



# Degree Requirements for the Graduate Program in Chemistry and Biochemistry 2025-26

**Periodic Table of the Elements**

A standard periodic table of elements, color-coded by groups. It includes element symbols, atomic numbers, and names. The table is organized into rows (periods) and columns (groups). The lanthanide and actinide series are shown as separate rows at the bottom.

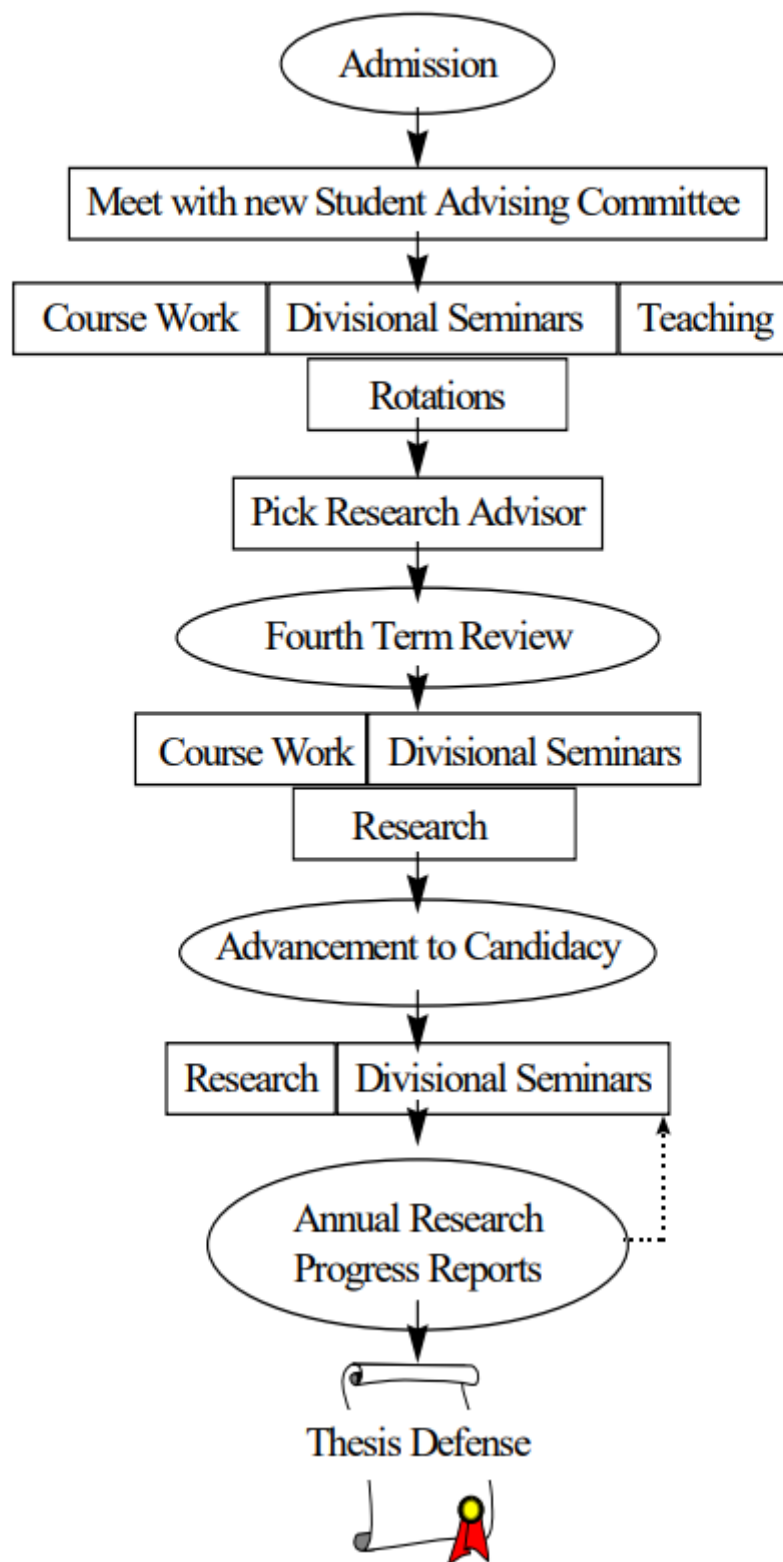
This manual is an overview of required departmental milestones for both the Ph.D. and the Master's degree programs. Students should consult the University of Graduate Studies Website for further information on the policies and regulations of the University and Graduate School.

