

08/16 revision

# **STUDENT HANDBOOK CHEMISTRY PhD PROGRAM UNIVERSITY OF ROCHESTER**

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## **Introduction**

This booklet describes the requirements for the PhD degree in chemistry at the University of Rochester. The following requirements have evolved to foster the development of creative, independent-thinking chemists ready for a career in the chemical sciences. Chemistry is a central science that overlaps with every other area of physical and biological sciences, and a firm education in chemistry provides the quantitative and conceptual skills that enable a researcher to make scientific advances. Our program develops the practices that make one an effective researcher: how to obtain knowledge through texts, journals, and research; formulation of new research questions; and critical evaluation of research. We recommend that students view these rules and regulations with their long-range goals in mind.

The University also publishes *Regulations and University Policies Concerning Graduate Study* (<https://www.rochester.edu/GradBulletin/>), which provides general requirements for all graduate degrees. If you have questions or concerns about the program, please contact the Graduate Studies Coordinator in Hutchison Hall 471, (585) 275-0635.

### **A. Stipend And Other Support**

Graduate students in Chemistry are financially supported by a stipend, which is intended to defray living expenses so that they may devote full time to their research and not have to work outside of the University. The department also pays the mandatory university health fee (\$528), which covers visits to the University Health Service and the University Counseling Center. The only university fee that the student is responsible for is the graduate student activity fee (approximately \$10 per semester) charged to the student bill. In addition, the University requires that all graduate students have health insurance; the department does not provide major medical insurance. The student may be eligible for parental insurance coverage or may purchase health insurance either privately or through the University. If the student chooses to purchase University health insurance, they have the option of having the fee deducted from their stipend or being billed directly.

All students receive the stipend for the full time they are pursuing their PhD degree, up to five years. The amount of the annual stipend for graduate students is adjusted from time to time to account for inflation. The funds for the stipend come from the University when a student is a teaching assistant (TA), and from the research director(s) at other times. Some students may earn external fellowships, in which case the department will conform to the fellowship requirements.

The primary mode of education in graduate school is through research, making graduate school very different from undergraduate work. First, education is not limited to times when courses are in session. Second, your progress is measured in terms of your work output. Therefore, vacation time is coordinated with a student's Research Director, and is not related to the beginning and ending of semesters. Typically, graduate students are permitted two weeks of vacation time (10 business days) each calendar year (January 1 through December 31). Vacation time does not accrue and roll over from year to year unless the advisor gives express written consent. Specific vacation policies may vary between faculty research advisors, so specific policies should be clarified between student and advisor once the student has joined a research group.

Students are expected to focus on PhD work full-time, and secondary employment, including summer internships, is not appropriate unless it is a part of the PhD project. Graduate students must report outside employment of any kind to both the Department Chair and the student's Research Director. Absences of more than several weeks in the course of a year are detrimental to a student's research progress and may violate the requirements of the funding agencies that provide the source of the research stipend; as such, absences from the University require the approval of the student's Research Director and the Graduate Studies Committee.

Sometimes students begin research in the summer prior to their first fall semester, which enables them to become familiar with the department before classes start, and to experience one or several research groups (rotations through several groups over the summer/first semester of a student's residence at the University can be arranged by contacting the directors of these groups). The student is not obligated to do PhD research in the same group after the summer rotation period nor is the advisor obligated to accept the student into their research group. The student matriculates early, and enrolls in CHM 595 (PhD Research in Chemistry) for 6 or 12 credits, depending on the date that they start in the summer. Their stipend during this time is paid by the summer research director, and is prorated from the current stipend level according to the length of time that they are working during the summer.

Students also receive a \$1,000 professional allowance when they enter the program, and the department provides \$500 toward attendance of a regional, national, or international conference related to their PhD research.

## **B. Research Director and Thesis Advisory Committee**

Graduate students select a faculty member to be their research director at the end of their first semester. This research director may be from the Chemistry Department, or an affiliated faculty member in a Research Cluster. Faculty members in other departments may be chosen with the permission of the Chemistry Department; in these cases, it is important that the proposed PhD topic falls under the broad definition of chemistry. In collaborative projects, it is acceptable to have joint research directors. In these cases, the specific obligations of each research director toward the financial and scientific progress of the student should be determined in advance, and provided in writing to the Graduate

Studies Committee.

