class using selected case studies in environmental management. Includes laboratory and/or fieldwork. This is the second course in a sequence of two: WS 347 and WS 348. This course is the same as Sci 347, Sci 348; may only be taken once for credit. Recommended prerequisite: UnSt 299 Intro to Women's Studies.

Crosslisted as: Sci 348U.

WS 350 - Introduction to Interpersonal Violence (1)
Explores the roots of interpersonal violence, the dynamics of domestic violence against women and children and sexual assault, their causes and effects, community resources for intervention and prevention. Discusses the social norms that influence interpersonal violence as well as the psychological results of violence. Examines the big picture of interpersonal violence and how all forms are interrelated.

WS 351U - Gender and Education (4)
Explores the significance of gender in educational work. The focus will be on the history of gender arrangements in educational organizations and the formation of gender roles in contemporary American society, particularly in the family, schools, and the economy. Students will examine differential socialization of males and females, ongoing practices in educational organizations that are gender-related and/or gender biased and the convergence of gender, race, and class in educational organizations. This course is cross-listed as ELP 455; may only be taken once for credit.

WS 354 - Interpersonal Violence and Special Populations (1)
Physical, emotional and sexual abuse crosses all age, cultural, religious, ethnic, economic and social boundaries. However, the impact of abuse and the remedies and services available to victims/survivors varies widely across different social groups. WS 354: Young Adults and Dating Violence; WS 355: Battered Women in Prison; WS 356: Diversity Awareness and Domestic and Sexual Violence. Each class will consider physical, emotional and sexual abuse. This is the first course in a sequence of three: WS 354, WS 355, and WS 356. Recommended prerequisite: WS 350.

WS 355 - Interpersonal Violence and Special Populations (1)
Physical, emotional and sexual abuse crosses all age, cultural, religious, ethnic, economic and social boundaries. However, the impact of abuse and the remedies and services available to victims/survivors varies widely across different social groups. WS 354: Young Adults and Dating Violence; WS 355: Battered Women in Prison; WS 356: Diversity Awareness and Domestic and Sexual Violence. Each class will consider physical, emotional and sexual abuse. This is the second course in a sequence of three: WS 354, WS 355, and WS 356. Recommended prerequisite: WS 350.

WS 356 - Interpersonal Violence and Special Populations (1)
Physical, emotional and sexual abuse crosses all age, cultural, religious, ethnic, economic and social boundaries. However, the impact of abuse and the remedies and services available to victims/survivors varies widely across different social groups. WS 354: Young Adults and Dating Violence; WS 355: Battered Women in Prison; WS 356: Diversity Awareness and Domestic and Sexual Violence. Each class will consider physical, emotional and sexual abuse. This is the third course in a sequence of three: WS 354, WS 355, and WS 356. Recommended prerequisite: WS 350.

WS 357 - Interventions for Interpersonal Violence (1)
This course sequence will consider interpersonal violence and intervention from a variety of perspectives -- as an individual and societal issue. WS 357: Interventions to Help Women Caught in Interpersonal Violence; WS 358: Treatment Philosophies and Interpersonal Violence; WS 359: Holding Perpetrators of Interpersonal Violence Accountable. Each class will address physical, emotional and sexual abuse issues. This is the first course in a sequence of three: WS 357, WS 358, and WS 359. Recommended prerequisite: WS 350.

WS 358 - Interventions for Interpersonal Violence (1)
This course sequence will consider interpersonal violence and intervention from a variety of perspectives -- as an individual and societal issue. WS 357: Interventions to Help Women Caught in Interpersonal Violence; WS 358: Treatment Philosophies and Interpersonal Violence; WS 359: Holding Perpetrators of Interpersonal Violence Accountable. Each class will address physical, emotional and sexual abuse issues. This is the second course in a sequence of three: WS 357, WS 358, and WS 359. Recommended prerequisite: WS 350.