*Rev 7-2025*

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# Ph.D. Degree Flow Chart



## Required Milestones for the PhD Program in Chemistry and Biochemistry.

The Graduate School and the Department of Chemistry and Biochemistry require that students complete Required Milestones in a timely manner in order to make satisfactory academic progress, in addition to maintaining a sufficient GPA and satisfying other departmental requirements. Failure to make satisfactory academic progress may result in the student being placed Academic Probation or no longer being guaranteed support from the Department. The table below summarizes these Required Milestones and the expected term by the end of which they will be completed. Not completing the Required Milestones by the term listed may result in a finding of insufficient academic progress by the student's Dissertation Advisory Committee (for PhD students beyond their first year) or ad hoc academic committee (for first-year PhD students). In exceptional cases, the student's committee may grant an extension for one or more of these Required Milestones.

**Table of Required Milestones for Chemistry and Biochemistry PhD Program**

Division	Required Milestone	Expected Term of Completion
All	Identify and join a research group	End of Spring term of 1 <sup>st</sup> year
Biochemistry	Advance to Candidacy	Late Fall or early Winter of 2 <sup>nd</sup> year
Organic/Inorganic/Materials Chemistry	Pass Advancement to Candidacy examination	Spring of 2 <sup>nd</sup> year
Physical Chemistry	Pass Advancement to Candidacy examination	Winter of 2 <sup>nd</sup> year
All	Maintain overall 3.00 GPA	Every term

### I. Basic Academic Requirements

Ph.D. degree requirements for all Chemistry and Biochemistry students include an Advancement to Candidacy Exam. Specific Divisional requirements are given below. These apply to all PhD students entering Fall 2020.

Upon admission, beginning students will be asked which Divisional program (Biochemistry, Organic/Inorganic/Materials, or Physical Chemistry) they wish to follow. At any time during their course of study, students may transfer from one program to another by simply making up any deficient requirements for the specific program to which the transfer is being made. While the official thesis

advisor must be a tenure-related member of the Department, the thesis research may be carried out with a faculty member from another science department and/or institute, assuming that satisfactory arrangements can be made with the individuals concerned. Such interdisciplinary research programs are strongly encouraged.

At least 18 credit hours are required in Dissertation (CH 603) for the Ph.D. degree. Credit for Research and Thesis is recorded on a P/NP basis. During the term the thesis is defended, the student must be registered for at least 3 hours of CH 603. Graduate students must maintain a cumulative grade point average of 3.00 in all graduate courses taken during the degree program. Students must be registered for at least 3 credit hours during the term in which they are advanced to candidacy.

Degree requirements are reviewed each year in January. Degree requirements for students entering in the following year can be changed by approval of the relevant division following discussion at a Department faculty meeting. The faculty and graduate students are to be notified of any changes to division requirements. Students may choose to follow the requirements associated with the year they entered the PhD program or those in place at the time of their advancement to candidacy exam. Under extraordinary circumstances, department-level requirements may be waived upon approval of the Department Head, Director of Graduate Studies, and the student's thesis committee. Waiver of University-level requirements requires petitioning the Graduate School.