The first semester is allocated for students to gain familiarity with the range of projects underway in the Department. During Orientation Week, faculty members give short seminars to introduce their research. Later, more detailed information should be gained by reading their papers, talking to current students, attending group meetings, looking at Web pages, and most importantly having individual discussions with the faculty member. In October of the first year, graduate students submit a list of the faculty members with whom they would like to discuss research projects in more detail to the Graduate Studies Coordinator. The student should then initiate meetings with each of these faculty members to discuss their interest and potential projects in each of their research groups. It is important that students realize that they are responsible to direct this process independently. Choice of research director is of utmost importance in a student's career and they should place a high priority on researching potential research advisors in their first two months at the University.

Before the announced deadline (near the Thanksgiving break), students submit their top three choices of research director to the Graduate Studies Coordinator and the Graduate Studies Committee chairperson. **Prior to submission of their choice, students should meet with their top choice of potential research director and inform her/him of their choice.** While the faculty member cannot yet formally accept the student, the faculty member will typically inform the student whether or not they are likely to accept the student into their research group. In most years, all students get their first choice; occasionally a faculty member declines a student because they cannot provide financial support, or because there is a necessity to avoid a highly unbalanced distribution of students among faculty. The distribution of incoming students into research groups is approved by a faculty vote in the December faculty meeting, and then the research director assignments are official. Students begin their PhD research immediately thereafter.

The research director is the student's adviser on academic matters, and may require that the student take or audit such courses as he/she deems necessary for the student's development. The student furnishes reports on research progress, as required by the research director. This is a mentor/mentee relationship that often lasts throughout the student's entire research career, long after leaving Rochester.

A student also gets advice and feedback from the Thesis Advisory Committee, who administers the Oral Qualifying Exam, gives feedback on the Third Year Seminar, contributes to the Fourth-Year Review, and makes up part of the PhD Thesis Committee. At the end of the first year, students submit several preferences for the faculty members to be on this committee, and the Graduate Studies Committee makes assignments based on the students' preferences and the need for equal distribution of advisory assignments between faculty members. The faculty members on this Thesis Advisory Committee are an important resource for the graduate student for advice, second opinions, and ideas. When a student is applying for special fellowships and for further employment, she/he typically needs 2-3 recommendation letters: developing a mutual familiarity with the faculty on her/his Thesis Advisory Committee is a good way to build these relationships.

Students contemplating changing research directors should first discuss the issues with their current research director. If it appears that no mutually agreeable resolution can be reached, the student writes a letter to the Chair of the Graduate Studies Committee (GSC) indicating the desire to find a new research director, along with a statement of future plans. It is the obligation of the student to review research materials with the research director and to attempt to finish any short-term projects before departure. The student and

research director must inform the Graduate Studies Administrative Assistant (HH 471) of the date on which the student will be leaving the lab (regardless of whether the student is staying in the Department or leaving the University).

If a faculty member leaves the University, a student in good standing in that research group has several options. Students who have just started research may choose to remain in the Department with a different research director and project. For students who are at a more advanced stage in their PhD research (e.g., have completed the Qualifying Exam and have made substantial progress on a project), continuation on that thesis project may either be *in residence* or *in absentia*. Students remaining in residence must have a sponsoring laboratory in which their research can be conducted. Written notification of this arrangement must be sent to the Chair of the Graduate Studies Committee and must be approved by the departing research director, the head of the sponsoring laboratory, and the Chair of the Graduate Studies Committee. Students who move with their adviser and complete work *in absentia* retain their Thesis Advisory Committee. In either case, the final thesis is registered and defended at the University of Rochester. University rules regarding the completion of the degree *in absentia* are in the *Graduate Bulletin*. A student may also apply to transfer to the new institution.

A faculty member may resign as a student's research director if the student is making unsatisfactory progress toward their PhD. The faculty member must discuss the situation with the chair of the Graduate Studies Committee or the Chair of the Chemistry Department prior to resigning as faculty research director. The student then has 60 days to find a new research director, who contacts the Graduate Studies Director to make the new advisory situation official. A student who is unable to find a new research director within 60 days leaves the Program.

