

Requirements and Regulations for Graduate Degrees

This document was approved by the Department on August 9, 2006.

Graduate Student Responsibility

All graduate students will be provided with a current copy of this document. The student is responsible for becoming familiar with the content of this document and for following the specific requirements and regulations outlined. Note that failure to follow all the departmental requirements and time limits outlined in this document is considered unsatisfactory progress toward a graduate degree and may result in delay in graduation, denial of financial assistantship support, and/or termination from the graduate program.

Student Advisement

Placement Examinations

During the week before the beginning of classes, each admitted student is given written examinations (ACS standard or equivalent examination) in the five divisions of chemistry: analytical, inorganic, organic, physical, and biochemistry. Every student is required to take at least three exams. The results of these examinations are used to advise the student regarding any deficiencies to be corrected, and to place the student in appropriate courses as determined by a Graduate Student Advisory Committee. Therefore, we strongly encourage and expect all beginning students to review the appropriate undergraduate material before taking these examinations. Failure to pass the exams will generally require that the student take some remedial coursework.

Introduction to Research Techniques

All graduate students must register for Chemistry 592, Introduction to Research, during the first fall semester in residence.

Advisement

At the beginning of the first semester in residence, each admitted student will meet with the Graduate Advisor to plan the semester's course work and register for classes. Each student must select a research director, preferably during the first semester, but no later than the end of the second semester. After selecting a research director, the student must obtain the advice and approval of the research director for course registration. The Graduate Advisor may approve registration in the research director's absence.

Assistantship Support

Continuation of assistantship support is contingent upon the student making satisfactory progress toward a degree. In addition, continuation of teaching assistantship support

depends upon satisfactory performance of assigned duties. The graduate school has established time limits for financial support. A student may receive no more than two calendar years of graduate-student support while a master's level student. A student may receive no more than four calendar years of graduate-student support while a doctoral-level student. Students directly admitted into a doctoral program from their bachelor's degree can receive up to five calendar years of support. (Limited time extensions may be granted under appropriate circumstances) The maximum number of years of graduate-student support for students seeking any combination of graduate degrees is six (72 months) unless a specific exception based on the student's programmatic needs is granted by the graduate dean. These time limits apply to assistantships, fellowships, traineeships, and other similar awards and appointments administered by the University, regardless of source of funds.

Minimum Registration

All students admitted to the department will register for a minimum of 9 credit-hours every semester in residence except during the first semester, summer sessions, and while registered for Chem 601 only. In the first semester, the students must register for a minimum of 6 credit-hours, and a minimum of 3 credit-hours in every summer session. Registration for less than this requirement is not considered satisfactory progress toward a degree.

Master's Degree Requirements

Each student must fulfill the requirements of both the Graduate School and the Department of Chemistry and Biochemistry to be awarded a Master of Science degree in Chemistry. The student is responsible for knowing these requirements and fulfilling them in a timely manner.

The departmental requirements and procedures for the Master's program follow. For the convenience of the student, a summary of the Graduate School's requirements are also included here, but the student should also consult the graduate catalog for the complete requirements. _

Admission to the Master's Program

Students are admitted to the master's program by the graduate school only upon recommendation of the Department Admissions Committee. Qualified students who wish ultimately to obtain a Ph.D. degree are encouraged to apply for direct admission to the doctoral program.

Research Director and Graduate Committee Selection

Each student must select a research director and graduate committee no later than the end of the second semester in residence. The student should obtain a Graduate Advisor

selection form and must interview at least four faculty members before selecting a research director and assembling a graduate committee. Each faculty member interviewed should initial the selection form. After selecting a research director, the student, in consultation with the research director, should select a graduate committee and request each member of the committee to serve. The members of the committee indicate their willingness to serve by signing the selection form. This request to form a committee is approved by the department Chair or by the Graduate Advisor if delegated by the Chair.

The committee shall consist of: the research director (Chair of the committee), at least one member of the major division other than the research director and a member outside the major division. The chair of the Department of Chemistry and Biochemistry, if not otherwise appointed, is an ex-officio member of every graduate committee. Master's committees do not require a member from outside the department, but students transferring into the doctoral program must add an outside member to the committee. An additional member or members may be appointed to the committee if desired by the student or research director. _

Graduate Committee Functions

The committee will meet as soon as possible after being appointed to plan the student's program of study. It is the student's responsibility to see that the committee is formed and that this initial meeting is scheduled within six months after the date the student has chosen a research director. At this time the progress and program form is completed and filed with the Graduate Advisor. The committee will meet whenever necessary (but at least once per year) to (1) review the student's progress in courses and suggest and approve changes in the program of study, (2) evaluate the student's progress in research and make appropriate recommendations and (3) determine whether the student should continue toward a degree. If continuation is denied, the committee must notify in writing the department Chair of the reasons for this denial. After the student completes the program of study, a research project and a thesis, the committee will read and evaluate the thesis and conduct a final oral examination.