## **Biochemistry Division**

### **Advancement to Candidacy**

Requirements:

- Satisfactory completion (grade of 'B-' or better) of the Advanced Genetics, Advanced Biochemistry and Scientific Reasoning courses
- Satisfactory dissertation project development and research progress as assessed by the student's thesis committee

Guidelines:

First year students typically take Advanced Genetics in the fall term and Advanced Biochemistry in the Winter term. The Scientific Reasoning course is taken in the second year fall term. The first meeting with the thesis committee occurs in late fall or early winter term also in the second year. The committee approves

advancement based on an evaluation of the student's progress developing their project and in their research. The student and advisor provide input to the committee (see section "Review of Progress & Additional Requirements") after completion of the proposal-writing segment of the "Scientific Reasoning" course. The precise timing of the meeting - i.e. whether it occurs at the end of the fall term or in the winter term - is at the discretion of the student and their advisor. Advancement can be deferred until another thesis committee meeting if the committee or advisor deems that additional project development or research progress is needed.

### **Course requirements**

Students must register for a minimum of nine (9) graduate hours per term up to sixteen (16) maximum while maintaining a GPA of 3.00 or greater. A student's advising committee may recommend or require additional courses be taken before graduation.

## **Organic/Inorganic/Materials Division**

**Course Requirements:** Students must register for a minimum of nine (9) graduate hours per term up to sixteen (16), maximum. The programs of first-year students will be worked out in consultation with faculty members at the time of entering the graduate program. The student, following discussions of degree and research objectives with the research supervisor, should select subsequent coursework. A student's advising committee may recommend or require specific courses to be included.

First-year students typically take two graduate level Chemistry courses plus additional hours to meet the minimum of nine (9) credit hours each term. In addition, students must complete at least six (6) graded graduate courses (3 or 4 credits each) at the 500 or 600 level. At least four courses must be in Chemistry; two may be in an obviously related field.

Reading and Independent Study Courses (e.g. CH 605) may qualify as one or more of the required six courses with approval by the student's committee, and if the courses are taken for a grade at a load of at least 4 credits.

**Advancement to Candidacy:** Organic/Inorganic/Materials students typically undergo this examination during the sixth (6) regular term of their graduate career (excluding summers).

The purpose of the Advancement to Candidacy exam is to assess the student's general understanding of Chemistry and the scientific method, and the student's

ability to successfully carry out research at the doctoral level. These criteria are evaluated in the context of the student's presentation of one original research proposal and a research report/proposal. The original research proposal demonstrates the student's ability to develop research ideas outside of their immediate thesis area and to defend those ideas. The research report/proposal allows an evaluation of the student's research to date, the student's ability to place their research in the context of the field and the student's understanding of the future direction of the research that will ultimately constitute the basis of his/her thesis.

To advance to candidacy in the Organic/Inorganic/Materials division, a student must:

1. Have taken six graded graduate courses with at least a 3.00 GPA,
2. Prepare an original research proposal and a research report (details below), and
3. Orally defend the original research proposal and research report in an Advancement to Candidacy Exam.

The **original research proposal** is a written document that describes: (1) an interesting original research problem, and (2) how the student proposes to investigate the problem. The purpose is to demonstrate ability to select significant research questions and to suggest reasonable scientific approaches for solving the problems. Generally, it is appropriate to include an introduction, background, proposed research, and significance sections as well as a bibliography. Typical proposals are ~6 pages, single-spaced, including figures but excluding references. The ideas in the proposal must be the student's own. Therefore, it is not permissible to ask for or to receive help from any faculty member. Short discussions with a faculty member relating to the appropriateness of the topic are permitted, as are brief discussions about whether the topic is in-field or out-of-field. In fact, students should consult with several committee members about the general suitability of the topic while the proposal is still in the formative stage (i.e. before committing significant time to the topic). At least four weeks in advance of the exam date, a student should submit a written abstract of the proposed topic to their committee chair. While it is not appropriate to discuss the proposal in any substantial detail with faculty, students are encouraged to talk to other students to get their opinions of the proposed ideas. Likewise, students are encouraged to have other students read and critique the proposals.

