

Graduate Program in Chemistry: Policies, Requirements & Guidelines

1.0 Introduction

This document describes the requirements for the graduate programs in chemistry and other related Chemistry Department policies. These program requirements and policies have been formulated after wide consultation with all interested parties and agreed by vote at duly constituted faculty meetings. These requirements and policies are subject to change from time to time. When such changes occur, a new version of this document will be produced and changes which affect students currently in the program will be notified in writing by the Graduate Program Director (GPD). Written reminders of requirements and policies currently in place will also be issued periodically by the GPD. Relevant information is posted on the notice boards near the Chemistry main office. Students should consult these on a regular basis.

The Chemistry Graduate Program operates within the University's regulations as described in the *Graduate School Bulletin* and the *Graduate Student Handbook*. These publications are issued by the Graduate School and Graduate Dean's Office, respectively, and students are expected to be familiar with the relevant regulations. Some Department regulations are more restrictive than University regulations. When these regulations appear to be in conflict with the regulations of the Graduate School given in the *Bulletin* or the *Handbook*, the regulations of the Graduate School shall take precedence.

At the time of first registration, a member of the Graduate Program Committee (or designated alternate) is assigned as faculty adviser for each student. This assignment continues until the student is assigned a dissertation adviser. Thereafter, the dissertation adviser is the faculty adviser. Should the student change dissertation adviser, the new dissertation adviser becomes the faculty adviser for the student, and a new research program is begun. The Graduate Program Director is also available for consultation concerning any aspect of the program.

1.1 Degrees Offered

The Ph.D. in Chemistry is the only degree program per se that we offer. Students who are unable to complete the Ph.D. program may instead be allowed to earn a terminal M.S. with either a thesis or non-thesis option. The requirements for each degree are different, though it should be noted that the same academic standards are required for satisfactory completion of an M.S. degree as for a Ph.D. degree even though the requirements of the former are not so extensive. Otherwise, there is a limited option of an "M.S. en route to the Ph.D." (non-terminal masters) for doctoral students wanting the M.S. degree.

1.2 General Philosophy of Program

The Chemistry Graduate Program, in common with other graduate programs, is designed to provide students with opportunities to acquire the knowledge and skills needed to embark on careers as independent scientists. Thus there are various features of the program which relate to oral and written communication skills, acquisition of advanced knowledge, laboratory techniques, teaching, research skills, professional working practices and so on. A major feature of the program is the production of a doctoral dissertation that satisfies the university's criteria. The description of these, taken from the University's regulations, encompasses several of the skills described above.

"The dissertation in its completed form will be judged largely upon the ability of the candidate to review and make critical use of the literature; to formulate a problem, plan a method of attack and work systematically towards a solution; to summarize the material or data, and draw conclusions based thereon. Scholastic attainment in writing and presenting the results of the study will be crucial. The goal of the dissertation is to make a contribution to knowledge. It should be of publishable quality."

Many departmental requirements have been devised so that students can demonstrate that they are making satisfactory progress towards the production of a dissertation or thesis that will satisfy these criteria.

1.3 Exceptions to Requirements

When there is good cause, the Graduate Program Director will consider requests for exceptions to the regulations described in this document. Such requests must be made in writing and, where relevant, accompanied by a supporting memo from the student's adviser.

2.0 Progress Towards Completion of Studies: Satisfactory Progress, Termination of Studies

Both the University and the Department take the position that primary responsibility for continued progress to the successful completion of studies lies with the student. All students are expected to advance towards attainment of their degree as rapidly as possible consistent with maintaining excellence in scholarship, and to pursue research-related activities during the January intersession, the Spring break, and during the summer (June, July and August) as well as during the academic semesters. Progress is monitored by the GPD in consultation with the student's adviser and committee.

The General Regulations of the Graduate School stipulate that a student who obtains a GPA of 2.8 or below in any two semesters (consecutive or otherwise) is subject to academic dismissal. The Chemistry Department expects first-year students to achieve at least a 3.0 average as a prerequisite for advancing to the second year of the program.