WS 359 - Interventions for Interpersonal Violence (1)
This course sequence will consider interpersonal violence and intervention from a variety of perspectives -- as an individual and societal issue. WS 357: Interventions to Help Women Caught in Interpersonal Violence; WS 358: Treatment Philosophies and Interpersonal Violence; WS 359: Holding Perpetrators of Interpersonal Violence Accountable. Each class will address physical, emotional and sexual abuse issues. This is the third course in a sequence of three: WS 357, WS 358, and WS 359. Recommended prerequisite: WS 350.
WS 360 - Introduction to Queer Studies (4)
An interdisciplinary course that focuses on the lives of lesbian, gay, bisexual, and trans people in historical and social context. Looks at the historical roots and political uses of sexual norms and sexual identities and explores the complex interactions of race, class, gender, and desire. Finally, looks at some of the current political contests around sexuality.

WS 360U - Introduction to Queer Studies (4)
An interdisciplinary course that focuses on the lives of lesbian, gay, bisexual, and trans people in historical and social context. Looks at the historical roots and political uses of sexual norms and sexual identities and explores the complex interactions of race, class, gender, and desire. Finally, looks at some of the current political contests around sexuality.

WS 361 - Sexual Assault (1)
Examines sexual assault from historical, political, and psychological perspectives; the legal and medical systems' responses to sexual assault; and the trauma that results from rape and the options for healing. Recommended prerequisite: WS 350.

WS 362 - Women and Trauma (2)
Examines effects of trauma on the brain and brain functioning, psychological effects of childhood trauma, resilience as a factor in coping with traumatic experiences, and how to foster healing in trauma survivors. Recommended prerequisite: WS 350.

WS 363 - Moving Beyond Trauma (1)
Examines survival from interpersonal violence, draws on resiliency research to understand what fosters healing, explores the role of support systems, altruism, spirituality, and social activism in overcoming trauma.

WS 365 - The Science of Women's Bodies (4)
The female human body is studied from a multidisciplinary perspective including anatomy, physiology, genetics, cell biology, endocrinology and human development, as well as biochemistry. Current social, cultural and political topics related to the science and policy of women's health are also discussed. This course is the same as Sci 365; may only be taken once for credit.

Crosslisted as: Sci 365.

WS 365U - The Science of Women's Bodies (4)
The female human body is studied from a multidisciplinary perspective including anatomy, physiology, genetics, cell biology, endocrinology and human development, as well as biochemistry. Current social, cultural and political topics related to the science and policy of women's health are also discussed. This course is the same as Sci 365; may only be taken once for credit.

Crosslisted as: Sci 365U.

WS 370 - History of Sexualities (4)
Looks at the various meanings given to sexual desires and practices throughout history. Explores sexuality as reproduction, perversion, pleasure, and as a site of both social/political regulation and subversive agency. Focuses on change over time in the North American context emphasizing the contests involving sexuality beginning with the period of European conquest and ending with looking at HIV/AIDS and transgender issues.

WS 370U - History of Sexualities (4)
Looks at the various meanings given to sexual desires and practices throughout history. Explores sexuality as reproduction, perversion, pleasure, and as a site of both social/political regulation and subversive agency. Focuses on change over time in the North American context emphasizing the contests involving sexuality beginning with the period of European conquest and ending with looking at HIV/AIDS and transgender issues.

WS 372 - Topics in Literature, Gender, and Sexuality (4)
Study of representations of gender and sexuality in literature and related cultural forms. May be repeated for credit with different topics. This is the same course as Eng 372 and may be taken only once for credit.

Crosslisted as: Eng 372.

WS 372U - Topics in Literature, Gender, and Sexuality (4)
Study of representations of gender and sexuality in literature and related cultural forms. May be repeated for credit with different topics. This is the same course as Eng 372 and may be taken only once for credit.

Crosslisted as: Eng 372U.

WS 375 - Topics in Sexuality Studies (4)
Study of different topics related to sexuality. Topics will vary from term to term.

WS 375U - Topics in Sexuality Studies (4)
Study of different topics related to sexuality. Topics will vary from term to term.

WS 377 - Topics in Feminist Spirituality (4)
Investigation of different forms of feminist spirituality. Topics may include feminist biblical interpretation, goddesses and spirituality, and eco-feminist spirituality. This course may be repeated with different topics.