The **research report/proposal** summarizes in detail a student's research accomplishments while working in the mentor's research group, and future directions and possible extensions of this research area. The purpose is to assess both the student's depth of knowledge in the field and research progress. Since students are expected to have worked closely with their advisor on the research work accomplished and future directions of the work, students are encouraged to discuss the content of the research report/proposal with their mentor and other faculty. Manuscripts submitted or in preparation can be submitted in lieu of a formal research report if authorized in advance by the committee. A brief document (2-3 pages) outlining future directions should be included with the manuscript. In the absence of a manuscript, the research report is typically 5-6 pages.

The Advancement to Candidacy **oral defense** will test the student's ability to think independently and to demonstrate specific, as well as general, chemical knowledge. In both the written and oral presentations, the student should stress the question(s) to be examined and indicate clearly how a successful completion of the proposed research would answer the questions posed. Students are advised to prepare a 15-20 minute talk on each proposal (i.e. the original research proposal and the research report/proposal). Numerous questions from the committee will lengthen the presentation beyond the twenty minutes of prepared time. Generally, two hours are required for a discussion of both proposals.

## Physical Chemistry Division

Note: Students seeking to advance to candidacy under Physical Chemistry ground rules must have taken at least three Physical Chemistry graduate courses. In cases when divisional affiliation is uncertain, the appropriateness of a student pursuing the advancement to candidacy exam under Physical Chemistry rules will be taken under consideration by the Physical Chemistry Division.

**Advancement to candidacy** in the Physical Chemistry division has two components.

1. Satisfactory research progress: The Student's thesis committee will evaluate research progress during a fourth term review (see "Review of Progress and Additional Requirements" below), receiving input from both the advisor and the student. Additional thesis committee meetings can be called if the thesis committee or advisor deems it necessary.



2. **Advancement to Candidacy Examination:** The exam is typically taken in Winter term of a student's second year and not later than Spring term. The purpose is to assess the student's general understanding of Physical Chemistry and the student's ability to successfully carry out research at the doctoral level. These criteria are evaluated in the context of the student's presentation of a research proposal. The proposal and the examination should demonstrate that the student has a sufficient understanding of the relevance of their research project in the larger context of the related current research. The student needs to have a vision of the novel scientific directions in which the project could develop in the course of the thesis, as well as of the possible long-term scientific implications of the research performed. A short written proposal (at least 6 pages) describing the student's planned research will be due one week before the examination. More emphasis will be placed on the quality of the proposal's contents than on its length or precise format. Students are strongly encouraged to contact their committee chair about the proposal and the format of the oral exam well in advance of the examination.

**Research presentation:** In the third year the student is required to present a short talk on their research as a divisional or departmental seminar or as a (contributed) talk at a national or regional conference. The talk will substitute for the student's Annual Review of Academic Progress.

**Course Requirements:** Students must register for a minimum of nine (9) graduate hours per term up to sixteen (16), maximum. The programs of first-year students will be worked out in consultation with faculty members at the time of entering the graduate program. The subsequent program of coursework should be selected by the student following discussions of degree and research objectives with the research supervisor. A student's advising committee may recommend or require specific courses to be included.

First-year students typically take two graduate level Chemistry courses plus additional hours to meet the minimum of (9) nine required per term. In addition, students must complete at least six (6) graded graduate courses (3 or 4 credits each) at the 500 or 600 level. At least four courses must be in Chemistry; two may be in an obviously related field.

Reading and Independent Study Courses (e.g. CH 605) may qualify as one or more of the required six courses with approval by the student's committee, and if the courses are taken for a grade at a load of at least 4 credits.

## **II. Other Requirements**

### **Journal Clubs and Seminars**

#### Biochemistry Division

1. All Biochemistry graduate students are expected to sign up for, attend, and participate in the Institute of Molecular Biology (IMB) Student Research Seminar Series. Beginning in the third year, students will be asked to present a seminar on their ongoing thesis research once a year. This provides an opportunity to present research results to a general audience.
2. To improve general seminar and lecture presentation skills, all Biochemistry graduate students are expected to sign up for, attend, and participate in the IMB Journal Club Series. Beginning in their second year, graduate students will be called upon to present a journal club seminar at least once a year.
3. All Biochemistry graduate students are expected to sign up for and attend the weekly IMB Seminar Series, which features research seminars presented by invited speakers from other universities. These seminars provide students with exposure to forefront research covering a wide range of topic areas from experts in their discipline.