2.1 Satisfactory Progress *(includes all four components)*

- (a) Achieving minimum grades in required courses and maintaining a 3.0 overall GPA.
- (b) Completion of the various requirements of the program by stipulated deadlines.
- (c) Maintaining continued progress in research.
- (d) Having a research adviser by the end of the first year of the program and thereafter.

2.1 Termination of Studies

Failure to make satisfactory progress may result in transferral from the Ph.D. to M.S. track or to termination of studies. In addition, a student's graduate program may be terminated for reasons of safety (to others or to self), even though satisfactory progress is otherwise evident. Plagiarism and academic dishonesty can be additional reasons for dismissal.

3.0 Financial Support and Conditions of Employment

Students are normally admitted to the Chemistry Graduate Program only if they have financial support as approved by the Department. For most students this support takes the form of an assistantship provided by the Department. Initially such assistantships are teaching assistantships, but later in the program students are typically supported on research assistantships provided by their research adviser's grants. Some students (usually international students) are supported by external sources, such as government scholarships, and some students are supported by assistantships from other campus-based sources outside the Department.

Research assistantships are normally funded by faculty grant support. The selection of appointees, terms of contract, and other details of such appointments fall entirely within the purview of the faculty member who is the principal investigator on the grant, subject to Departmental and University regulations.

Students who have adjunct faculty as advisers are not eligible for departmental teaching assistantships and must be supported by their advisers.

3.1 Duration of Department Support

For students offered the standard funding package, the Department guarantees support over a five-year period (if necessary) as long as the student maintains **satisfactory progress in research, academics, and any teaching duties**. *Students who enter the M.S. track do not have this guarantee of support.*

3.2 Workload: Limitation on Total Hours

Students (especially international, but also U.S.) should note that there are university regulations governing the number of hours a student may work: the number of hours for the assistantship plus the number of credit hours.

- **USA Students:** **40 hours** per week is the maximum for *working hours + course credit-hours*, excluding dissertation or thesis credits. Work includes any type of campus employment: *assistantships*, student hourly, work-study, etc.
- **International Students:** F1 and J1 visa-holders are limited to **20 hours** per week during the regular semester for *working hours + credit-hours*, excluding dissertation or thesis. (Work for internationals includes assistantships and student hourly, but not work-study.) However, during **January break and summer**, the usual **40 hours** per week is permissible.

3.3 Outside Employment

Graduate students appointed as Teaching Assistant or Research Assistant may not, in general, accept concurrent employment elsewhere. Any exceptions to this outside-employment restriction must be approved both by the GPD and the dissertation adviser prior to acceptance of any outside employment. Note: Graduate students should not provide paid tutoring services for any student for whom they have responsibility for grading.

3.4 Contract Period

Since department support is usually year-round, the contracted employment period therefore includes the January intersession (break between fall and spring semesters), spring-break week, and summer. Teaching Assistants or Research Assistants are governed by the GEO contract, which is the agreement between the University and the Graduate Employee Organization. Details of public holidays, personal leave and vacation eligibility can be found in the Graduate Appointments Policies and Procedures issued by the Graduate School. While the Department is flexible in setting working conditions, any proposed departure from the terms of the contract should be discussed with the student's supervisor well in advance.

3.5 Safety Training

Prior to conducting any work in a research laboratory, students must undergo safety training as prescribed by the Department's safety committee. Documentary evidence of the satisfactory completion of this training must be filed with the GPD. Safety training typically includes the lab-safety class during orientation, as well as web-based training provided by the University's Environmental Health and Safety organization.

4.0 Residency and Enrollment Requirements

4.1 Residency Requirement (9 credits for two consecutive semesters)

Each Ph.D. candidate is required by University regulations to spend a minimum of one continuous academic year in full-time graduate work. This is defined as at least two consecutive semesters in which (a) at least nine credits are taken per semester in graduate courses (which may include doctoral dissertation) and (b) the student is physically present on the campus for some part of each week. Most chemistry students satisfy this requirement in the first year of their academic program.

