

## GENERAL REQUIREMENTS AND DEPARTMENTAL POLICIES for GRADUATE STUDENTS IN CHEMISTRY at the UNIVERSITY OF IDAHO (Revised August 2022)

The Chemistry Department of the College of Science offers graduate programs leading to the thesis degrees Master of Science and Doctor of Philosophy in chemistry. A program leading to non-thesis degrees, Master of Science is also available.

This descriptive document is intended for the guidance of faculty, staff and graduate students. It deals with specific departmental rules and procedures and is not intended to duplicate the information included in the University of Idaho and College of Graduate Studies bulletins.

### Qualifying Examinations

Entering graduate students (M.S. or Ph.D.) take graduate qualifying examinations in the areas of analytical, inorganic, organic, and physical chemistry. These ACS standardized examinations are offered immediately prior to the first week of the Fall and Spring semesters and must be taken at the first offering after the student's arrival. Questions are at an advanced undergraduate level. Before enrollment in a 500 level course in any chemistry subject area is permitted, the student must have demonstrated proficiency by one of the routes given below.

- 1) Students who score at or above the 50th percentile (established nationally) on a specific qualifying examination may begin immediately with a 500-level course in that area. In addition, scores at or above the 50th percentile for the individual qualifying examinations in analytical, inorganic, organic and physical chemistry will entitle enrollment in Chem 455, 466, 476 and 496, respectively. A score in the 50 to 69th percentile range will result in a B grade for the corresponding 3-credit Survey of Chemistry course(s), while a score at or above the 70th percentile will result in an A grade.
- 2) Students scoring below the 50th percentile on a qualifying exam will begin course work with the appropriate course(s) from the following:
  - Analytical: Chem 454
  - Physical: Chem 495
  - Inorganic: Chem 463 or 464
  - Organic: Chem 473
- 3) Students scoring below the 30percentile on a qualifying exam will enroll in the corresponding Survey course (Chem 455, 466, 476 or 496) and will be directed to do additional remedial work under the aegis of that course. They are required to take the standard remedial courses (as listed under (2) above) subsequent to this.

### Teaching Requirement

All candidates for the M.S. or Ph.D. degree in Chemistry are required to obtain teaching experience, here or elsewhere, as a part of their training. Also, all Teaching Assistants must complete Chemistry 506 (Introduction to Teaching and Research Skills) successfully.

### Course Work

All M.S. and Ph.D. candidates are expected to complete the required minimum of credits of course work as soon as possible. Students will normally take at least nine credits of course work in each of the first two (M.S.) or three (Ph.D.) semesters. For Ph.D. candidates who pass all four qualifying exams, it is possible to complete the minimum course work requirement during the first two semesters. However, such qualified students are encouraged to take additional courses that are appropriate to their interests and graduate program. All graduate students will enroll in Seminar (501 or 511) each semester in residence. With the exception of the semester(s) when a seminar presentation is made, enrollment will be for zero credit (P or F), with attendance mandatory.

### MASTER OF SCIENCE PROGRAM

During the second semester of attendance, a program outlining the work to be completed to fulfill the requirements for the degree should be prepared by the student in conference with his/her major professor. This program must be approved by the major professor and must be submitted for approval to the Dean of the College of Graduate Studies as soon as practical.

### Candidacy and Application for a Degree

#### A. Thesis Option

- 1) Credit and Course Requirements. The student must complete a minimum of 30 credits of approved graduate work, including a thesis, and at least 18 credits must be in courses numbered above 500. One credit must be earned in Chemistry 501. Not more than 10 credits in research and thesis may be included in the required minimum.
- 2) Qualifying Examinations. See page 1.
- 3) Research and Thesis. Each candidate for a thesis degree must carry out an acceptable piece of research work which is to be reported in the form of a thesis written in accord with regulations of the College of Graduate Studies. The thesis must be completed and deposited in the College of Graduate Studies office by the appropriate deadline of the academic term in which the student expects to receive the degree. The thesis may consist of one or more papers based on the research of the M.S. candidate, which have been published in or accepted for publication by reputable, refereed journals.

Final Examination. In accord with College of Graduate Studies regulations, upon submission of the thesis to the College of Graduate Studies, the student is required to take a final oral examination. A draft of the thesis must be presented to the candidate's committee at least 10 working days before the scheduled date of the oral examination. The examination is conducted by the student's thesis committee, which is named by the student and his/her advisor with the approval of the College of Graduate Studies, and covers the thesis and other subjects at the discretion of the committee. Examination authorization forms are obtained from the College of Graduate Studies office. A recommendation of a majority of the committee is necessary for a candidate to pass. If failed, the examination may be repeated once in accord with the regulations of the College of Graduate

Studies.