### C. Courses

Graduate courses are intended to give the student the in-depth knowledge necessary for working at the forefront of chemical research. *Students must complete a minimum of 20 credits (5 semester-long courses) within the first two years of graduate study.* The courses may be any combination of graduate-level (4XX) courses, as long as the courses selected provide an appropriate background for completion of the thesis research. Courses from other departments such as physics, optics, biology, biochemistry, and pharmacology may be included with the permission of the Research Director or Chair of Graduate Studies. A student should not ordinarily exceed 12 credit hours of courses in other departments, and should make sure that they have sufficient background for extra-departmental coursework.

Students with prior graduate experience may use their prior courses toward the course requirement only if they received an "A" at the other institution. Grades below an "A" indicate that the student would benefit from further study of the material. Because courses are not necessarily equivalent at different schools, a syllabus from the previous course needs to be submitted to the Graduate Studies Committee before reduction in the course requirements can be considered.

1. Formal Course Offerings – The Department maintains a list of graduate-level courses (CHM 4XX) within the Chemistry Department. The available courses offered vary from year to year, depending on faculty resources. This list is also available online at <http://listener.uis.rochester.edu/csched/>

Full-semester (14-week) courses are worth 4 credits. A number of graduate courses are

"modular" half-semester (7-week) courses that are worth 2 credits. The split between these classes is after 7 weeks, which falls 2 weeks after the "fall break" in the fall semester, and at spring break in the spring semester. Modular courses are designed as such to allow students additional flexibility in their course choices. Students should register at the beginning of the semester for courses that take place in the last half of the semester.

## 2. Grades in Graduate Courses

Grades for graduate courses (and research) are reported using one of two systems, either grades (as shown below) or S (satisfactory) / E (failure).

A Excellent	S Satisfactory
A-	I Incomplete
B+	IE Incomplete and failure
B Good	W Withdrawn
B-	N No report
C Poor	E Failure

To remain in good academic standing, a student must earn a B- or better in all courses. A letter grade of C in one course automatically places the student on academic probation. A student with a letter grade of E or two letter grades of C is considered to have an unsatisfactory record. In such an event, the Graduate Studies Committee reviews the student's records to determine whether the student may remain in the graduate program.

Students should be aware that they receive a tuition waiver for each semester that they are in the graduate program. If a student exceeds the number of allowed credits, or audits a course outside the College, they can be billed for the excess tuition. Consult with Robin Cooley before registering for any course outside of chemistry.

## 3. Special Course Requirements

*Chemistry Seminar and Colloquium* – All students must register each semester for chemistry seminar/colloquium (see course numbers below). Students are expected to attend these seminars regularly. The section for which the student registers depends on their year in the program, as well as the number of credit hours that they have accumulated. Questions should be directed to the Graduate Studies Coordinator.

**First Year Students:** First year students register for CHM 511 (Chemistry Seminar) for one credit and CHM 513 (Chemistry Colloquium) for zero credits. It is also highly recommended, but not required, that incoming graduate students register for CHM 585 (First Year Seminar) for the fall and spring semesters of their first year, for one credit hour. The First-Year Seminar meets every other week, and is a special discussion on teaching and other challenges of graduate studies. CHM 585 is graded S/E (based on attendance).

**Second Year Students and Beyond:** Students who have completed their first year register for CHM 583 (Advanced Chemistry Seminar & Seminar) for zero credits.

*PhD Research in Chemistry* – Students register each term for a sufficient number of credit hours of CHM 595 (PhD Research in Chemistry) to bring the total credit hours for the term to 12 credits, until a total of 90 credits are achieved. A faculty member must be indicated when registering for CHM 595 by choosing the CRN for their research director. During the first semester, students should choose the Graduate Studies Committee Chair since they do not have a research director yet. During the first year, if the total number of

credits is over 12 hours, it is essential to ask the Graduate Studies Coordinator to request permission for a tuition waiver from the Dean; this must be done in order to avoid tuition charges.

*Doctoral Dissertation* – After students accumulate 90 total credit hours, they register for Doctoral Dissertation. Students in their fourth year register for CHM 997. Students in their fifth year register for CHM 999. Both of these courses carry zero credit hours, but give the student full time status.