4.2 Continuous Enrollment

Graduate students are required by University regulations to maintain continuous enrollment by registering for the appropriate course credits or by paying the Continuing/Program Fee. A student who is not properly enrolled will be withdrawn by the University at the end of the Late Registration Period. Reinstatement requires the approval of the GPD and the payment of a fee.

4.3 Full-Time, etc. Status

Students are considered to be full time if they are registered for nine or more credits and part time if they are registered for eight or fewer credits. For the purposes of loan deferments, students taking six to eight credits are considered to be half time. If required, the Department will certify that a student actively engaged in research or dissertation (or thesis) production is to be considered a full time (or half time) student regardless of the number of credits for which the student is registered.

5.0 Length of Program (Statute of Limitations), Extensions, Candidacy

In May 2009 the Graduate School revised its policy on extensions and instituted a policy on candidacy. A major improvement is that doctoral students entering with a masters degree are no longer automatically given a shorter, four-year Statute of Limitations (SOL): now all PhD students will have a six-year initial SOL.

5.1 Statute of Limitations (SOL)

The statute of limitations is the amount of time allowed for completing the graduate program and is stipulated in the admission letter from the Graduate Dean. As already noted, doctoral students are given six years to complete the program. If an extension becomes necessary, the student's adviser will need to provide a written justification to the GPD, including a timeline for completion of the remaining requirements.

5.2 Extensions

The Graduate School now prefers that extensions be for two-year intervals. However, the actual length of the extension may be determined by such factors as how long the student has been in the program, how many extensions have already been granted, and progress in the graduate program. The newer two-year extension will apply more to newer students. Also, with the new policy on SOL's and extensions, the Graduate School may be less willing to grant extensions.

5.3 Candidacy for the PhD Degree

As of May 2009, the Graduate School requires that doctoral students complete their program ***within five years of achieving candidacy***. In the Chemistry Department candidacy is achieved after passing both the Prospectus and ORP defenses -- the same requirement for passing the Preliminary Comprehensive Exam. These milestones are usually passed at the 2.5-year mark. Note: The Graduate School's new SOL, extension, and candidacy rules do not affect the Chemistry Department's policy on support.

6.0 Coursework Requirements

See section 16.0 for a list of general requirements regarding coursework.

Breadth of educational experience is afforded by the requirement that each graduate student take the core course and one or two graduate level courses (numbered 500 or above) in each of the first two semesters. A minimum GPA of 3.0 is required to advance to the second year of the program. The situation of students who do not achieve this minimum will be reviewed by the Graduate Program Committee who will consider all the relevant circumstances and any documentation submitted by the student and adviser, and will recommend an appropriate course of action to the GPD.

CHEM 892: Registration in CHEM 892 officially accounts for all active student and provides an accurate reflection of the status of the program and of the faculty work-load involved. Consequently, registration for this course is necessary every semester. Only in exceptional circumstances, and with permission of the dissertation adviser and GPD, may this requirement be waived.

Journal Club: Beginning in the second or third semester, and continuing for at least four semesters, students will take at least one of the several Journal Club courses offered. The format of the course will vary by division and students will be informed of the detailed format by the faculty member responsible for the course. Participation will include at least one 25-minute seminar presentation.

Additional/Other Coursework: Some divisions have additional course-work requirements and some have seminar presentation requirements. Students should consult with their division secretary and/or adviser for details. The student's research adviser is the primary source for course advising in general.

Dissertation Credits: 18 credits (cumulative) of CHEM 899 are required for the Ph.D.

Students who are retracked to the masters level may chose between thesis (CHEM 699, 10 credits) or non-thesis. (There is no course number for a non-thesis masters project.)

Note: Pre-registration is strongly encouraged for graduate level courses, which are subject to cancellation if a minimum enrollment is not achieved.

