

GUIDELINES FOR Ph.D. DEGREE CHEMISTRY

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I. Overview

The Ph.D. degree in Chemistry involves the successful completion of the following requirements: 1. entrance exams, 2. course program, 3. seminar program, 4. comprehensive exam, 5. research prospectus exam, 6. independent research proposal, 7. dissertation research and preparation, and 8. final dissertation defense. It is the function of this document to delineate these requirements and to define the Chemistry Department's supervisory role. The information given here supplements statements of degree requirements published in the University Bulletin. Additional information may be obtained from the Office of Graduate Studies and Research and the Chemistry Departmental office.

II. Student Advising

A. Entrance Exams

Prior to beginning the proposed program, each student will be required to demonstrate basic proficiency in at least three of the five recognized subspecialties in chemistry (Analytical, Biochemistry, Inorganic, Organic, and Physical Chemistry). The primary mechanism will be through acceptable performance on entrance examinations administered prior to beginning the Ph.D. program. These are standardized exams constructed by the American Chemical Society to assess the backgrounds of beginning graduate students. Following the examinations, a meeting will be scheduled with the Graduate Admissions and Advising Committee (GAAC). Initial advising of the course of study will also be completed during this meeting, including a plan to address any deficiencies revealed in the entrance exams. All students will be required to pass at least three of the entrance exams by the end of their first academic year; failure to do so will result in their removal from the program.

B. Graduate Admissions and Advising Committee

Entering students are initially advised by the Graduate Admissions and Advising Committee (GAAC). In order to facilitate the advising process, all new graduate students are required to take Graduate Entrance Exams (mentioned above) prior to enrollment in a course program. Once the examination results are known, each new student will meet with the GAAC to discuss a course program for the coming academic year. The GAAC will continue to oversee the student's progress and be available for informal advising until such time as a Research Advisor and Dissertation Advisory Committee are selected.

C. Research Advisor

Each regular degree student must begin discussing potential research projects with faculty members during the **FIRST TERM** and must have selected a Research Advisor before the end of the second term. The student is urged to make this decision as soon as possible in order to choose course work that complements the research program. The required procedure for this selection is as follows:

1. If admitted in the Fall, the student will register for CH 510 *Survey of Faculty Research*, where Faculty members present their research. The student will discuss fields of interest/research topics with Faculty and if necessary, the Department Chair using the Selection of Research Adviser form provided in Appendix B or available from the Chemistry Office. The student must have visited at least three faculty members on the list as well as obtain Faculty member initials/date on the form, which is submitted to the Chemistry Office.
2. After completing this process, the student will request a conference with the Department Chair to discuss preferences for a Research Advisor.
3. The Department Chair in consultation with the GAAC will determine whether the faculty member preferred by the student is willing to accept the student; if not, the Department Chair will assist the student in making another suitable selection.

D. Dissertation Advisory Committee

4. Once the selection is final, the Dissertation Advisory Committee will be appointed by the Department Chair upon consultation with the Research Advisor. The committee shall consist of the Research Adviser, who serves as chair, and three other faculty members with expertise in the thesis area. Two of the three committee members (aside from the Research Advisor) must be tenured or tenure-track faculty of the Chemistry Department. The third must be from another department. An additional member of the committee may be appointed at the recommendation of the Research Advisor and need not be from the Chemistry Department, and under certain conditions (see the Bulletin for details) may be from outside Portland State University. All members of the Dissertation Advisory Committee must hold doctoral degrees. University approval of the Dissertation Advisory Committee is required prior to the oral prospectus exam (Appendix B, form GO-16D) which must be completed by the end of the student's third full year in residence.

At the time of the selection of the Research Advisor and formation of the Dissertation Advisory Committee, responsibility for the student's program will pass from the GAAC to these entities. The Research Advisor has the major responsibility for monitoring the progress of the student, even in cases where the research is performed in collaboration with another laboratory. The Research Advisor will provide advice on and preliminary approval of the program of study. In addition, it is the Research Advisor's responsibility to schedule meetings with the Dissertation Advisory Committee, including the Prospectus and Final Oral Examinations and to submit the Annual Summary Report to the Department Chair. These reports become part of the student's permanent file.