Research Tools

The department requires no specific research tools. A student's graduate committee, taking into account the student's background and the needs of the research area, may require that the student acquire one or more research tools (e.g., foreign language, computer programming, statistics, etc.). It is the student's responsibility to see that any research tool requirement is completed before scheduling the final oral examination.

Formal Coursework Requirement

Each student must complete the courses specified by the student's graduate committee in the program of study. Generally, these will include the courses specified by the major division for master's degree students. (See Appendix II.)

The minimum course requirement for Master's students follows the "2+1" format. All master's students must take for credit at least two courses (six semester hours) within the student's major field (courses listed in Appendix II) and at least one (three semester hours) from outside the major field. For guidelines on suitable courses outside the major division see Appendix III. Chemistry 594, special readings, cannot be used to meet this requirement. A student's graduate committee may increase any of these departmental course requirements.

For a student working in a cross-divisional area, the committee will design an appropriate program of study in consultation with the Graduate Advisor and the faculty of the divisions involved.

Each student for graduation must earn at least 30 credit hours at the 400- or 500-level. At least 15 of these 30 hours must be at the 500-level. These 15 hours include 500-level credit graded S/U such as Chem 592, 597, 598, and 599. At least 21 of these 30 hours must be formal coursework with grades of A, B, or C. These 21 hours include 400-level coursework within or without the department.

First Year Evaluation

The faculty, meeting as a committee-of-the-whole, will review the progress of all graduate students at the end of their first year in residence. For students in the master's program the faculty can:

1. recommend petitioning the Graduate School to allow direct entry to the doctoral program (accelerated entry option). Such petition can be made anytime after one semester in residence.
2. recommend continuation in the master's program with option to petition the Graduate School to grant a master's degree equivalency. When granted, this allows the student to apply to enter the doctoral program after completing all degree requirements except writing and defending a thesis.
3. recommend continuation in the master's program with option to petition to enter the doctoral program after completion of a master's thesis.
4. recommend continuation in a terminal master's degree program.
5. request that the Graduate School terminate the student from the program (giving cause).

Seminar

A student in the master's program must attend weekly departmental seminars and must earn one credit hour of Chemistry 595 by presenting a graded departmental seminar.

Grade Point Average

All students must maintain at least a 3.00 GPA

The Graduate School places any student whose GPA falls below 3.00 on academic probation. Any student who is on academic probation and has been on academic probation for at least one academic term and who has accumulated six or more hours of C or its equivalent unbalanced by A in 400- or 500-level courses will be dropped from the Graduate School. An overall GPA of at least 3.00 in all graduate work included in the master's degree program is required before that degree can be awarded. _

Research and Thesis

A research project is required of all graduate students. A student in the master's program must earn at least 3 but not more than 6 credit hours of thesis (Chemistry 599) and at least 8 credit hours total in research and thesis (Chemistry 596, 598 and 599). Master's degree research (Chemistry 596) is limited to 6 credit hours and cannot be taken until at least 9 credit hours of graded coursework in the department have been completed. The results of the student's research must be presented in the form of a thesis acceptable both to the student's committee and to the Graduate School.

Extended Registration

A student who has completed all master's degree requirements with the exception of writing a thesis, and who is in the process of writing a thesis, must register for Chemistry 601 (1 to 12 credit hours per semester) until the thesis is completed and defended. A student has six calendar years to complete the degree. This time is calculated from initial enrollment to completion of all degree requirements including any document that must be approved by the graduate school.

Final Oral Examination

A student in the master's program must schedule and pass a final oral examination (defense of thesis). Copies of the thesis must be presented to members of the student's graduate committee at least one week before the examination.

Doctoral Degree Requirements

Each student must fulfill the requirements of both the Graduate School and the Department of Chemistry and Biochemistry to be awarded a Doctor of Philosophy degree in Chemistry. The student is responsible for knowing these requirements and fulfilling them in a timely manner.