#### Organic/Inorganic/Materials Division

1. Students in the O/I/M Division are expected to register for CH 623 in the Fall term of their first year. This course helps students develop skills associated with effective scientific presentations along with other professional skills that are important for success in graduate school and beyond. Students may register for CH 623 in later years as well. Students are also required to give a departmental seminar on their thesis research in the Winter term of the third year.
2. All O/I/M students are expected to register for and attend CH 607, "Organic/Inorganic/Materials Seminar."

#### Physical Chemistry Division

1. Enrollment in the P-Chem journal club is required for all Physical Chemistry students in their first two years, but is optional for more advanced students. First year students will give 10-15 minute talks to faculty and graduate students in the division at the end of each term-long research rotation.

2. All P-Chem students are expected to register for and attend CH 607, "Physical Chemistry Seminar."

## Teaching

Candidates for an advanced degree are required to participate in the undergraduate teaching program in Chemistry for a period of three terms sometime during their graduate career. This typically occurs during the first year of study. Non-English-speaking students are required to take the SPEAK test and to score 50 or higher before they may teach.

## Research

The Ph.D. program prepares a candidate for independent scientific research. Such preparation requires active experience with the research process.

### Rotations

All graduate students are required to rotate through three different laboratories during the Fall, Winter, and Spring terms of their first year. Research rotations give students an opportunity to work in three different environments that both broadens the educational experience and provides a strong basis for the selection of a thesis advisor. Students are expected to discuss possible rotations with faculty before the beginning of each term.

At the end of each rotation period, students will present a 10-15 minute talk on the results of their research project to faculty and students.

If a student does not find a research group to join after three rotations, an ad hoc committee will be formed to advise the student and review their academic progress, including their research progress. If the student is making satisfactory academic progress (other than not having joined a research group after their third rotation), the student will be able to complete a fourth rotation arranged collectively by the Department Head, ad hoc committee, and student. If a student does not find a research group to join after their fourth rotation, the ad hoc committee will meet with the student to assess their academic progress. Not finding a research group to join after a fourth rotation is a strong indication that a student is not making satisfactory academic progress, but any such determination will be made by the ad hoc committee.

### Doctoral Research

The ultimate, and by far the most important, requirement for the Ph.D. degree is for a student to pursue a research problem to a point culminating in a written thesis that makes a significant and original contribution to the understanding of some aspect of Chemistry. The student will submit the written thesis to the advisory committee for review. The candidate must then defend the thesis before the committee and be prepared to answer questions about the thesis and related subjects.

7-year limit. Graduate School regulations stipulate that the residency requirement, advancement to candidacy, and the doctoral dissertation must be completed within a seven-year period from the initial date of enrolling, unless an "on-leave" status has been approved.

## **Review of Progress & Additional Requirements**

### Prior to Joining a Research Group

A student's progress in the first year will be assessed by quarterly rotation reports, which are submitted by the student's rotation supervisor; course grades; and teaching evaluations. These are reviewed by the Department Head. Should a minor problem arise, the Department Head will meet with the student to assess the situation and offer advice. For more substantial issues, the Department Head will assemble a review committee of faculty to consult/ advise the student and to make appropriate recommendations to the Department Head.

### Fourth-Term Review

During the fourth term of residence (usually the Fall term of the second year), graduate students are required to meet with their assigned thesis advisory committees. The purpose is to assess the student's early progress toward the Ph.D. degree. The fourth-term review has three parts:

1. To review course requirements and progress
2. To review and discuss the student's ideas and progress towards a thesis

This review is not a pass/fail situation, but should be viewed as an opportunity to get better acquainted with your thesis committee and to discuss your research ideas and goals with them.

A. Report: students must write a 3-5 page report summarizing ideas and plans for the thesis. Included in this report should be specific plans for what the student will do first (and why), what the student will do second (and why), etc. This report should be presented to the committee one week before the scheduled review.