The functions of the Dissertation Advisory Committee include annual review of the student's course program and research progress. This review will be based on a yearly meeting with the student, which may also be scheduled at the discretion of the Research Advisor, Department Chair, or any member of the Dissertation Advisory Committee. The Dissertation Advisory Committee is also responsible for final approval of the program of study, the research prospectus/recommendation for Advancement to Candidacy, the Independent Research Proposal, and the Dissertation. In addition, the Dissertation Advisory Committee

administers the candidate's oral prospectus exam, presentation of Independent Research Proposal, and final oral exam. Note: the Dissertation Advisory Committee fulfills the roles of both the Advisory Committee and the Dissertation Committee (specified in the University Bulletin) for Ph.D. students in Chemistry.

III. General Requirements

A. Departmental Seminar

Students must regularly attend the chemistry departmental seminar (1 credit per term pass/no pass for every term the student is enrolled, except the term in which they present the literature seminar, where they will register for 1 credit, letter grade option.)

All students in the Chemistry Ph.D. program will be required to present a literature seminar during their second year in residence. This presentation will be evaluated by the entire chemistry faculty.

B. Comprehensive Examination

Before beginning the third full year in residence, all doctoral students will be required to sit for a written comprehensive examination in one of the sub-specialty areas of chemistry. The comprehensive exam is a two-day written exam composed by the faculty members in the relevant area. The first day is designed to assess a student's knowledge of and understanding of fundamental and advanced content in the sub-discipline, while the second day assesses the student's ability to read and understand the contemporary chemical literature. In the event of a no-pass, an opportunity to retake the examination will be given at the end of the first quarter of the third year in residence. In the event that the student again receives a no-pass they will be removed from the program.

C. Oral Prospectus Examination

During the third year in residence, after passing the comprehensive exam, the student will be required to submit and orally defend a prospectus of the proposed dissertation research, including work completed to date. This presentation will be evaluated by the members of the DAC, who will also have the opportunity to ask questions of a more general nature. Successful completion of this examination will constitute advancement to candidacy for the degree of Ph.D. in chemistry. If the student fails this exam the DAC will submit to the GAAC a recommendation that the student either resubmit and defend their prospectus or be removed from the program.

D. Independent Research Proposal

To demonstrate the ability to think creatively and logically, which are the hallmarks of the Ph.D. degree, students will be required to prepare an independent research proposal unrelated to the subject of their graduate research. This will be of the format required for the National Institutes of Health Postdoctoral Research Fellow Program or a comparable national program approved by the DAC. The proposal and an oral presentation of its contents will be evaluated by the DAC.

E. Dissertation

Upon completion of the approved research plan (see prospectus requirement above) the

candidate will prepare a dissertation describing the results of the course of study. The dissertation will be prepared according to the General Thesis Instructions, GO-14 form, obtainable from the Office of Graduate Studies and Research (OGSR). Copies of the dissertation will be presented to members of the DAC at least 2 weeks before the oral exam. Following acceptance of the dissertation by the DAC, the dissertation will be orally presented and defended by the candidate. The examination committee will consist of the student's DAC and a representative of the Office of Graduate Studies and Research. In the first part of the defense the student will present a public seminar on the dissertation research. This will be followed by a private oral examination attended by members of the examination committee covering the subject area of the thesis. Successful completion of the oral examination and the suggested revisions to the dissertation imposed by the examination committee will be required for completion of the degree.

F. Coursework

In addition to the above-described program elements, a minimum of 18-24 credit hours of approved coursework at the 500/600 level is required. The student will be required to take at 6 courses in discrete courses (other than Seminar, Research, etc.) with the majority of the coursework in a major sub-specialty area and the balance in a minor area or areas. Courses with a lab, such as CH 536/37 are considered as one course. In general the majority of coursework will be completed in the first two years of residence. Due to the interdisciplinary nature of the departmental research programs, courses from outside chemistry will routinely be part of a student's curriculum. All coursework must be approved by the graduate advisor and the GAAC/DAC.

G. Coursework by Research Emphasis

Given the research emphasis in Materials, Biological, and Environmental Chemistry in the department, relevant coursework for each area is outlined below. A comprehensive list of graduate course offerings in the Department of Chemistry follows.