The departmental requirements and procedures for the doctoral program follow. For the convenience of the student, a summary of the Graduate School's requirements are also

included here, but the student should also consult the graduate catalog for complete requirements. _

Admission to the Doctoral Program

A student with a baccalaureate degree may be admitted to the doctoral program by the Graduate School if recommended by the Department Admissions Committee. Students admitted to the Master's program may transfer to the Doctoral program via the Accelerated Entry option or the Master's Equivalency if approved by the Faculty of the department at the student's first year review and by the student's master's committee. (See the Graduate School Catalog for definitions of these terms and descriptions of the procedures.) Admission following completion of a Master of Science degree in this department is possible if approved by the faculty of the department.

The Department of Chemistry & Biochemistry encourages students who have obtained undergraduate degrees in this department to apply for admission to doctoral programs elsewhere. It is in the student's best interest to broaden his or her education.

Research Director and Graduate Committee Selection

Each student must select a research director and graduate committee no later than the end of the second semester in residence. The student must obtain a selection form provided by the Graduate Advisor and interview at least four faculty members before selecting a research director and graduate committee. Each faculty member interviewed should initial the selection form. After selecting a research director, the student, in consultation with the research director, will select a graduate committee and request each member of the committee to serve. The members of the committee indicate their willingness to serve by signing the selection form. This request to form a committee is approved by the department Chair or Graduate Advisor. The committee shall consist of the research director (Chair), at least one member of the major division other than the research director, a member outside the major division, and a member outside the department. The committee must have a minimum of five members. The chair of the Department of Chemistry and Biochemistry, if not otherwise appointed, is an ex-officio member of every graduate committee. An additional member or members may be appointed to the committee if desired by the student or research director. A student entering the doctoral program from the master's program may either establish a new graduate committee or keep the existing committee (provided it is properly constituted for the doctoral program).

Graduate Committee Functions

The committee will meet as soon as possible after being appointed to plan the student's program of study. It is the student's responsibility to see that the committee is formed and that this initial meeting is scheduled within six months after the date the student has chosen a research director. At this time the progress and program form is completed and filed with the Graduate Advisor. The committee will meet whenever necessary (but at

least once per year) to (1) review the student's progress in courses and suggest and approve changes in the program of study, (2) evaluate the student's progress in research and make appropriate recommendations, and (3) determine whether the student should continue toward a degree. If continuation is denied, the committee must notify in writing the department chair of the reasons for this denial. For students admitted to the doctoral program without a master's degree, the committee may require the preparation and defense of a master's thesis even if previous approval of directly pursuing a Ph.D. degree has been given by the faculty. After the student completes the cumulative examination series and an original research proposal, the committee will administer the preliminary oral examination (see below). After the student completes the program of study, a research project, and a dissertation, the committee will read and evaluate the dissertation and conduct a final oral examination (see below).

Research Tools

The department requires no specific research tools. A student's graduate committee, taking into account the student's background and the needs of the research area, may require that the student acquire one or more research tools (e.g., foreign language, computer programming, statistics, etc.). It is the student's responsibility to see that any research tool requirement is completed before scheduling the preliminary oral examination.

Formal Coursework Requirement

Each student must complete the courses specified by the student's graduate committee in the program of study. Generally, these will include the courses specified by the major division for doctoral degree students. (See Appendix II.)

The minimum course requirement for doctoral students follows the "2+2" format. All doctoral students must take for credit at least two courses (six semester hours) within the student's major field (courses listed in Appendix II) and at least two courses (six semester hours) from outside the major field. For guidelines on suitable courses outside the major division see Appendix III. Chemistry 594, special readings, cannot be used to meet this six hour requirement. Courses taken while in the master's program may be applied to these department course requirements. A student's graduate committee may increase these course requirements.

For a student working in a cross-divisional area, the committee will design an appropriate program of study in consultation with the Graduate Advisor and the faculty of the divisions involved.

First Year Evaluation

The faculty, meeting as a committee-of-the-whole, will review the progress of all graduate students at the end of their first year in residence. For students in the doctoral program the faculty can:

1. recommend continuation in the doctoral program.
2. recommend transfer to a terminal master's degree program.
3. request that the Graduate School terminate the student from the program (giving cause).

Seminar

A student in the doctoral program must attend weekly departmental seminars and must earn three credit hours of Chemistry 595 by presenting departmental seminars. These seminars include one based on the current literature, the second on the topic of an original research proposal, and the final seminar on the student's own research. Only the last two seminars are required of students entering the doctoral program with a recognized master's degree or who have presented an acceptable seminar in the master's program of this department before transferring to the doctoral program.

