EC 380: Introduction to Mathematical Economics Syllabus as of 9/24/2023 Fall 2023

(This syllabus can be updated at the instructor's discretion.)

Lecture: Tuesdays and Thursdays 10:00 am - 11:50 am, Room: Urban Center Building, Room 412

Instructor: Arnab Mitra

Email: amitra@pdx.edu

Note that you are always welcome to contact me at the above email. Please do not try to email me using the Canvas Learning Management System. I do not check my messages in Canvas.

Office Hours: Tuesdays and Thursdays 12:15 – 1:15 pm, Urban Center Building, Room 450-C

Teaching Assistant: Rachel Pearlman Email: rapearl@pdx.edu

Required Text:

- 1. *Fundamental Methods of Mathematical Economics* 4th Edition, Kevin Wainwright and Alpha C. Chiang, McGraw-Hill, 2004.
- 2. Schaum's Outline of Introduction to Mathematical Economics, 3rd Ed, Edward T. Dowling. Cheap and a really good source for sample problems.

Supplementary Text:

Mathematics for Economists, Carl P. Simon and Lawrence Blume, W.W. Norton and Co., 1994. ISBN-10: 0393957330. ISBN-13: 978-0393957334

Prerequisites:

Math 251, EC201, EC202

Course Content

This course presents some of the fundamental mathematical techniques required for studying economics at the undergraduate level. Mathematical concepts are developed in the context of economics and applications are drawn from a wide range of fields including microeconomics, macroeconomics, economic growth, international trade, and environmental economics, among others.

The course is divided into five sections. The course starts with an intensive overview of functions, sets, equations, and then proceed to study linear algebra followed by univariate calculus and multivariate calculus. The course ends with a brief introduction to optimization and integral calculus. Detailed chapter assignments for each section are on the last page.

Course Outline

- Part-I. Introduction and overview of sets, functions equations (1 week)
- Part II. Linear algebra (3 weeks)
- Part-III. Univariate calculus (3 weeks)
- Part-IV. Multivariate calculus (1 week)
- Part-V. Optimization and integral calculus (1 week)

Course Objectives

- 1. Thoroughly understand mathematical methods and concepts employed in economic models and equilibrium analysis.
- 2. Competently apply mathematical methods in problems and applications that aim to analyze economic problems.

Time Commitments and Preparation:

Every week you should allocate a few hours in addition to class time for going back over notes, solving practice problems, and working on homework problems.

The homework assignments will be made available at least 4-5 days before the due date. Please start working on them early; solving problems sometimes requires thinking slowly through different possibilities and it is important that you have time to start, stop, and come back and engage more with the questions.

Course Requirements: *Exams:*

We will have one mid-term exam and one final exam. The final exam will be cumulative. The format of the exams will be a combination of multiple-choice questions and short answer questions and problems similar in structure to the homework assignments and practice exercises. The midterm is tentatively scheduled during the 5th week of the term. The final is scheduled from 10:15 am to 12:05 pm on Tuesday, December 5th. Please note that the university has scheduled the final exam date and time. Please refer to this website for details.

Homework:

Learning the material covered in this course requires practice. You will have four homework assignments for the course. I encourage you to discuss the homework questions with each other, but everyone must submit their own assignment. The homework assignments will be handed out in class 4-5 days before the due date. They need to be turned in at the **beginning** of lecture on the due date (unless otherwise noted).

Practice Exercises:

Learning economics requires solving lots of problems. We will solve a number of practice exercises; some in class and some others you can work on at home.

Attendance:

For this upper-level course with complex material students should strive to attend every class and arrive on time. I expect you to pay attention, engage with the class and respect your peers. Please **DO NOT** use cell phones or laptops during class. In my experience, students who come to class prepared typically learn the material better and do better on the exams. Remember that I am here to help you learn the materials.

Grade Distribution:

Please consult the distribution below.

Homework (7% each for 4 Assignments); 28% Mid-term Exam; 30% Final Exam; 34% Class Participation; 8% **Total; 100%**

Administrative Course Policies:

Affirmative Action:

Portland State University supports equal opportunity for all, regardless of 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.

Academic Integrity:

Academic honesty is expected and required of students enrolled in this course. Suspected academic dishonesty in this course will be handled according to the procedures set out in the Student Code of Conduct.

Academic Accommodations:

Students with accommodations approved through the Disability Resource Center are responsible for contacting the faculty member prior to, or during, the first week of term to discuss accommodations. Students who believe they are eligible for accommodations but who have not yet obtained approval should contact the DRC immediately.

Questions during lectures or review sessions:

I believe that asking questions is a very important part of the learning process. The material we learn can be complex and the more questions you ask the easier it becomes to understand the material. Please ask questions.

Tentative Course Schedule and Reading Assignments Week Date

Week	Date	Class	Lectures	Readings	Homework (HW)*
1	Tuesday, September 26	1 st Lecture	Intro, Syllabus, Econ Model	Chapter 1	n/a
1	Thursday, September 28	2 nd Lecture	Economic Models and Functions	Chapter 2	n/a
2	Tuesday, October 3	3 rd Lecture	Functions, Sets, & Linear Models	Chapters 2 and 3	See below
2	Thursday, October 5	4 th Lecture	Linear Models & Matrix Algebra	Chapters 3 and 4	HW 1
3	Tuesday, October 10	5 th Lecture	Linear Models & Matrix Algebra	Chapters 4 and 5	HW 2
3	Thursday, October 12	6 th Lecture	Linear Models & Matrix Algebra	Chapters 4 and 5	HW 2
4	Tuesday, October 17	7 th Lecture	Comp Statistics, Problem Session	Chapter 6	n/a
4	Thursday, October 19	8 th Lecture	Comp Statistics, Exam Q and A	Chapter 6	n/a
5	Tuesday, October 24	9 th lecture	Exam Q and A	Chapter 6	n/a
5	Thursday, October 26	n/a	Midterm	n/a	n/a
6	Tuesday, October 31	10 th Lecture	Univariate Calculus	Chapter 7	n/a
6	Thursday, November 2	11 th Lecture	Univariate Calculus	Chapter 7	n/a
7	Tuesday, November 7	12 th Lecture	Univariate/Multivariate Calculus	Chapters 7 and 8	n/a
7	Thursday, November 9	13 th Lecture	Multivariate Calculus	Chapter 8	n/a
8	Tuesday, November 14	14 th Lecture	Multivariate Calculus	Chapter 8	HW 3
8	Thursday, November 16	15 th Lecture	Multivariate Calculus/Optimization	Chapter 8	n/a
9	Tuesday, November 21	16 th Lecture	Multivariate Calculus/Optimization	Chapters 8 and 9	HW 4

Week	Date	Class	Lectures	Readings	Homework
0	Thursday	Thonko	2/2	n/o	
9	mursuay,	Thanks-	n/a	11/a	n/a
	November 23	giving			
10	Tuesday,	17 th	Optimization	Chapters 9	n/a
	November 28	Lecture		and 11	
10	Thursday,	18 th	Optimization, Exam Q	Chapters 9	n/a
	November 30	Lecture	and A	and 11	

Final Exam - 10:15 am to 12:05 pm on Tuesday, December 5th

* = The homework assignments are due at the beginning of class on the due date.