IV. Required Coursework

A. Emphasis in Materials Chemistry

Basic courses

Expected of students in their undergraduate background or to be taken in the first year of graduate school

Inorganic Chemistry with lab (e.g., CH 511, 512, 518)

Core courses

The following courses will be required for all students in the Materials Chemistry emphasis:

Introduction to Materials and Solid-State Chemistry (CH 615M)

Polymer Chemistry (CH 634P)

Supramolecular Chemistry (CH 634S)

Specialized Electives

Students will choose a *minimum* of three additional courses from the lists of courses below:

Advanced Polymer Chemistry (CH 610)
Fabrication and Characterization of Nanomaterials (CH 510)
Electrochemistry (CH 620E)
Electronic Materials (CH 610E)
Surface Chemistry (CH 660E)
Liquid Crystals / Display Technology (CH 610L)
Sensors (CH 610S)
Molecular Modeling (CH 510M)
Electronics and Instrumentation (CH 525, 526)
Physical Organic Chemistry (CH 530, CH 635)
Organic Synthesis (CH 531, CH 633)
Photochemistry (CH 661)
Lasers (CH 610L)

Appropriate courses from outside of the Department of Chemistry include:

Solid-State Physics (PH 513)
Solid-State Devices (PH 540, 541)
Nanotechnology (PH 510N)
Electron Microscopy (PH 551, 552)
Physical Metallurgy (PH 581)
Engineering Material Science (ME 513)
BioMEMs and Nanobiotechnology (ECE 510)

Students may also elect to do relevant coursework at local institutions such as OHSU/OGI. Potential courses include:

ECE 512, 513 Operation of Semiconductor Devices I
ECE 515 Introduction to Device Physics
ECE 516, 517 Semiconductor Device Design and Processing
ECE 535 Thin Film Deposition and Applications in Semiconductor Fabrication
ECE 536 Surface Science for Semiconductor Technology
ECE 537 Characterization of Thin Films for Semiconductor Technology
ECE 560, 561, 562 Microelectronic Device Fabrication
ECE 563, 564 Plasma Processing of Semiconductors
ECE 565 Analytical Scanning Electron Microscopy
ECE 569 Electronic Materials and Device Characterization
ECE 584 Modern Photolithographic Engineering

B. Emphasis in Biological Chemistry

Basic courses

Expected of students in their undergraduate background or to be taken in the first year of graduate school

General Biochemistry with lab (e.g., CH 590, 591, 592, 593)

Core courses

The following courses will be required for all students in the Biological Science emphasis:

Enzyme Structure and Function (CH 693)
Nucleic Acid Structure and Function (CH 694; new)

Specialized Electives

Students will choose a *minimum* of four additional courses from the lists of courses below:

Chemistry and Biosynthesis of Natural Products (CH 610C)
Biochemical Catalysis (CH 610)
NMR Spectroscopy (CH 610N)
Biological NMR Spectroscopy (CH 610B)
Topics in Mass Spectroscopy (CH 610T)
Molecular Modeling (CH 510M)
RNA Catalysis (CH 610)
Chemical Bonding (CH 511)
Prebiotic Chemistry (CH 560)
Advanced Inorganic Chemistry (CH 512)
Advances in Biochemistry (CH 695)
Electronics and Instrumentation for Chemists (CH 524/525)
Advanced Organic Chemistry I (530)
Advanced Organic Chemistry II (531)
Spectrometric Analysis (CH 536/537)
Advanced Spectrometric Techniques (CH 538)
Organic Synthesis (CH 633)
Advanced Topics in Organic Chemistry (CH 634)
Physical Organic Chemistry (CH 635)
Statistical Thermodynamics (CH 665)

Appropriate courses from outside of the Department of Chemistry include:

Cellular and Molecular Biophysics (PH 590)
Microbiology (BI 520)
Molecular Genetics (BI 524)
Theory of Recombinant DNA Techniques (BI 530)
Neurophysiology (BI 562)
Sensory Physiology (BI 563)
Microbial Physiology (BI 581)
Immunology and Serology (BI 587)
Cytogenetics (BI 593)

Students may also elect to do relevant coursework at local institutions such as OHSU/OGI. Potential courses include:

Topics in Advanced Biophysical Chemistry (BCMB 617, OHSU)
Protein Design (BCMB 618, OHSU)