*Auditing and Sitting In* – Audited courses do not apply toward the 20 credit-hour course requirement. Although auditing and “sitting in” on courses does not satisfy the PhD course requirements, it allows a student to gain exposure to areas of interest. To audit a course, a student must first obtain the approval of the Dean of Research and Graduate Studies. To obtain this approval, a student must obtain a petition from their advisor indicating why the course is beneficial to their studies and/or research. This petition is submitted to the Chair of the Graduate Studies Committee. If approved by the Chair of the Graduate Studies Committee, the petition is forwarded to the Dean of Research and Graduate Studies. Approval of the Dean prior to the start of the semester is required. If this procedure is not followed, the student is billed for the course.

As an alternative to formally auditing a course, Chemistry graduate students often "sit in" on courses. No formal approval is required to "sit in," but the student should seek permission from the instructor.

#### **D. Teaching**

All graduate students participate in the Department’s teaching program, which enables graduate students to develop essential communication and leadership skills as teaching assistants (TAs). For this purpose, there are several hours of TA training provided, and teaching techniques and concerns are addressed as part of this training. TAs are formally evaluated by the faculty member overseeing the course, and informal feedback from fellow graduate students and from the students in the course being taught is highly useful as well. Outstanding performance is rewarded with special teaching awards each spring. Teaching performance is taken into consideration when the Graduate Studies Committee reviews students for fellowships.

Students are responsible for a total of six units of teaching, where a unit represents roughly one lab, workshop, or recitation per week. A *typical* teaching assignment consists of two units of teaching during the first semester, two units during the second semester, and two units in either the first or second semester of the second year. Students entering the program from another graduate program at an institution within the U.S. may request that prior teaching experience be applied toward the teaching requirement.

A graduate student who fails to perform assigned teaching responsibilities at an acceptable level receives a note describing the problems from the faculty/staff member with immediate responsibility. A copy of this letter is placed in the TA's file, and will be taken into consideration in fellowship decisions. If the TA feels that the charge is unwarranted, they can respond in writing and the issue is referred to the Graduate Studies Committee, who may remove the letter from the student’s file. Upon a second offense, another letter is placed in the student's file, any fellowship held by the student is cancelled, and the student is not eligible for future fellowships. Mediation by the Graduate Studies Committee is again available. On a third offense, the student is placed on probation. For a student on probation, any further offense leads to a recommendation for dismissal from the Chemistry graduate program. For an especially egregious breach

of professional behavior, appropriate action (up to and including a recommendation for dismissal) may be taken by the Department or University. Additional information on the consequences of misconduct is given in the University Bulletin on Graduate Studies.

## **E. Qualifying Examinations for PhD Candidacy**

### **1. Written Qualifying Examinations**

Written qualifying exams (commonly referred to as cumulative exams or "cumes") are given on a monthly basis. These examinations are based on material from undergraduate course work, first-year graduate course work, seminars, colloquia, and the literature. These examinations stimulate review of past and current materials, and are designed to encourage reading of current literature.

Monthly examinations are given in biological, inorganic, organic, and physical chemistry subject areas; cumulative examinations may be given in nuclear chemistry up to six times a year as needed. The style and content of these exams varies by subject area. For example, some subject area exams may be based on an announced topic or on a provided paper while other subject area exams may test students more broadly on unannounced topics. Students should check outside Hutchison Hall 471 for topics and/or readings. Previous examinations are available from the Graduate Studies Coordinator. Students may choose which subject exam to take based on subject area or on affinity for the exam style. Students may take any subject exam in any given month regardless of the student's research group focus. Each student may submit only one examination each month.

The grading system for each exam is: A, which gives one pass-point; B, which gives one-half pass-point; and E, which gives no pass-points. The student has completed the requirement for the written qualifying examination successfully when he/she has accumulated four pass-points, with at least one grade of A.

First-year students entering in September may begin the cume series any time between October and April of their first year by notifying the Graduate Studies Coordinator. During this time, students have the option of taking the cume exams for either practice or for credit. Once they begin taking exams for credit, they have officially started the process and must take the cume exams for credit each month thereafter. All first year students must start taking the cume exams for credit in April of their first year. They then have *twelve consecutive months* to obtain the necessary four points (including at least one grade of A) to satisfy the cume requirement. On occasion, students may be unable to take a cumulative exam. Students may request an excused absence in advance of the exam date and, if approved by the Graduate Studies Coordinator, the 12-month period is extended by one month.

Upon successful completion of the written cumulative examinations, students are eligible to take the oral qualifying exam.