7.0 Research Advisers and Divisions

Students are required to participate in a number of activities related to the choice of research area and the selection of a dissertation/thesis adviser. Potential advisers are all members of the graduate faculty in Chemistry and a small number of faculty from related departments who have adjunct faculty status (a list of these may be found in the Graduate School Bulletin). Students should bear in mind that faculty are not required to accept particular students as members of their research groups and may, for a variety of reasons, not take any students in a given year.

The required activities include rotations, Faculty Research Seminar, and interviews with faculty. Students are expected to have an open mind about possible choices of topic and adviser and to develop at least two viable options. A student may be terminated from the graduate program if no faculty adviser has been appointed by the end of the first year of the program.

7.1 Rotation Requirements

During the first semester, each graduate student rotates through a series of three different research groups of their choice. The format of these rotations is determined by the various faculty members involved, but may include attendance at a weekly research group meeting, visits with graduate students in the lab, one-on-one meetings with the faculty member, and some research-related activities. A fourth and final rotation is taken in late December with a research group of the student's choice (and consent of the relevant faculty member). This may be a group with which previous meetings have occurred, or may not, according to the student's interest. It is also possible for students to spend rotation periods with adjunct faculty.

7.2 Faculty-Research Seminars

During the first semester (orientation week primarily), faculty will present a series of seminars outlining aspects of their research. Attendance at these seminars is required. Students register for CHEM 891F. Faculty may also present research related seminars on other occasions such as in the Departmental Seminar Program or at various research symposia held on campus. Students should regularly consult the notice boards near the Chemistry Office or the Department Web page for information on seminar presentations.

7.3 Faculty Interviews

During the first semester each incoming graduate student will consult with at least four faculty members concerning possible research projects. Faculty signatures are required on a form available from the GPD as evidence that these consultations have taken place.

7.4 Submission of Choices

Each student will submit to the GPD a list of at least four faculty members, each of whom might serve as adviser, arranged in order of preference. In consultation with the Head of the Department, the GPD will determine the compatibility of the student's choice with Departmental support guidelines and will authorize compatible choices. The assignment of research advisors should be completed by late January-early February.

7.5 Divisional Affiliation

Students are assigned to a division based on the consultations with faculty advisers during the orientation program prior to the start of the first semester. As there are divisional variations in program requirements, students are required to confirm their divisional, or interdivisional, affiliation at the time of submission of the choices for adviser. At this time students may change their divisional affiliation. A student may also follow a program which is a hybrid of two divisional programs. Consultation with the relevant faculty should take place as early as possible. Any such program must be approved by the GPD.

8.0 Dissertation Committees

The voting members of a Ph.D. dissertation committee consist of the dissertation adviser, two graduate faculty who are members of the Chemistry Department, and one member of the graduate faculty from another department, known as the outside member. If the dissertation adviser is from a Department other than

Chemistry, then he/she must be appointed as graduate faculty in the Chemistry Department and another committee member will be necessary as the outside member.

Members are identified in discussions between the student and adviser. Typically, the student takes responsibility for informally approaching potential committee members. Once informal agreement to serve has been obtained, the adviser provides notification to the GPD, who in turn, recommends the appointments to the Graduate Dean.

Other, non-voting members may be appointed. These could be research collaborators from another university, industry or government laboratory. The Graduate School discourages the appointment of other voting members, though this is possible under the appropriate circumstances.

The Ph.D. dissertation committee may meet as often as the chair deems necessary, but must meet to examine the dissertation prospectus, original research proposal, data for the dissertation, and the dissertation per se. For the student the examination by the committee of each of these documents and phases of the dissertation process is considered a defense (prospectus defense, ORP defense, data defense, final defense). Once the adviser determines that the student is ready, it is the student's responsibility to schedule each of these meetings/defenses, including the room and projection equipment.

Yearly meetings to assess research progress are recommended after the ORP, particularly between the ORP and the data defenses. These additional meetings are not defenses; they are intended simply to ensure continued contact (communication) between student and committee.

9.0 Dissertation Prospectus

Before the end of classes in the *fourth* semester in residence, the student will schedule a meeting of the dissertation committee to present the prospectus, and will submit a copy of the prospectus to the committee chair. After the prospectus is successfully defended to the committee, the approved document must be submitted to the GPD, along with a progress form signed by the committee chair indicating that the student has successfully presented/defended the prospectus.