WS 377U - Topics in Feminist Spirituality (4)
Investigation of different forms of feminist spirituality. Topics may include feminist biblical interpretation, goddesses and spirituality, and eco-feminist spirituality. This course may be repeated with different topics.

WS 380 - Women and Politics (4)
Analysis of the political role of women in politics. Reviews historical and contemporary analyses of women's participation and status in politics.

WS 380U - Women and Politics (4)
Analysis of the political role of women in politics. Reviews historical and contemporary analyses of women's participation and status in politics. Recommended prerequisites: PS 101, 102 or upper-division standing.

WS 387 - Feminist Organizations: Theory and Practice (4)
An introduction to the theory and practice of feminist non-profit organizations. Attention to the history of feminist non-profit organizations in the U.S., political and social structures that impact such organizations, and decision-making and management issues related to feminist concepts of power. Partnering with a local feminist non-profit, students will gain hands-on knowledge of how feminist organizations strive to put theory into practice.

Prerequisite: WS 307 or junior standing.

WS 399 - Special Studies (1-6)
(Credit to be arranged.)
WS 401 - Research (1-6)  
(Credit to be arranged.)

WS 402 - Independent Study (1-12)  
(Credit to be arranged.)

WS 404 - Cooperative Education/Internship (1-12)  
(Credit to be arranged.)

WS 405 - Reading and Conference (1-6)  
(Credit to be arranged.) Consent of instructor.

WS 407 - Seminar (1-6)  
(Credit to be arranged.)

WS 407U - Seminar (4)  
(Credit to be arranged.)

WS 409 - Practicum (1-12)  
(Credit to be arranged.)

WS 410 - Selected Topics (1-6)  
(Credit to be arranged.)

WS 411 - Experiential Learning Seminar (2)  
To be taken simultaneously with WS 404 or WS 409. Students will present material based upon their experiences in practica and internships. The seminar provides an opportunity for students to reflect on the settings where they are working and analyze issues that emerge in applying feminist theory to practice.

WS 412 - Feminist Methodologies (4)  
Feminist methodology seeks to assess knowledge-generating strategies in terms of their suitability for feminist research. Analysis of methods and how methods impact outcomes. Development of critical awareness in doing self-directed feminist research. Also offered for graduate-level credit as WS 512 and may be taken only once for credit.
Prerequisite: WS 315.

WS 415 - Senior Seminar (4)  
With a focus on analysis, critique, comparison and connection, students will work collaboratively as well as independently in this theoretical, thematically-based course. Students will be responsible for planning and leading discussion during some sessions as well as presenting and responding to work-in-progress.
Prerequisite: WS 412.

WS 417 - Women in the Economy (4)  
Different economic theoretical perspectives are presented to account for women's particular economic roles currently and historically. Emphasis on women's responsibility for child rearing and housework; women's relatively low wages; occupational segregation by gender; economic differences among women due to ethnicity, generation, and class; and policy issues with particular importance for women's economic situation. Expected preparation: Ec 201, Ec 202.

WS 424 - Women and the Law (4)  
Examines the relationship between women and the law. The first half of the course considers several theories of women's equality. During the second half of the course students will apply these theories to a variety of problems in gender justice. Substantive issues covered may include: sexual harassment, abortion, fetal protection policies, and pornography. This course is the same as PS 425; may only be taken once for credit.
Crosslisted as: PS 425.

WS 425 - Sociology of Gender (4)  
Consideration of the theoretical, methodological, and empirical contributions of current sociological scholarship on gender. Emphasis on the intersection of gender, sexuality, race/ethnicity, and class. Analysis of topics such as: masculinity/femininity, parenting, family, education, work, sexualities, reproduction, politics, and social change. This is the same course as Soc 425 and may be taken only once for credit. Also offered for graduate-level credit as WS 525 and may be taken only once for credit.
Prerequisite: junior standing. Crosslisted as: Soc 425.