The Graduate Studies Committee carefully examines the records of the students who do not succeed in meeting the above requirements. If the record shows strong promise in course work, teaching, and research, and the student has the support of their research advisor, he/she may be given three additional chances to complete the requirement. If the record does not show strong promise or they are not supported, the student is not permitted to continue for the PhD

Any student who has not successfully completed the written qualifying examination (four points on the cumulative examinations, including the additional attempts) can appeal for

admission to PhD candidacy with the approval of his/her research adviser. (See "Appeal for Admission to PhD Candidacy.")

A student who earns a total of three points in the regular cumulative exam system (12 tries) has satisfied the final comprehensive exam for the Plan-B Master's degree and is eligible to receive a Master's degree upon satisfactory completion of his/her course work. A student who does not receive three points in the cumulative exam system is evaluated by the GSC and may be able to obtain a Master's degree by completing a Master's essay or thesis.

## 2. Progress Reports on First Year Graduate Students

The GSC meets each summer to evaluate the progress of graduate students after their first year. Course grades, cumulative exam record, and research progress to date are examined. Students who are performing below acceptable PhD standards may be asked to leave the PhD program. The GSC notifies students terminated from the Ph.D program whether or not they may complete a Masters degree. The departmental stipend, however, terminates upon leaving the PhD program.

## 3. Oral Qualifying Examination

The Oral Qualifying Examination for admission to PhD candidacy takes place in a student's second year of the program. The purpose is for the student to demonstrate: (1) understanding of the background of the PhD project and of their preliminary results, (2) knowledge of the chemical principles underlying the project, and (3) the ability to formulate the goals of the PhD project, and how she intends to reach these goals.

The exam is administered by the Thesis Advisory Committee (the student's research director and two other Chemistry faculty members appointed by the GSC). It cannot be scheduled until the student has accumulated 30 credit hours (including at least 24 credits of courses and seminar). When the student is ready to schedule his/her oral examination (typically between April and June of the second year), he/she should follow this checklist:

\* **5 weeks prior to exam:** Begin determining exam date and time (find a time when Thesis Advisory Committee can meet with you; see Chemistry Main Office to reserve a conference room for three hours)

\* **At least 3 weeks prior to exam:** Notify the Graduate Studies Coordinator of the date, time, location of your exam; she/he will arrange for the necessary paperwork to be submitted to the Dean of Research and Graduate Studies.

\* **At least 1 week prior to exam or by June 15 if the exam will take place more than a week after this date:** Submit written proposal to committee members and to the department graduate studies coordinator. Include a cover page giving the date, time, and location of the exam.

\* The oral qualifying examination must be completed by **July 31** of the student's second year in the program to be considered for Departmental and/or University fellowships. The exam is based on, but not limited to, a proposal describing the research to be done as the student's PhD thesis dissertation. A typical length is 10-15 pages, 12 point, 1.5 spacing. The proposal outlines the goals of the research, important background (including key references), preliminary results (progress to date, including acknowledged repetitions of literature procedures), key experiments to be done (plans), directions over the next 2-3

years, and anticipated impact of the research. Detailed guidelines are available from the Graduate Studies Coordinator, and prior discussions with the Thesis Advisory Committee are also useful. This material is briefly presented by the student during the Oral Qualifying Exam, leaving adequate time for thorough discussion of concepts, results, and plans. The amount of research accomplished at this stage depends on the problem, and it is recognized that publishable results may not yet be available; nonetheless, a student will not pass the exam without clear evidence of a substantial research effort, and an understanding of their project in the context of the chemical literature.

The student's committee marks the proposal to give the student helpful suggestions, and also fills out forms that rate several categories on a 0-4 scale. These ratings are aggregated and returned to the student for helping him to determine areas that he should work on. The advisor also submits a written summary of the committee's discussion to the student and to the GSC.

Students who fail the oral exam may retake the exam if the examining committee deems this appropriate. The second qualifying examination, if permitted, may be taken after a period of six calendar months. Otherwise, the student is placed into the Master's degree program, with their appointment to expire at the end of the second year.