10.1 Format of the Prospectus Document

At least 6 pages in length, not including supporting documentation (i.e., references, figures, tables and appendices). For these purposes, a page has 1-inch margins, is double-spaced and each line has 70 characters in a 12 point font.

10.0 Original Research Proposal ("ORP")

Before the end of classes in the *fifth* semester in residence, the student will schedule a meeting of the dissertation committee to present the Original Research Proposal and will submit the ORP document to the committee chair. The committee will conduct an oral examination of the student in which the student's background knowledge and specific knowledge of the fields of research will be examined. After successful defense of the ORP, a copy of the ORP document should be submitted to the GPD (signatures not required) along with a progress form, signed by the committee chair.

10.1 Role of the Committee Chair in the ORP

The dissertation adviser chairs all meetings of the dissertation committee except the ORP presentation/defense, at which another member acts as temporary chair. At the ORP examination, the dissertation adviser is a speaking, but not a voting, participant in the proceedings.

10.2 White Paper

A white paper of two pages (2-page maximum) describing the ORP must be submitted to each member of the committee at least four (4) weeks before the ORP defense. The committee will vote up or down on the white paper.

10.3 Format of the ORP Document

At least 4 pages in length, not including supporting documentation -- i.e., references, figures, tables and appendices. (Signatures not required on the copy submitted to the GPD.)

10.4 Possible Outcomes of the ORP

Pass, Fail, M.S. Pass, or in exceptional cases, Conditional Pass. (This last outcome would require that the examining committee provide written details of the conditions to the student). The dissertation adviser can require the committee to give one and only one oral re-examination at the end of a 90-day period, measured from the date of the last class in the semester in which the examination was scheduled.

11.0 General Notes re Prospectus and ORP

The detailed format of the prospectus and the ORP may vary depending on the topic and the divisional preferences. The role of the committee is to assess whether the student will, if allowed to proceed, produce a dissertation in line with the graduate school's requirements described in section 1.2 above. In other words, the committee will be looking for evidence that the student is able to "review and make critical use of the literature; formulate a problem, plan a method of attack, . . . summarize the material or data, and draw conclusions based thereon." The documents and the examination for the Prospectus and for the ORP further give students an opportunity to demonstrate their written and oral communication skills.

12.0 Preliminary Comprehensive Exam and Candidacy

The Graduate School requires doctoral students to pass a "preliminary comprehensive examination conducted by the major department." As noted in sec. 5.3, the requirements for the Preliminary Comprehensive Examination in the Chemistry Department also satisfy the Department's requirements for candidacy: successful Prospectus and ORP defenses and documents. (The defenses must be passed fully, not conditionally.) Once these milestones are passed, the student becomes an official candidate for the Ph.D. – i.e., achieves candidacy.

13.0 Data Defense

When the student and the adviser agree that sufficient data have been amassed to justify a meeting of the committee for the purpose of defending the data, a Data Defense meeting is scheduled. This meeting may occur at any time in the academic year, but must occur *at least three months before the final defense*. The committee may suggest further work to be done; however, the committee normally approves the data for write-up subject to whatever constraints it wishes to impose.

14.0 Final Defense, Dissertation Seminar

The final meeting of the committee occurs when the student defends the completed dissertation or thesis. After the public presentation (the seminar), the student meets separately with the committee and interested members of the graduate faculty, who then examine the candidate fully on the subject matter of the dissertation or thesis and such other topics as may seem relevant. When the student's performance is evaluated, only the committee members may vote. The result of this examination is reported in timely fashion to the Graduate Program Director, who then notifies the Graduate School.

Doctoral dissertations are announced in the campus online newspaper. (Masters theses are not.) There are also departmental announcements and posters for both dissertation and thesis defenses.