B. Talk: students should also prepare a ten-minute talk describing the proposed work. This talk will be a framework for the discussion at the review.

All members of the committee should be invited to the meeting, but the outside member is not required to attend. Immediately following the review, students will be given an oral evaluation of their performance to date. In addition, a brief report summarizing the meeting and the committee's assessment of the student's progress will be forwarded for placement in the student's file. A copy of the report will be sent to the student. The Department will notify the students when it is time to schedule the exam.

#### Annual Review of Academic Progress

Each year following advancement to candidacy, students are required to meet with their thesis advisory committee during Winter or Spring term. For third year students, the annual review can coincide with 3rd-year research presentations. The Department will notify students when it is time to schedule the review. Students should contact all members of their committee and try to accommodate their schedules in arranging a meeting. It is not necessary for all members to attend each year, but a minimal group consisting of the student's thesis advisor, the committee chair, and one other member must be present.

A. Report: Students are expected to write a brief report, usually 3–5 pages, summarizing research progress and plans for the coming year. Students are also encouraged to list other academic activities since the last Annual Review, such as courses taken for a grade, seminars presented and scientific meetings attended, at the beginning of the report.

B. Talk: Students should be prepared to give a short talk (10 minutes) on their work, including a brief introduction, suitable for committee members who are not specialists in the immediate area of research.

Immediately following the review, students will be given an oral evaluation of their progress. In addition, a brief summary of the meeting and the committee's assessment of the student's progress will be forwarded to the Department for placement in the student's file. A copy of the report will be sent to the student. An

annual review summary is required to be on record in each academic year in order for the student to be making satisfactory progress.

## **Guidelines for dismissing a graduate student**

### 1. Separation from a Research Group

This category applies to cases in which separation of a student from a research group, but not dismissal from the graduate program, is considered. In these cases, it is assumed that the student has complied (and continues to comply) with all Department and University requirements and that the student is making satisfactory progress toward the Ph.D.

#### a. Separation Prior to Advancement to Candidacy

At any time before Advancement, a student may be asked to leave a research group by the professor in charge. The student's committee should be informed of the impending action before the student himself is informed. A meeting may be held at the request of the student, the advisor, or any member of the committee to clarify the situation, but no formal vote of the committee is required. The student will be expected to work as a teaching assistant to support themselves during this time.

#### b. Separation after Advancement to Candidacy

Students who have been advanced to candidacy, who comply with Department and University requirements, and who are making satisfactory research progress cannot be separated involuntarily from a research group. The student's committee must meet to arbitrate an agreeable solution to the conflict. In general, failure to follow proper safety protocols and repeated violations of safety procedures during research can result in dismissal from the program.

### 2. Dismissal from the Chemistry Program

This category applies to those students who have failed to meet Department or University requirements and to those students who are not making satisfactory progress toward the Ph.D.

#### a. Dismissal Prior to Advancement to Candidacy

In this case, the student's committee must meet. The committee has the authority to immediately terminate the student's enrollment in the graduate program, or it can warn the student by establishing the conditions under which the student may continue in the program. (The latter course of action is preferred.) If the student fails to comply with the conditions set forth by the

committee, a second committee meeting with the student should be called to determine whether the student should be dismissed from the program.

The full faculty must be informed at a faculty meeting before the dismissal is official. The full faculty may direct the committee to reconsider the dismissal recommendation, but no formal vote of the faculty is required for dismissal. Any dismissal from the program should follow American Chemical Society guidelines with regard to financial support, which is typically one additional term on a Department-supported TA-ship.

b. Dismissal at the Advancement to Candidacy Exam

Three outcomes are possible at the Advancement to Candidacy Exam. Students can pass unconditionally; they can be asked to rewrite selected parts of proposals or to fulfill certain other obligations; or they can fail. Outright failure with subsequent dismissal from the program becomes official only after the full faculty is informed at a faculty meeting. Students for whom the decision is postponed and who fail to do the agreed-upon requirements can be dismissed at a subsequent committee meeting. As always, the dismissal becomes official only after the faculty is informed of the decision at a faculty meeting. In all cases, American Chemical Society guidelines should be followed with regard to financial support, which is typically one additional term on a Department-supported TA-ship.