#### 4. Appeal for Admission to PhD Candidacy

Any student who has not successfully completed the written qualifying examination (four points on the cumulative examinations, including the additional attempts) can appeal to the GSC for admission to PhD candidacy with the approval of his/her research director. This appeal must be based on research achievement, which is clearly and fully developed in a Master's thesis. This document is submitted to two faculty members in the student's area of specialization, not including the research adviser. If the document is deemed of sufficient quality, a special Oral Qualifying Examination is held to determine if the student will be admitted to PhD candidacy. The committee for this special examination includes the originally constituted committee of research adviser and two faculty members plus two additional faculty members from the student's area of specialization.

### **F. Third-Year Seminar Presentation**

As a part of training students to present research to an audience, the Chemistry Department requires that each student gives a departmental seminar during his third year of study. The topic of this seminar depends on the student's research emphasis and may be on the student's research (physical and inorganic) or on a literature topic (organic).

It is important that the talk contains substantial critical analysis of data. Overviews of a topic, lists of results, and compilations are not sufficient for an acceptable seminar. Students are strongly encouraged to pick a topic specific enough to enable them to dig deeply into the topic, and present their own interpretation of research and literature results, along with detailed scholarly analysis. Dialogue with the research directory and the student's Thesis Advisory Committee is useful in the effort to identify an appropriate topic and analyze it thoroughly.

An important facet of the seminar is feedback that enables the student to hone their presentation abilities. This may take the form of written feedback, verbal feedback, or both. If the student wants verbal feedback, the faculty members present stay for a few minutes and offer constructive comments on the seminar. If the student wants written feedback, they can pick up feedback sheets from the Graduate Studies Coordinator to

hand out to faculty before the seminar. This feedback is informal, and is not retained in the student's official record.

Scheduling the third-year seminar is done by division (inorganic, physical, and organic/biological) at least one month in advance. Students should speak to Marguerite Weston (HH 450) for assistance in finding a time and room. It is beneficial to schedule a time when the members of the Thesis Advisory Committee can attend.

### **G. Fourth Year Review**

During the fourth year of the graduate student's residence in the PhD program, the student meets with his/her PhD examination committee to discuss progress leading to successful completion of a dissertation. The purpose of this meeting is to promote timely completion of the PhD degree. This meeting is informational rather than a second oral examination, and has no formal presentation. The discussion is based on a short written document (in the style of paper abstracts) that summarizes research accomplishments to date, outlines the additional work required to complete the dissertation research, and specifies a tentative timetable for completing that work. The Thesis Advisory Committee fills out a form verifying that these targets are clear. To make sure that these forms are available to the committee, students should inform the Graduate Studies Coordinator of the time and date prior to the Fourth Year Review.

The Fourth Year Review is also an excellent time to discuss career directions with the Thesis Advisory Committee. As career development, students are encouraged to formulate a sample research proposal for informal feedback from the committee. The fourth year review must be completed by July 31 of the student's fourth year in the program to be considered for departmental fellowships. Any student who believes he/she is within six months of completing the PhD thesis may petition the GSC for exemption from this requirement.

### **H. Annual Graduate Student Activity Report and Annual Review**

In association with the benchmark activities described in Sections E–F, all graduate students are required to complete the department's Annual Graduate Student Activity Report. The report must be completed and submitted to the Graduate Studies Coordinator by June 15<sup>th</sup> each year. Students that fail to submit the report by this date will not be eligible for Chemistry Department fellowships or travel grant awards in the subsequent year.

There are special instructions for the completion of this form for **first** and **second year** students:

1. **First year students** only require the signature of their research advisor since their committee will not have been chosen by the time this report is filed.
2. **Second year students** are also required to complete a written proposal ahead of the oral examination as described in Section E.3. The information in the second year proposal overlaps with the information requested in the Research Accomplishments and Research Goals sections of the Annual Graduate Student Activity Report. As such, second year students may simply write, "See Second Year Proposal" in these sections of the Annual Graduate Student Activity Report. The second year report should be attached to the Annual Graduate Student Activity Report.

Along with submission of the Annual Graduate Student Activity Report, all graduate students in the Department of Chemistry will also schedule an Annual Review Meeting. The date of this Annual Review Meeting will be included on the last page of the Annual Graduate Student Activity Report. The Annual Review Meeting must take place before **August 31** each year. For first year students, the Annual Review Meeting will be a one-on-one meeting and progress assessment with the faculty research advisor. For second year students, the Annual Review Meeting will be the Oral Qualifying Exam (Section E.3). For third year students, the Annual Review Meeting should be scheduled in association with the Third Year Seminar presentation (Section F) and should include all Thesis Advisory Committee members. This meeting could take place immediately after the Third Year Seminar Presentation, but if this is not possible, it should be scheduled shortly thereafter. For fourth year students and beyond the Annual Review Meeting will be scheduled with all members of the Thesis Advisory Committee and should take place annually before August 31.