#### B. Non-Thesis Option

- 1) Credit and Course Requirements. A minimum of 30 credits in course work is required and must be divided among the following: (a) 20 credits in chemistry courses numbered 500 and above (including 1 credit in Chemistry 501); (b) 10 credits either in chemistry 400-numbered courses or above, or in related courses numbered 300 or above.
- 2) Qualifying Examinations. See page 1.
- 3) Comprehensive Examination. This is an oral and/or written examination that covers graduate course work. It is conducted by the student's graduate committee and must be taken during the student's final semester in residence. The examination, if failed, may be repeated once in accord with the regulations of the College of Graduate Studies.

#### DOCTOR OF PHILOSOPHY PROGRAM

The study program for the first, and possibly second, semester in residence is arranged in consultation with the Department Chair or the chair of the departmental Graduate Studies Committee. The student is encouraged to discuss research problems with faculty members in his or her field of interest and to select a major professor by no later than the end of his/her first academic year in residence. The student then selects committee members in consultation with his/her major professor.

The selection of a major professor is the single most important decision reached by a graduate student. This should be made only after adequate discussion of research projects with faculty members. While this is a very serious decision, it should not be considered irrevocable.

If it is in the best interest of either the professor or the student for the student to change major professors, the student, the professor, and the Department Chair will be notified in writing of the proposed change by the initiator.

The student must fulfill all reasonable obligations to the first major professor to the satisfaction of the Department Chair before he/she is free to transfer. These obligations include, but are not limited to, cleaning the work area and equipment, returning all notebooks, equipment and chemicals to a location specified by the major professor, and submitting a final report. In the event that a student is terminated for cause by a major professor as indicated by a memo to the Department Chair, the Graduate Studies Committee will conduct an immediate evaluation of the student prior to any reassignment. The Department Chair will serve as the student's advisor until a new major professor is chosen. In extreme cases, the Graduate Studies Committee may recommend to the departmental faculty that the student be dismissed from the graduate program.

#### 1) Appointment of Major Professor and Committee

In consultation with his/her advisor, the student should select committee members soon after the completion of one full year of graduate work. The student then submits the form "Appointment of Major Professor and/or

Committee” to the Vice President for Research and Graduate Studies.

2) Study Plan

Shortly after the supervisory committee has been appointed, the student and the major professor prepare a study plan, which must then be approved by the supervisory committee and the Dean of the College of Graduate Studies. (See Chemistry Course Requirements for Ph.D. Degree.)

3) Examinations

In addition to the qualifying examinations, three other types of examinations must be completed satisfactorily.

- a) Comprehensive Examinations. Comprehensive examinations (comps) are administered in the month of December, at the end of a Ph.D. student’s third semester of residence in the department. A list of comp titles is made available to graduate students when they arrive in the department, and each student is given the opportunity to choose 4 exam titles on which he/she wishes to be examined. Students must inform their major professor and the Department Chair of their choice no later than the month of May of their first year. They are encouraged to study the material relevant to their chosen topics during the year.

Each comp exam is worth 100 points, for a maximum score of 400 points total. The overall passing grade is 50%, *i.e.* 200 points. Once a student reaches 200 points (after 2, 3, or 4 exams), he/she has passed the comps. If a student does not reach 200 points after 4 exams, he/she fails and cannot continue in the PhD program.

- b) Oral Examination. Students are required to complete Chem 590, “Doctoral Research Proposal,” no later than third year of study. In this course, the student prepares a written research proposal based on his/her doctoral research project and defend it at an oral examination by his/her committee. The proposal is limited to a maximum of 5,000 words, excluding the bibliography, and consists of a) a statement of the proposed doctoral research problem, b) an in-depth discussion of the relevant literature, c) a listing of major research objectives, d) a summary of the proposed experimental work plan, and e) an appropriate bibliography. After approval by the student's research advisor, this typed proposal is circulated to the student's graduate committee. A date and time is then selected for the oral examination. This examination is normally taken during the student's fifth semester. The format of the oral examination is an initial, concise presentation (not to exceed 15 minutes) of the research problem and proposed approaches, followed by a question and answer period. Then, the student's graduate committee meets privately to assess the student's demonstrated understanding of both the general research area and the specific research project. The committee's pass/fail decision is based on each committee member's perception of the student's knowledge and preparedness for the proposed research. A simple majority of the committee's vote defines the pass/fail decision. In case of a tie vote, the decision will be to pass, provided the student's research advisor voted to pass. In case of a tie vote where the research advisor has voted to fail, the

committee's decision will be to fail. On those (hopefully rare) occasions of a negative decision, the committee will offer constructive suggestions to guide the student toward the desired performance level. The student will then be given an opportunity to repeat the oral examination. This second oral examination is the student's final chance to attain a passing grade and should be held within 90 days of the first examination.