c. Dismissal after Advancement to Candidacy

The student's committee must meet with the student to establish the conditions under which the student may continue in the program. A second meeting should be scheduled to review the student's compliance with the conditions set forth by the committee. Failure to comply can result in a recommendation for dismissal, as determined by the committee. The dismissal becomes official only after the faculty is informed of the decision at a faculty meeting. In all cases, American Chemical Society guidelines should be followed with regard to financial support, which is typically one additional term on a Department-supported TA-ship.

d. Dismissal with a Ph.D.

This category applies to students who have been told by their research advisors to finish their research and write a Ph.D. thesis by a certain date. Typically, the deadline is accompanied by notification that financial support will be terminated should time beyond the deadline be required. The student's committee must be notified if a research advisor plans to set a deadline for receipt of a Ph.D. thesis. At a meeting with the advisor and the student both present, the committee should work to set a realistic date for receipt of the thesis. The student must be notified

in writing of the date set by the committee. The committee must meet a second time to review the student's progress and to approve the termination of financial support.

### **III. Transitional Masters Internship to Ph.D. Program**

Students transitioning from the University of Oregon industrial master's internship program to the Ph.D. program are expected to follow the guidelines indicated above for the traditional Ph.D. program with the following differences.

#### **Rotations**

Students are encouraged to do at least two rotations through faculty laboratories before joining a research group; however, students may petition to join a lab after only one rotation. Students are expected to contact a prospective rotation advisor prior to transitioning to the PhD program. During rotations, students will be supported either by research stipends from a faculty member's grants or as Departmental GEs, depending on availability of TA positions during this period. The method of student rotation support will be determined by the prospective rotation advisor. Support through a TA position must be confirmed with the Department Head.

#### **Fourth-term Review and Advancement to Candidacy**

After officially joining a research group, students are expected to complete a "4th term" review after six months and to complete their advancement to candidacy exams within 12 months. The 6 and 12-month durations are similar to the traditional Ph.D. student guidelines for the 4th term and advancement to candidacy reviews. The review dates, however, are not tied to the traditional academic calendar to accommodate different start dates by students returning from their internships.

#### **Teaching**

Graduate students returning from industrial internships would typically complete their teaching requirements by serving as GEs in the summer master's immersion courses, teaching at least one quarter during their graduate careers. It is anticipated that most students will teach the equivalent of at least three quarters via a combination of summer course and/or unfilled Department GE positions.

#### **Coursework**

Coursework completed as part of the industrial master's program will count toward the Ph.D. coursework requirement described above. The students'



research advisor may recommend additional coursework. Students are expected to participate in the divisional seminar series and journal clubs. Students are also expected to meet requirements for any departmental seminars in their division (e.g. the O/I/M 3rd year research talk), but the specific timing of these talks may vary from student to student due to variations in start date. Students should discuss with their research advisor when to schedule these talks.

## **IV. Master's Degree Requirements**

The preceding material has been prepared with the expectation that most entering graduate students plan to attain a Ph.D. degree in Chemistry. Students who have been admitted to candidacy for the Ph.D. degree without a master's degree do not automatically receive a master's degree; however, they are encouraged to petition to receive an M.S. degree when they have completed the requirements for a master's degree. Following is a summary of Departmental and Graduate School requirements for a master's degree. Students are advised to consult the Graduate School for a complete description of University requirements.

### **Course Requirements**

All work applied toward a master's degree must be completed within (7) seven years, including transferred credits. Students must complete no fewer than 45 credits in courses approved for graduate credit with a grade point average of 3.00 or better in all graded courses. Of this work, 30 hours must be in the Department, 24 must be taken as graded credits, and nine hours must be in courses numbered 600-699.