WS 426 - Gender & Mental Health (4)  
Social and historical explanations of, and research on, mental illness and mental health, with a focus on gender. Contemporary distributions, diagnoses, and treatments of mental illness among men and women are examined. Focus on psychiatric disorder and gender-based discourse. Also offered for graduate-level credit as WS 526; this is the same course as Soc 426 and may be taken only once for credit.
Prerequisite: Upper-division standing.

WS 428 - Lesbian History (4)  
Surveys the history of lesbian existence in the United States. Begins by asking what "lesbian" means, identifying the different historical markers of female same-sex desire. Using a rich variety of primary and secondary sources, we analyze historical attitudes about female same-sex desire, follow the emergence of lesbian subcultures and communities, examine the development of sexual identities during the twentieth century, and end by considering lesbian issues.

WS 431 - Women in the Visual Arts (4)  
This course studies both the representation of women and gender and the art and patronage by women in various media (painting, sculpture, architecture, printmaking, photography, textiles and mixed media). Explores 19th century and 20th century America and Europe. This is the same course as ArH 431 and may be taken only once for credit.
Crosslisted as: ArH 431.

WS 431U - Women in the Visual Arts (4)  
This course studies both the representation of women and gender and the art and patronage by women in various media (painting, sculpture, architecture, printmaking, photography, textiles and mixed media). Explores 19th century and 20th century America and Europe. This is the same course as ArH 431 and may be taken only once for credit.

WS 443 - British Women Writers (4)  
Study of the works of British women writers with attention to themes, styles, and characteristic concerns in the light of feminist criticism and scholarship. This is the first course in a sequence of two: WS 443 and WS 444. Expected preparation: 15 credits in literature. WS 260 recommended.

WS 444 - British Women Writers (4)  
Study of the works of British women writers with attention to themes, styles, and
characteristic concerns in the light of feminist criticism and scholarship. This is the second course in a sequence of two: WS 443 and WS 444. Expected preparation: 15 credits in literature. WS 260 recommended.

WS 445 - American Women Writers (4)
Study of American women writers, with attention to themes, styles and characteristic concerns, in the light of feminist criticism and scholarship. This is the first course in a sequence of two: WS 445 and WS 446. Recommended prerequisite: 15 credits in literature. WS 260 recommended.

WS 446 - American Women Writers (4)
Study of American women writers, with attention to themes, styles and characteristic concerns, in the light of feminist criticism and scholarship. This is the second course in a sequence of two: WS 445 and WS 446. Recommended prerequisite: 15 credits in literature. WS 260 recommended.

WS 452 - Gender and Race in the Media (4)
Primarily examines the representations of gender and race, including age, class and sexual orientation in various media (mainstream and alternative), and will examine theoretical and methodological approaches which may be used to interpret these representations. In addition, considers the potential impact that media institutions have on people's lives, political decisions and social relations. The overall aim is for students to understand how their own cultural identities affect their media consumption and social positioning. This course is the same as Comm 452/552; course may only be taken once for credit. Crosslisted as: Comm 452.

WS 467 - Work and Family (4)
An examination of the effects of work on family, and family on work, in contemporary society. Includes study of dual-career and dual-work families, effects of maternal employment on children, impact of child care and elder care on the workplace, and parental leave and other workplace supports for families. Implications of research for social policy. Recommended prerequisites: Psy 311 and 3 credits in courses numbered Psy 321 or higher.

WS 470 - Asian American Women's Studies (4)
Interdisciplinary course focusing on the contemporary experiences of Asian American women, examining ways in which race, gender, class, sexuality, and national identity shape the experiences of Asian American women. Topics: histories of immigration and western colonization; family and community structures; representations and stereotypes in media and popular culture; sexuality and sexual identities; mixed-heritage and bicultural experiences; the politics of language; violence against Asian American women; labor force participation; relationship to feminism; and activism and resistance.

WS 470U - Asian American Women's Studies (4)
Interdisciplinary course focusing on the contemporary experiences of Asian American women, examining ways in which race, gender, class, sexuality, and national identity shape the experiences of Asian American women. Topics: histories of immigration and western colonization; family and community structures; representations and stereotypes in media and popular culture; sexuality and sexual identities; mixed-heritage and bicultural experiences; the politics of language; violence against Asian American women; labor force participation; relationship to feminism; and activism and resistance.