14.1 Production of the Dissertation (Formatting Requirements)

The dissertation must be produced in accordance with the University regulations. While there is some choice of layout, order of presentation of material, font size, format of tables and figures and so on, the University's regulations are rather restrictive. Students are strongly advised to familiarize themselves with the relevant regulations before investing time in the production of a dissertation. The Graduate School issues detailed written instructions and will read a specimen chapter and provide critical feedback on matters of format and production. The regulations change from time to time, so a previous dissertation may not be an accurate model. A copy of the dissertation should be prepared for each member of the dissertation committee in addition to the copies required by the Graduate School.

14.2 Required Notice of Final Doctoral Dissertation Defense

The Graduate School requires timely public notice of the final defense: *four (4) weeks'* lead-time is necessary for publishing PhD defense notices in *The Loop*, the campus online newspaper. The relevant information about the defense should be given **to the GPD five (5) weeks** prior to the proposed defense-date.

The final defense may be scheduled at any time during the calendar year, but must occur *at least seven months after the approved prospectus is received by the Graduate School.*

15.0 Seminar Presentations

The development of oral communication skills is considered important and students are provided with a number of opportunities to make oral presentations. Divisional requirements vary with regard to seminar presentations and students should consult with their adviser and divisional secretary.

15.1 Research Seminars, Journal Clubs, Research Groups

Some Divisions require one or more formal seminar presentations on topics not related directly to the student's dissertation research. Some journal club formats will require a formal presentation, other may involve a more informal discussion format. Some faculty research group meetings may involve presentation and discussion of research papers and/or research results.

15.2 Research Symposium

By the end of the fourth year, all students are expected to have presented at least one talk or poster at the annual Departmental Research Symposium (Research Fest, Poster Fest).

15.3 Conference Presentations, Publications

The Chemistry Department expects students to demonstrate progress in research by submitting material for presentation (oral presentation or poster) at regional, national or international conferences as deemed appropriate in consultation with the research-adviser.

15.4. Conference Travel Funds

Where faculty research-funds are not available to help defray travel expenses, the Department and Graduate School offer some support for conference attendance. Chemistry Department Travel Grants allow each graduate student a one-time, maximum \$300 grant for conference travel. The Graduate School has a rolling basis for application and awards of its travel grants. Students should consult with their research-adviser and/or the GPD in regard to application for travel funds.

15.5. Publications

It is also expected that ***by the time of the final defense of the dissertation or thesis, manuscripts will have been submitted for publication*** in the primary refereed literature.

15.6 Dissertation/Final Defense Seminar

(See above, sec. 14.0, "Final Defense, Dissertation Seminar.")

16.0 Summary of Requirements for the Ph.D. Degree

16.1 *Successful completion of graduate-level coursework in major field:*

- **Core Course:** each of first two semesters (CHEM 891G)
- **Divisional course-work requirements** (if any)
- **Other graduate courses:** first year; 4 max (may vary depending on divisional requirements)
- **Faculty Research Seminar:** first semester (CHEM 891F)
- **Journal Club:** at least four semesters (various course numbers)
- **Research/Group Meeting:** every semester (CHEM 892)
- **Dissertation Credits** (accumulate 18 credits of CHEM 899)

16.2 Divisional seminar presentations as required and delivery of either an oral or poster presentation at Research Symposium by the end of the fourth year.

16.3 Dissertation Prospectus*

16.4 Original Research Proposal*

16.5 Data Defense

16.6 Dissertation

16.7 Oral (Final) Defense of the-Dissertation

16.8 Any other Graduate School requirements, such as Residency Requirement, submission of graduation-related forms, fees and the dissertation.