Grade Point Average

All students must maintain at least a 3.00 GPA. No course in which the grade is below C counts toward the Ph.D. degree; however, the grade does count in the student's GPA.

Preliminary Examination

Each student in the doctoral program must pass a preliminary examination before being advanced to candidacy. The first portion of the preliminary examination is given by cumulative exams. The second portion of the preliminary examination is the preparation and oral defense of an original research proposal. The preliminary examination process generally will begin in the second year of full time study or its equivalent beyond the baccalaureate and will be completed within a period of no more than three regular academic semesters (summers not included).

Cumulative Examinations

Ten cumulative examinations are scheduled each calendar year with four examinations in each fall and spring semester and two in the summer session. Students must begin taking cumulative examinations at the start of their second calendar year or immediately upon admission to the doctoral program if one calendar year has already been completed in the master's program. Students must declare their intention to begin taking these examinations to the Coordinator of Cumulative Examinations at least one week before taking their first examination. Thereafter, examinations must be taken consecutively; students who do not take an exam for any reason will be given a "Fail" grade for the missed exam.

Generally, all cumulative examinations are taken in the major division. In the case of a cross-divisional student, the graduate committee will establish a schedule by which the examinations are to be divided between divisions. The established schedule must be followed by the student.

Cumulative examinations may be written, oral, or take-home examinations. All divisions will give their written examinations simultaneously at a time and place posted at least ten days in advance. The subject of an examination may be announced in advance at the discretion of the faculty member preparing the examination.

Each examination will be prepared, graded, and recorded by one member of the faculty who will determine the pass-fail line on that examination. Each division will determine the faculty member responsible for each scheduled cumulative examination.

Each student must pass four (4) examinations in no more than ten (10) consecutive trials in order to continue for the doctoral degree. The student is not liable for any examinations during any time when not enrolled in school. If a cumulative examination is not available at the scheduled time for any reason, the examination will be rescheduled, using a date and time that is within seven days of the originally scheduled examination and which is convenient to the students' schedule.

The faculty member responsible for grading an examination will give the results of the examination in writing to the Cumulative Examination Coordinator. The Cumulative Examination Coordinator will notify each student taking the examination whether the examination was passed or failed. Copies of this notification will be sent to the Graduate Advisor, the Research Director, and the student's file.

Research Proposal and Preliminary Oral Examination

The preparation and defense of an original research proposal serves as the second portion of the preliminary examination. For this portion, there exists a Proposal Evaluation Committee (PEC) to consist of the student's entire graduate committee except for the member from outside the department. The department chair, if serving on the graduate committee as an ex-officio member, will be a non-voting member of this PEC. Initial work on the proposal should be initiated when the student begins taking cumulative examinations, as the first draft of the written proposal (see below) must be submitted to the PEC before the end of the student's fifth semester.

The student chooses the topic for an original research proposal. The topic must be approved by the Proposal Evaluation Committee (PEC) at a meeting in which the student outlines the proposal idea. The topic may use the techniques of the student's research project, but must not be an extension of the project. The proposal must be original with the student.

After obtaining approval of the topic, the student will prepare a written proposal in accord with the prescribed format. (See Appendix IV.) During preparation, the student

may obtain advice and suggestions from any faculty member but the proposal itself must be original with the student.

The student must complete preparation of the proposal and submit it to the PEC before January of his or her third calendar year. The committee is allowed one week for evaluation of the proposal. The evaluation will include at least one meeting of the PEC. The evaluation shall be by a numerical score from 1.0 (lowest) to 4.0 (highest). An average score of 3.0 shall be required to pass. The scores will be accompanied by a written review by each voting PEC member.

If the score is less than 3.0, the proposal must be revised and resubmitted within 30 days. The re-evaluation will follow the same procedure as described above. Only one re-submission is allowed. A second failure will be reported in writing by the PEC to the Department Chair and to the Director of Graduate Studies. The latter will request that the Graduate School terminate the student from our doctoral program. In most cases, the students will be eligible for a Master's degree.

Copies of the final approved proposal must be provided to all members of the student's graduate committee at least one week before the date of the preliminary oral examination.