WS 471 - Global Feminisms (4)
Themes and theoretical principles of global feminisms, with special emphasis placed on Third World feminist movements. Themes explored include colonialism, globalization, nationalism and nation-building, representation, global economies, and the politics of race, gender, class, sexuality, and nation. Also offered for graduate-level credit as WS 571 and may be taken only once for credit.

WS 479 - Women and Organizational Psychology (4)
Examines the relationship between gender and the social organization of the workplace. Focus is on gender development as socialization (e.g. hierarchy and leadership, discrimination and harassment, deskilling) from a social psychological perspective. Strategies for change are considered. Recommended prerequisites: Psy 310 and 3 additional credits in courses numbered Psy 330 or higher.

WS 480 - Introduction to Critical Disability Studies (4)
Introduction to critical disability studies, what it is, and what it is not. Through lectures, readings, guest speakers, assignments and small group discussion, students will engage with each other to encourage application of new concepts in their current and future academic and personal lives.

Prerequisite: Senior standing or instructor approval. Also offered for graduate-level credit as WS 580 and may be taken only once for credit. Prerequisite: Senior standing or consent of instructor.

WS 481 - Disability and Intersectionality (4)
Focuses on intersectionality in the context of disability. Explores the historical and current contexts of disability in combination with race, ethnicity, gender, sexuality, and social class. Students engage with the application of these new concepts in their current and future studies and personal lives. Also offered for graduate-level credit as WS 581 and may be taken only once for credit.

Prerequisite: WS 480 or consent of instructor.

WS 501 - Research (1-12)
(Credit to be arranged.)

WS 502 - Independent Study (1-9)
(Credit to be arranged.)

WS 505 - Reading and Conference (1-8)
(Credit to be arranged.)

WS 507 - Seminar (1-8)
(Credit to be arranged.)

WS 509 - Practicum (1-8)
(Credit to be arranged.)

WS 510 - Selected Topics (3-4)
(Credit to be arranged.)

WS 512 - Feminist Methodologies (4)
Feminist methodology seeks to assess knowledge-generating strategies in terms of their suitability for feminist research.
Analysis of methods and how methods impact outcomes. Development of critical awareness in doing self-directed feminist research. Also offered for undergraduate-level credit as WS 412 and may be taken only once for credit.

Prerequisite: WS 315.

**WS 517 - Women in the Economy (4)**

Different economic theoretical perspectives are presented to account for women’s particular economic roles currently and historically. Emphasis on women’s responsibility for child rearing and housework; women’s relatively low wages; occupational segregation by gender; economic differences among women due to ethnicity, generation, and class; and policy issues with particular importance for women’s economic situation. Recommended prerequisites: Ec 201, 202.

**WS 525 - Sociology of Gender (4)**

Consideration of the theoretical, methodological, and empirical contributions of current sociological scholarship on gender. Emphasis on the intersection of gender, sexuality, race/ethnicity, and class. Analysis of topics such as: masculinity/femininity, parenting, family, education, work, sexualities, reproduction, politics, and social change. This is the same course as Soc 525 and may be taken only once for credit. Also offered for undergraduate-level credit as WS 425 and may be taken only once for credit.

Prerequisite: junior standing. Crosslisted as: Soc 525.

**WS 526 - Gender & Mental Health (4)**

Social and historical explanations of, and research on, mental illness and mental health, with a focus on gender. Contemporary distributions, diagnoses, and treatments of mental illness among men and women are examined. Focus on psychiatric disorder and gender-based discourse. Also offered for undergraduate-level credit as WS 426; this is the same course as Soc 526 and may be taken only once for credit.

**WS 530 - Women in the Visual Arts II (4)**

This course studies both the representation of women and gender and the art and patronage by women in various media (painting, sculpture, architecture, printmaking, photography, textiles and mixed media). Explores 19th century and 20th century America and Europe.

**WS 545 - American Women Writers (4)**

Study of American women writers, with attention to themes, styles and characteristic concerns, in the light of feminist criticism and scholarship. Recommended prerequisite: 15 credits in literature. WS 260 recommended.