The Molecular and Biochemical Basis of Disease (BCMB 619, OHSU)
Biochemical & Biophysical Properties of Membranes (BCMB 620, OHSU)
Biophysical Chemistry of Macromolecules (BCMB 621, OHSU)
Advanced Molecular Biology and Nucleic Acid Biochemistry (BCMB 625, OHSU)
Bioenergetics and Membrane Transport (BMB532, OGI)
Metals in Biochemistry (BMB537, OGI)
Molecular Genetics of Development (BMB541, OGI)

C. Emphasis in Environmental Chemistry

Basic courses

Expected of students in their undergraduate background or to be taken in the first year of graduate school

Instrumental Analysis (e.g., CH 526, 527)

Core courses

The following courses will be required for all students in the Environmental Chemistry emphasis:

Atmospheric Chemistry (CH 670)
Photochemistry (CH 661)
Chemical Kinetics (CH 662)

Specialized Electives

Students will choose a minimum of three additional courses from the lists of courses below:

Advanced Environmental Chemistry (CH 610)
Advanced Instrumental Analysis (CH 623)
Chemical Sensors (CH 510S)
Laser Applications in Chemistry (CH 510L)
Topics in Mass Spectrometry (CH 510T)
Electronics and Instrumentation for Chemists (CH 524, 525)
Molecular Modeling (CH 510M)
Computational Chemistry (CH 543)

Appropriate courses from outside of the Department of Chemistry include:

Atmospheric Physics (PH 571)
Watershed Hydrology (ESR 525)
Terrestrial Biogeochemistry (ESR 527)
Environmental Data Analysis (ESR 566)
Fate and Transport of Toxics in the Environment (ESR 579)
Geochemistry (G 545)
Chemical Hydrology (G 548)
Global Biogeochemical Cycles (Bi 510)

Students may also elect to do relevant coursework at local institutions such as OHSU/OGI. Potential courses include:

ESE 510 Aquatic Chemistry
ESE 514 Distribution and Fate of Organic Pollutants
ESE 516 Chemical Degradation and Remediation
ESE 554 Biodegradation and Bioremediation

Existing Graduate Courses in Chemistry

CH 511 Chemical Bonding (4 credits)
CH 512 Advanced Inorganic Chemistry (4 credits)
CH 518 Advanced Chemistry Laboratory (4 credits)
CH 524 Electronics and Instrumentation for Chemists (2 credits)
CH 525 Electronics and Instrumentation Laboratory (3 credits)
CH 526 Instrumental Analysis (3 credits)
CH 527 Instrumental Analysis Laboratory (3 credits)
CH 530, 531 Advanced Organic Chemistry (4, 4 credits)
CH 536 Spectrometric Analysis (3 credits)
CH 537 Spectrometric Analysis Laboratory (1 credits)
CH 538 Advanced Spectrometric Techniques (3 credits)
CH 539 Advanced Spectrometric Laboratory (1 credits)
CH 540, 541, 542 Physical Chemistry (3, 3, 3 credits)
CH 543 Computational Chemistry (3 credits)
CH 544, 545 Physical Chemistry Laboratory (2, 2 credits)
CH 560 Prebiotic Chemistry
CH 590, 591, 592 General Biochemistry (3, 3, 3 credits)
CH 593, 594, 595 Biochemistry Laboratory (3, 2, 2 credits)
CH 601 Research (credit by arrangement)
CH 603 Dissertation (credit by arrangement)
CH 604 Cooperative Education / Internship (credit by arrangement)
CH 605 Reading and Conference (credit by arrangement)
CH 607 Seminar (1 credit)
CH 610 Selected Topics (credit by arrangement)
CH 615 Selected Topics in Inorganic Chemistry (3 credits)
CH 620 Selected Topics in Analytical Chemistry (3 credits)
CH 621 Advanced Analytical Theory (3 credits)
CH 622 Trace Metal Analysis (3 credits)
CH 623 Advanced Instrumental Analysis (3 credits)
CH 633 Organic Synthesis (3 credits)
CH 634 Advanced Topics in Organic Chemistry (3 credits)
CH 635 Physical Organic Chemistry (3 credits)
CH 660 Selected Topics in Physical Chemistry (3 credits)
CH 661 Photochemistry (3 credits)
CH 662 Chemical Kinetics (3 credits)
CH 663 Chemical Thermodynamics (3 credits)
CH 664 Quantum Chemistry (3 credits)
CH 665 Statistical Thermodynamics (3 credits)
CH 666 Solution Thermodynamics (3 credits)