- c) Final Examination. This is an oral examination that focuses on a final defense of the dissertation and any other subjects deemed pertinent by the supervisory committee. It is scheduled upon completion of the dissertation and after authorization forms have been issued by the College of Graduate Studies, but not earlier than 10 working days after approval by the College of Graduate Studies to schedule the defense. A recommendation of a majority of the committee is necessary for a candidate to pass. If failed, the examination may be repeated once in accord with the regulations of the College of Graduate Studies. Following a successful defense, the candidate must submit the final copies of his/her dissertation within six months of the examination date.

4) Seminar

Two credits of seminar, Chem 501-02, are required of all Ph.D. candidates. Each involves an oral presentation of approximately 45-50 minutes and is followed by a 10-15 minute period for questions. The first seminar is concerned with material from the literature that is not directly related to the specific dissertation research project, while the second is on the subject matter related to the dissertation. The entire faculty decides if a seminar presentation is satisfactory by assigning grades. The student will have to repeat any seminar if the average grade is below a C.

5) Admission to Candidacy

After successfully taking comprehensive examinations, passing one seminar, and completing the oral examination requirement, the student is eligible for formal admission to candidacy for the Ph.D. degree. The student shall then submit the form, "Report of Preliminary Examination and Advancement to Candidacy" to the Dean of the college of Graduate Studies.

6) Chemistry Course Requirements for Ph.D. Degree

The curricular outlines below may be modified at the discretion of the Graduate Studies Committee if the student has passed with a grade of B or better in an equivalent course elsewhere.

As a minimum departmental requirement, each student will take 20 credit hours of 500-numbered courses in the Department of Chemistry in addition to Chemistry 506 (2 credits) and Chemistry 590 (1 credit). All students will take Physical Chemistry 509 (3 credits) and obtain two credits for seminars in Chemistry 501. The remaining obligatory 15 credits can be taken in chemistry courses approved by the student's advisor and graduate committee. Typically, a student would acquire these 15 credits by taking three 500-level courses in his/her subdiscipline and two 500-level courses outside the subdiscipline. However, this course

distribution is not mandatory because of the department's desire to allow a plan of study that is most appropriate for an individual student's interests and program.

Each student will enroll for a minimum of 33 credit hours in courses. That is, the preceding courses for 21 credits plus 12 credits obtained from taking the appropriate selection of Survey of Chemistry courses (Chem 455, 466, 476 and 496 for passing the qualifying examinations), and/or the alternative remedial courses (Chem 454, 463, 473, and 495, respectively). The student is encouraged to take additional courses beyond the minimum requirement in either chemistry or related fields, e.g., mathematics, physics, computer science, geochemistry, agricultural sciences, material science, biochemistry, and engineering. In addition, sufficient credit hours of research (Chem 600) must be completed to meet the minimum total registration requirement of 78 credits as specified by the College of Graduate Studies.

#### 7) Grades

Grades of C may be offered for the Ph.D. requirements for courses listed on the study program. These must be averaged with an equal number of credits of A.

#### 8) Research and Dissertation

The Ph.D. degree in chemistry is primarily a research degree. Therefore, the research project constitutes the most important single aspect of the student's work. The research must lead to an original contribution to knowledge and be of sufficient value to warrant publication in the scientific literature. A detailed report of the research activity is submitted to the College of Graduate Studies in the form of a dissertation in accord with College of Graduate Studies regulations (see link below). The dissertation may consist of papers based on the research of the Ph.D. candidate, which have been published in or accepted for publication by reputable, refereed journals.

<https://www.uidaho.edu/-/media/Uidaho-Responsive/Files/cogs/BrochuresHandbooksGuides/Thesis-and-Dissertation-Handbook.pdf?la=en&hash=11513DDBC9086F197CE082BC9C6EAC56FE74426D> [www.uidaho.edu/COGS/](http://www.uidaho.edu/COGS/)

#### 9) Evaluation of Teaching Assistants

Late in the second semester of each academic year, the faculty meets to evaluate all teaching assistants and determine if departmental financial support will be offered for the next year. The evaluations is based on the student's performance in courses, cumulative exams, seminars, research and teaching.

Major professors may be asked to submit a brief written statement of the student's research performance during the preceding semester. When applicable, faculty supervisors may be asked to submit a brief written assessment of the student's performance as a teaching assistant.

#### 10) Right to Petition

Departmental rules set forth in this bulletin may be challenged by petition to the Graduate Studies Committee of the Chemistry Department.