**(Preliminary Comprehensive Exam and Candidacy-requirements)*

Masters Degrees

Three possibilities exist for M.S. degrees depending on the individual student's circumstances:

- *The first two (sec. 17.0 and 18.0) are terminal degrees for students who leave the PhD track.*
- *The third (sec.19.0) is an option for doctoral students who wish a Masters en route to the PhD.*

17.0 **M.S. with Thesis** (*terminal degree*)

Students are normally admitted to the Chemistry Graduate Program on the basis of pursuing studies leading to the award of the degree of Ph.D. However with the agreement of the GPD and (if relevant) the student's adviser, a student may pursue studies leading to the award of M.S. degree by research: the Thesis Masters. The Chemistry requirements are in line with those of the Graduate School and students are advised to study carefully the relevant paragraphs in the Graduate School Bulletin. The requirements for the masters degree by thesis research are listed below. The same standards are used to evaluate satisfactory performance in the M.S. degree program as in the Ph.D. program.

17.1 Ten (10) credits of CHEM 699 (Masters Thesis)

17.2 Coursework in Chemistry for the M.S. Degree with Thesis

At least 21 credits from the following:

- The Core Course in each of the first two semesters.
 - Faculty research seminar in the first semester
 - At least two semesters of journal club.
 - Research group meeting (CHEM 892) each semester.
 - Any divisional course-work requirements.
 - Electives chosen in consultation with the adviser.
- At least 15 of these 21 credits must be taken on a letter graded basis and these must include at least six credits earned in the 600 - 800 series (not counting journal clubs, seminars or group meeting).
- Letter-graded courses submitted for the degree must have a GPA of 3.0 or better.

17.3 Masters Thesis

Expectations and requirements for the thesis are comparable to those for a dissertation. (See 1.2 “General Philosophy of Program,” 14.0 “Final Defense, Dissertation Seminar” and 14.1 “Production of the Dissertation.”)

17.4 Masters Thesis Committee

The voting members of a masters thesis committee are the adviser and at least one other member of the Chemistry graduate faculty. The identification and appointment of thesis committee members is as described above for a dissertation committee.

17.5 Thesis Outline (Prospectus)

A written Thesis Outline, the M.S. version of a prospectus, is presented and defended orally before the thesis committee. This requirement must be completed and the outline received by the graduate school at least *four months* before the defense of thesis final oral examination.

17.6 Oral Defense of the Thesis

Candidates for the M.S. Thesis degree must have an oral defense of the thesis. The format and requirements of the thesis defense are the same as for the dissertation defense, including public seminar followed by oral defense in front of the thesis committee. Announcements of thesis defenses are also posted and advertised in the department.

17.7 Any other Graduate School requirements relating to credits, GPA, the filing of forms and any fees for graduation, submission of the signed thesis.

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18.0 **Non-Thesis M.S. (terminal degree)**

Under exceptional circumstances a student may petition to be permitted to submit for a terminal non-thesis Masters degree. The requirements are as set out in the Graduate School Bulletin and will include, among other requirements, the passage of a Masters General Examination (“MGE”). The form of this examination will be decided on a case by case basis.

## 18.1 Masters General Exam/Non-Thesis Committee

The committee for a non-thesis M.S. consists of the committee-chair\* and one other committee member, who may or may not be from the Chemistry graduate faculty. \*(Depending on the individual circumstances, the committee chair may or may not be the research-adviser.)

## 18.2 Masters General Exam

The MGE occurs in the presence of *the committee only*: there is no public aspect. Again, the format of the MGE, as well as the basis for the Exam – the project, research, etc. -- can vary widely depending on the individual student's particular situation.

## 18.3 Any other Graduate School requirements relating to credits, GPA, the filing of forms and any fees for graduation.

*(Note: The Graduate School does NOT receive a copy of the Master General Exam document/project.)*

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19.0 **M.S. en Route to the Ph.D.**

Ph.D. students who have completed the Preliminary Comprehensive Examination requirement and who have 30 credits, in accordance with University requirements, may submit for a non-thesis M.S. degree that is awarded “en route to” the Ph.D. The requirements are 21 credits in the major field, at least 12 credits in 600-800 level courses, at least 15 credits on a letter-graded basis, and a GPA of 3.0 or better on those letter-graded courses submitted for the degree.

The same requirements for the terminal non-thesis M.S. apply to the M.S. en Route in terms of credits, GPA, and filing the Degree Eligibility Form. However, there is *no MGE or other exam/defense*.

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