CH 670 Atmospheric Chemistry (3 credits)
CH 693 Enzyme Structure and Function (3 credits)
CH 695 Advances in Biochemistry (3 credits)
CH 696 Molecular Structure and Spectra (3 credits)

New Courses

The above offerings represent a comprehensive listing from the basic subject areas applicable to the proposed program. Courses related to specific faculty expertise and student needs will also be offered under the auspices of the 610 Special Topics courses or other similar listings. This vehicle has been used in recent years to add courses to the curriculum such as Molecular Modeling, Polymer Chemistry, Biological NMR Spectroscopy, Fluorine Chemistry, Biochemical Catalysis, Mass Spectrometry, Electronic Materials, Surface Chemistry, and Chemical Sensors.

V. Status in Program

A. Advancement to Candidacy

A student is nominated for advancement to candidacy by the student's approved Dissertation Advisory Committee with the approval of the Department Chair after the student has satisfactorily completed the entrance exam, comprehensive exam, and oral prospectus exam requirements. The nomination is made on the Prospectus Approval form. The student will be informed by the Dean of Graduate Studies of advancement to candidacy.

B. Maintenance of Enrollment in Program

The student must maintain a minimum 3.0 cumulative graduate-level grade point average (GPA) and be enrolled for credit each term of the academic year (unless the student has obtained a leave of absence). If the GPA falls below 3.0 at the end of any term after the attainment of 9 graded units, the student is allowed a probationary **TERM** in which to bring the GPA back to the required standard. The student must also attain a term GPA greater than or equal to 2.67 for any term where more than 6 graded credits are obtained, or be placed on probation. A student on probation may not hold graduate assistantships or be advanced to candidacy, and failure to attain minimum GPA levels in any two terms will result in disqualification (*i.e.*, removal from the graduate program.) Disqualified students may not hold graduate assistantships, register for classes at PSU, or be advanced to candidacy, but may apply for readmission (see PSU Bulletin.)

Students must be registered every term (minimum 1 credit, including summers) while working on any phase of the dissertation (research, writing, revision) through the term of approval of the dissertation by the Office of Graduate Studies and Research.

In addition, the student must make satisfactory progress in research work each year as judged by the Dissertation Advisory Committee through the annual summary reports. If progress becomes unsatisfactory, the committee may recommend to the Department Chair that the student be dismissed from the program. A copy of this recommendation will be transmitted to the student.

C. Maintenance of Graduate Assistantship

The student must enroll in and successfully complete 9-16 graduate level credits each term. Course audits are not counted as credits. Assistants are expected to devote full time to their studies, teaching and research duties. Students may **not** hold any outside employment while on assistantships (research or teaching) without expressed consent of the Department Chair and the Graduate Admissions and Advising Committee. This consent must be obtained by the Research Adviser on the student's behalf. Violation will result in loss of eligibility for assistantship support. In addition, the student must perform teaching duties satisfactorily each term in order to qualify for reappointment by the Department Chair. Students will only be supported on teaching assistantships for a maximum of five (5) calendar years. A special *one term* extension may be granted by the Graduate Admissions and Advising Committee and the Department Chair following petition by the Research Adviser on the student's behalf.

D. Residence Requirement

The student must spend at least three consecutive terms in full-time (at least 9 credits per term) residence at Portland State University after admission to the doctoral degree program. A minimum of three years in graduate study is also required. The student must complete 27 credits of dissertation research under CH 603 after advancement to candidacy.

E. Leave of Absence

Under special circumstances, requests for a leave of absence of up to one year may be approved by the Department Chair in consultation with the student's Research Adviser or the Graduate Admissions and Advising Committee. *Such applications must be filed with the Office of Graduate Studies and Research no later than the last day to register for classes in the term in which the request is made.* No more than **TWO** leaves of absence will be approved and such leaves are included in the five year time limit after advancement to candidacy for completion of the degree. Only students in good academic standing can be granted a leave of absence.