The format of the Annual Review Meeting for fourth year students and beyond is flexible. The Annual Review Meeting for fourth year students should not take longer than one hour. The Annual Graduate Student Activity Report will be the basis for discussion, but a student's research advisor may also request that a student prepare a short research progress presentation as well. Students should discuss the format of the meeting with their research advisor. The purpose of the Annual Review Meeting is to review progress with the Thesis Advisory Committee and to establish goals and modifications to the research project that will ensure timely progression to completion.

## **I. Thesis and Final Oral Examination**

After the student has completed his/her PhD research to the satisfaction of his/her research director, he/she submits and defends a doctoral thesis. Information outlining the necessary steps to preparing a PhD defense, as well as a thesis manual, can be found online at [www.rochester.edu/college/gradstudies/phd-defense/](http://www.rochester.edu/college/gradstudies/phd-defense/). Also available online is the graduate academic calendar which can be found at [www.rochester.edu/college/gradstudies/events/](http://www.rochester.edu/college/gradstudies/events/). This calendar can be helpful to the students when planning for specific conferral and registration deadlines.

Approximately three months prior to defending his/her thesis, the student should consult with the Graduate Studies Coordinator regarding the procedure for registering his/her thesis for the final exam. Since thesis registration is an online process, the Graduate Studies Coordinator can assist with the process of uploading the thesis, as well as the distribution of the thesis to all committee members. Once the thesis has been uploaded and copies have been distributed, no changes can be made until after the final oral examination. Note that all members of the thesis committee must sign off on approval of the thesis 3 weeks before the actual exam date, so that completion of the thesis must be well ahead of the planned date for the exam.

The student's final defense committee is normally the Thesis Advisory Committee (who served on the student's oral qualifying exam committee) and the addition of an outside member and a chair. It is the student's responsibility to identify the outside member and chair, as well as coordinate with these individuals as they proceed through the process of registering their thesis defense. The "outside member" is usually a faculty member from another department within the university, but may also be from industry or another university. If this person is not a full-time UR faculty member, then the student must submit a request, with the proposed committee member's curriculum vitae attached, to

the Dean of Graduate Studies requesting permission for that person to serve on their committee. Permission must be obtained at least two weeks before the thesis can be registered. The “chair” presides over the examination committee and must be a UR faculty member. This individual will not have a vote in the proceedings and is not required to read the thesis, but will serve as a moderator.

The final defense consists of a departmental seminar followed by a question and answer period. The candidate and committee then meet in private for the final oral examination. The committee usually requires some revisions before the PhD thesis is finalized, and the PhD candidate should allow for some time to complete these revisions after the thesis defense. Following successful completion of the final oral examination and revisions, a final corrected copy of the thesis is uploaded to the PhD registration site. The PhD candidate has successfully completed the PhD Program only after this final corrected copy is received and accepted by the Graduate Dean’s office. If significant changes are recommended, signatures may be required from the research director and/or other members of the committee indicating that the corrections are satisfactory. Be aware that many jobs and postdoctoral positions will not allow you to begin until you have proof that you have completed your PhD!

Also included with the final upload of the corrected thesis, the student will be asked to make decisions on public access to their thesis. All theses are eventually publically accessible, but in order to finish publishing papers and patenting discoveries, it is common to request an embargo period (1-2 years) before releasing the thesis to the public. This may be a sensitive issue for some research, so it is best for students to discuss access and publishing plans with their research director prior to submission, especially if patentable results have been obtained.

## **J. MD/PhD Program**

The Department of Chemistry also offers a PhD program for students who have been admitted to the MD/PhD program at the University’s Medical School. The teaching requirement can be fulfilled with two units of teaching. The course work requirement consists of three courses to be approved by the Graduate Studies Committee, based upon the interests and background of the student, and a course in Ethics in Research. All other qualifying and final examination requirements are the same as for other PhD students.