Within 30 days of receiving notification of a passing grade, the student shall schedule a preliminary oral examination (defense of the proposal). This oral defense shall consist of a formal open seminar at which the student will present the proposal for credit as Chemistry 595. After questions from the general audience, the student's graduate committee will conduct an oral examination of the student. The grade for Chemistry 595 is based on the oral presentation and is independent of the oral examination.

Only one attempt is allowed to pass the preliminary oral examination (defense of the research proposal). However, if the committee cannot decide whether to pass or fail the student at the end of the scheduled examination time, they may vote to continue the examination at a later date. Only one such continuation is allowed. The decision of the committee to pass the student or to continue the examination must be made with a majority vote of the committee. The student, the department Chair, and the director of graduate studies will be notified by the Chair of the graduate committee in writing on the next working day after the examination whether the result was Pass, Fail, or Continue. If a continuation is required, it must be scheduled no earlier than 30 days and no later than 90 days after the original oral examination date.

Research

A research project is required of all graduate students. A student in the doctoral program must earn at least 32 credit hours in research and dissertation (Chemistry 598 and 600). A minimum of 24 hours must be dissertation credit (Chemistry 600). The results of the research must be presented in the form of a dissertation acceptable both to the student's committee and to the Graduate School.

Admission to Candidacy

Formal admission to Ph.D. candidacy is requested after the student passes the preliminary examination as described above and has satisfied all other preliminary requirements including the research tool requirement (if any) and the graduate school residency requirement. The graduate school requires a residency of 24 credit hours on campus as a doctoral student in a period not to exceed four calendar years with no more than 6 hours of deferred dissertation credit applied. The request for admission to candidacy is made by the Chair of the student's graduate committee to the Dean of the Graduate School through the departmental Director of Graduate Studies.

Dissertation

After being admitted to candidacy, the student must complete a dissertation showing that the student is capable of independent research. A successful dissertation usually represents the most extensive and intensive scholarly research work the student has performed to date. While working on the dissertation, the student must register for Chem 600. The student is to devote at least one academic year of full-time work to complete the dissertation and will register for 24 semester hours of Chem 600 dissertation credit, for example, 12 hours for each of two terms. Students who have registered for 24 semester hours of dissertation credit and have not completed the doctoral dissertation are subject to the continuing extended enrollment requirement described in the next section.

Extended Registration

A student who has completed all doctoral degree requirements with the exception of writing a dissertation, and who is in the process of writing a dissertation, must register for Chemistry 601 (1 to 12 credit hours per semester) until the dissertation is completed and defended.

Final Oral Examination

A student in the doctoral program must schedule and pass a final oral examination (defense of dissertation). The student will present a departmental seminar for credit (Chemistry 595) based on the results of the research. After questions from the general audience, the student's graduate committee will conduct an oral examination of the student. The grade for Chemistry 595 is based on the seminar presentation and is independent of the oral examination. Copies of the dissertation must be presented to members of the student's graduate committee at least one week before the seminar and examination.

Appendix I

List of Approved Remedial Courses

- Analytical: Chem 434(2)
- Inorganic: Chem 411(3)
- Organic: Chem 444(3)
- Physical: Chem 461(3) or Chem 462(3)
- Biochemistry: Chem 451A(3) or 451B(3)

Appendix II

Divisional Courses Eligible for Degree Requirements

Analytical

Chem 531(3), Chem 532(3), Chem 533(3), Chem 534(3), Chem 535(3), Chem 536(3), Chem 537(3), and Chem 539(3).

Organic

Chem 541(3), Chem 542(3), Chem 543(3), and Chem 549(3)

Physical

Chem 560(3), 561(3), Chem 562(3), Chem 564(3), Chem 569(3), and Chem 468(3)

Materials

Chem 575(3), Chem 579(3), and Chem 479(3)

Appendix III

Guidelines on Eligible Coursework Outside the Major Division

- Regular 500-level chemistry courses outside the major division
- Outside the department courses will not count toward meeting this requirement.
- Only certain 400-level courses such as Chem 479 (as a course in the Materials division), Chem 439 (as a course in the Analytical division), and Chem 468 (as a course in the Physical division) may be used to meet this requirement. Other 400-level courses will not count toward meeting this requirement.

Appendix IV

Recommended Format for the Original Research Proposal

1. Specific Aims - limit one page
2. Significance - limit three pages
3. Background - limit five pages

4. Experimental Design and Methods - limit eight pages
5. Biographical Sketch - limit two pages
6. Literature Cited - no page limit
7. Proposal should be double-spaced and font size should be at least 12 points.