**WS 546 - American Women Writers (4)**

Study of American women writers, with attention to themes, styles and characteristic concerns, in the light of feminist criticism and scholarship. Recommended prerequisite: 15 credits in literature. WS 260 recommended.

**WS 552 - Gender and Race in the Media (4)**

Primarily examines the representations of gender and race, including age, class and sexual orientation in various media (mainstream and alternative), and will examine theoretical and methodological approaches which may be used to interpret these representations. In addition, considers the potential impact that media institutions have on people’s lives, political decisions and social relations. The overall aim is for students to understand how their own cultural identities affect their media consumption and social positioning. This course is the same as Sp 452/552; course may only be taken once for credit.

Crosslisted as: Comm 552.

**WS 555 - Gender and Education (4)**

Explores the significance of gender in educational work. The focus will be on the history of gender arrangements in educational organizations and the formation of gender roles in contemporary American society, particularly in the family, schools, and the economy. Students will examine differential socialization of males and females, ongoing practices in educational organizations that are gender-related and/or gender biased and the convergence of gender, race, and class in educational organizations. This course is cross-listed as ELP 455; may only be taken once for credit.

**WS 570 - Asian American Women’s Studies (4)**

Interdisciplinary course focusing on the contemporary experiences of Asian American women, examining ways in which race, gender, class, sexuality, and national identity shape the experiences of Asian American women. Topics: histories of immigration and western colonization; family and community structures; representations and stereotypes in media and popular culture; sexuality and sexual identities; mixed-heritage and bicultural experiences; the politics of language; violence against Asian American women; labor force participation; relationship to feminism; and activism and resistance.

**WS 571 - Global Feminisms (4)**

Themes and theoretical principles of global feminisms, with special emphasis placed on Third World feminist movements. Themes explored include colonialism, globalization, nationalism and nation-building, representation, global economies, and the politics of race, gender, class, sexuality, and nation. Also offered for undergraduate-level credit as WS 471 and may be taken only once for credit.

Prerequisite: WS 301 or WS 315 or consent of instructor.

**WS 580 - Introduction to Critical Disability Studies (4)**

Introduction to critical disability studies, what it is, and what it is not. Through lectures, readings, guest speakers, assignments and small group discussion, students will engage with each other to encourage application of new concepts in their current and future academic and personal lives.

Prerequisite: Senior standing or instructor approval. Also offered for undergraduate-level credit as WS 480 and may be taken only once for credit.

**WS 581 - Disability and Intersectionality (4)**

Focuses on intersectionality in the context of disability. Explores the historical and current contexts of disability in combination with race, ethnicity, gender, sexuality, and social class. Students engage with the application of these new concepts in their current and future studies and personal lives. Also offered for undergraduate-level credit as WS 481 and may be taken only once for credit.
WS 583 - Critical Disability Studies Service Learning I (2)

The foci of the 3 quarter sequence are to: prepare students to be culturally responsive change agents working equitably with people with disabilities, provide an opportunity for students to work cooperatively with disability communities, and result in an in-depth study of a policy impacting people with disabilities. This is the first course in a sequence of three: WS 583, WS 584, WS 585 and must be taken in sequence.

Prerequisite: WS 580, WS 581.

WS 584 - Critical Disability Studies Service Learning II (2)

The foci of the 3 quarter sequence are to: prepare students to be culturally responsive change agents working equitably with people with disabilities, provide an opportunity for students to work cooperatively with disability communities, and result in an in-depth study of a policy impacting people with disabilities. This is the second course in a sequence of three: WS 583, WS 584, WS 585 and must be taken in sequence.

Prerequisite: WS 580, WS 581, WS 583.

WS 585 - Critical Disability Studies Service Learning III (2)

The foci of the 3 quarter sequence are to: prepare students to be culturally responsive change agents working equitably with people with disabilities, provide an opportunity for students to work cooperatively with disability communities, and result in an in-depth study of a policy impacting people with disabilities. This is the third course in a sequence of three: WS 583, WS 584, WS 585 and must be taken in sequence.

Prerequisite: WS 584.
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