## **K. Professional Conduct**

Graduate students in the Chemistry Department of the University of Rochester have an obligation to uphold the highest standards of scholarship, scientific investigation, and personal and professional integrity. Violations of appropriate standards of professional conduct are reviewed by the Graduate Studies Committee, the Chemistry Department Chair, the University Committee on Academic Policy, or other University offices as set forth by *Regulations and University Policies Concerning Graduate Studies*, and can result in penalties up to expulsion from the program. Details of the University Academic Honesty Policy can be found at <http://www.rochester.edu/college/honesty/graduates.html>.

## **L. Fellowships**

### **1. Departmental Fellowships**

The Chemistry Department offers \$3,000 fellowship awards to students who demonstrate excellence in their graduate work. As a student progresses through the PhD program, the criteria for fellowship selection change, depending on the specific goals of that phase of the program (see below). The title of the fellowship must correspond to the source of the funds used to support the award, and so there may be variation in the names of the fellowships given below. Fellowship awards are distributed over the course of one academic year (September to August), and no preference is given to current fellowship holders in the selection for subsequent fellowships.

Fellowship decisions are made by the Graduate Studies Committee each summer, determining fellowships for the upcoming year. No formal application is necessary for the Sherman Clarke (Second Year) and Ewart (Third Year) Fellowships. There is a departmental announcement giving the due date for applications for fellowships for advanced students. Fellowship recipients are notified in August.

#### *Sherman Clarke Fellowships (Second Year)*

Criteria: Excellent grades (typically 3.7 GPA); good performance in teaching; progress in research. The Graduate Studies Committee requests letters of recommendation from the research directors of students with grades high enough for consideration.

#### *Ewart Fellowships (Third Year)*

Criteria: Good grades and teaching; excellent performance on oral Qualifying Exam. The Graduate Studies Committee gets feedback from the Qualifying exam, including a letter from a member of the oral exam committee and from the Research Director.

#### *DeRight, Weissberger, and Lattimore Fellowships (Fourth and Fifth Years)*

Criteria: Excellence and volume of research, usually demonstrated through publications and/or national presentations. Students submit a CV, two letters of recommendation from faculty members, and a 3-page statement of research accomplishments. The statement must use Arial or Times font, >11 point, with 1-inch margins, and is limited to three pages.

The DeRight, Weissberger, and Lattimore fellowships provide \$500 in travel funds to present research results at a conference.

## 2. University Fellowships

The University awards additional fellowships, named after Elon Huntington Hooker and Agnes and George Messersmith, each academic year to graduate students in the natural sciences. The Chemistry Department historically has been allowed to nominate five students for the Hooker Fellowships, and one student for the Messersmith Fellowships. In order to choose these departmental nominees, students are asked to submit applications in March or April, which are considered by an *ad hoc* committee (the research directors of nominated students are not present) who select the students who are most likely to be competitive at the University level. The application materials are identical to those for the DeRight/Weissberger/Lattimore Fellowships. Students who are awarded University fellowships receive a \$5,000 fellowship award on top of their stipend, and the remainder is applied toward the student's stipend.

## 3. GAANN

In 2006, the Department of Education chose Rochester as a site for developing Graduate Assistance in Areas of National Need (GAANN) through a grant. The Department of Education mandates that supported students must demonstrate financial need (through completing a FAFSA form annually) and must be a U.S. citizen. According to the terms of the grant, selection of students is based on supporting the goals of the GAANN program, and includes special consideration of students in areas of national need (underrepresented groups and women). Being chosen for a GAANN fellowship does not change the student's stipend, and neither requires nor implies a departmental fellowship award (section L.1). Rather, GAANN fellowships are used to fund part of the student's stipend or departmental fellowship. This enables our department to support more graduate students, especially in areas of national need. More details are given at <http://www.chem.rochester.edu/graduate/gaann.html>

#### 4. Outside Fellowships

There are a number of external sources of funding support that are specifically designed to support students. Examples of these prestigious fellowships include the Sigal ACS Fellowships, NSF Graduate Fellowships, Hertz Fellowships, NIH F31 Fellowships, and ACS Organic Division Fellowships. Students are strongly encouraged to apply for these fellowships if they and their research director feel that it is warranted. These fellowships typically specify the stipend that the student is to receive, and the department must follow the fellowship sponsor's policy. In the event that the award is less than the current departmental stipend level, the award will be supplemented as allowed to bring the student's stipend to the level provided by the department.