F. Withdrawal / Change to the M.S. Program

Any student who ceases to be enrolled for more than **ONE** academic term without formal leave of absence will be assumed to have withdrawn from the degree program and will no longer be enrolled by the Chemistry Department. The student can be readmitted only with the consent of the Graduate Admissions and Advising Committee.

Students wishing to change to the M.S. degree program should file an M.S. degree program admission application with the Graduate Admissions and Advising Committee and consult with the Department Chair. Once the change has been approved, the student would be required to reapply to the Ph.D. program, as would any other student, so this change is not generally advisable. The two year time limit for assistantship support for the M.S. degree would also include any time spent on support in the Ph.D. program. Note that Ph.D. students have the option of preparing and defending an M.S. thesis during the progress toward the dissertation, with the Research Adviser's consent.

G. Completion of Program

The awarding of a degree during a specific term involves the following steps which must be met by certain deadlines. Exact due dates are posted in the Office of Graduate Studies and Research but it is advisable for the student to finish the requirements well ahead of the deadline to allow leeway for unexpected delays. All of the forms below should be turned in to the Office of Graduate Studies and Research by the posted deadlines. Any Incomplete or In Progress grades (except 603) must be removed no later than two weeks before graduation.

<u>Form</u>	<u>Deadline</u>
Application for Advanced Degree	First Friday of term of graduation.
GO-17D Recommendation for the Degree of the term of graduation. following approval by the Dissertation Advisory Committee)	Friday, three weeks before the end (submitted by the Chemistry Department)
Microfilm Agreement Form (to be accompanied by an Abstract, less than 350 words in length) and \$55 fee	Submitted with dissertation.
National Research Council Survey of Earned Doctorates	Submitted with dissertation.

VI. APPENDIX A

A. Summary of Responsibilities

The following summary of responsibilities of the various people and entities involved in the Ph.D. program in Chemistry is intended to serve as a quick reference guide and may not be considered all-inclusive or binding. It is still contingent upon the students and advisers to acquaint themselves with the particulars of their duties.

Student's Responsibilities:

It is the student's responsibility to acquaint themselves with all of the requirements associated with the various levels of governance (University, Chemistry Department) of their graduate program. This document and the Chemistry Program Guidelines along with the University Bulletin should be considered the primary source of information. Additional information, including answers to specific questions and term specific deadlines, can be obtained from the Chemistry Department, and the Office of Graduate Studies and Research.

Specific responsibilities include: 1) Preparation for and successful completion of all of the requirements listed above. 2) An initial individual literature search of material applicable to the proposed research and 3) An ongoing familiarity with recent developments in the field. 4) Competent independent execution of the research project. 5) Preparation and presentation of the dissertation.

Research Adviser's (RA) Responsibilities:

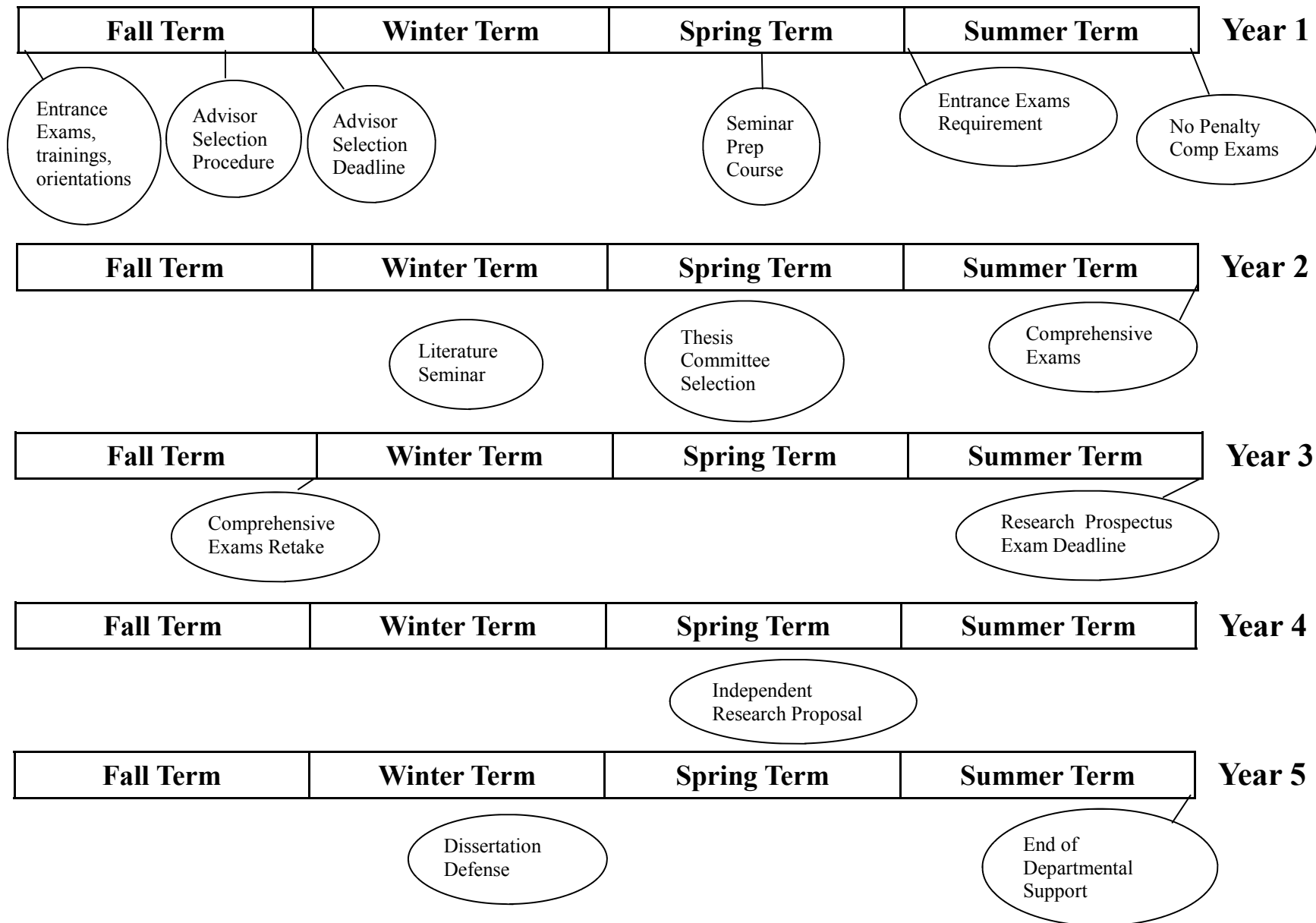
- 1) Primary advising of the student in terms of both the course of study and the research project. The RA should thus be aware of the coursework requirements of the degree program.
- 2) Advising and assisting in the selection of topic and preparation of the Literature Seminar, the Research Prospectus, the Independent Research Project (obviously to a lesser degree) and the Dissertation. Scheduling of the latter three exams.
- 3) Assisting the Department Head in the selection of the Dissertation Advisory Committee.
- 4) Filing the Annual Summary reports, and the Graduate Office forms (especially GO-16D and 17D.)

Dissertation Advisory Committee (DAC) Responsibilities:

- 1) Oversee the student's progress in the degree program.
- 2) Provide advice regarding the preparation of the research prospectus, independent research proposal and dissertation.
- 3) Provide final approval of the student's course of study, research prospectus, independent research proposal and dissertation.
- 4) Administer the oral research prospectus exam, independent research proposal presentation and dissertation defense.

B. Project Timeline Summary

Chemistry Ph.D. Program Summary Timeline



VII. APPENDIX B

A. Forms Required for Chemistry Ph.D. Program (copies included)

Selection of Research Adviser (also available on the Chemistry website listed below & in the Chemistry Office)

Quarterly Progress Report (also available on the Chemistry website listed below& in the Chemistry Office)

Comprehensive Exam Form (available in the Chemistry Office)

GO-16D Appointment of Final Oral Examination Committee (also available on the GSR website listed below and in the GSR Office)

Independent Research Proposal (also available on the Chemistry website listed below & in the Chemistry Office)

GO-17D Recommendation for the Degree (also available on the GSR website listed below and in the GSR Office)

Additional, more specialized forms and digital versions of these forms (which can be downloaded, filled out, and printed from your computer) are available at the following URL's.

<http://chem.pdx.edu/resources.html>

http://www.gsr.pdx.edu/ogs_forms.html