

**REGULATIONS REGARDING ADVANCED  
DEGREES IN THE  
CHEMISTRY DEPARTMENT  
AT SYRACUSE UNIVERSITY**

Master of Science, Non-Thesis Option  
Master of Science, Thesis Option  
Doctor of Philosophy

This is a supplement to the information contained in the Graduate Catalogue and Academic Rules and Regulations, which are parts of the Syracuse University bulletin series.

August, 2015 cx

## Summary of Requirements for **Master of Science, Non-Thesis Option**

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1. Breadth Examinations: pass in two of the four areas.
2. Course Load: 18 graduate credits in first two semesters
3. Course Work: 30 graduate credits, at least half in courses numbered 600 or above
4. Grade Point Average: 3.00 prior to graduation
5. Culminating Experience: literature study, public seminar, comprehensive examination based on coursework, or paper to be submitted for publication

*Details on these items are found below*

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## Summary of Requirements for **Master of Science, Thesis Option**

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1. Breadth Examinations: pass in two of the four areas.
2. Course Load: 18 graduate credits in first two semesters
3. Course Work: 30 graduate credits, at least half in courses numbered 600 or above
4. Grade Point Average: 2.80 after 2<sup>nd</sup> & 4<sup>th</sup> semesters and for first 30 graduate credits, 3.00 prior to graduation
5. Thesis: approved by research advisor and second reader before preparation of final copy
6. Oral Examination: on thesis (based on final copy) and related topics
7. Seminar: may be combined with thesis oral examination

*Details on these items are found below*

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## Summary of Requirements for **Master of Philosophy**

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1. Breadth Examinations: pass in three of the four areas.
2. Course Load: 18 graduate credits in first two semesters
3. Course Work: 48 graduate credits, at least two-thirds in courses numbered 600 or above
4. Grade Point Average: 2.80 after 2<sup>nd</sup> & 4<sup>th</sup> semesters and for first 30 graduate credits, 3.00 prior to graduation
5. First Year Report: submitted at the end of the first year of study
6. Research Proposal: formal, written proposal to student's doctoral committee
7. Second-Year Oral Examination: on research proposal and on student's research

*Details on these items are found below*

*N. B. Application for this degree, an option for students who plan to complete the requirements for the Ph.D., may be submitted upon admission to candidacy for the Ph.D., i.e. after passing the Second-Year Oral Examination.*

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## Summary of Requirements for **Doctor of Philosophy**

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1. Breadth Examinations: pass in three of the four areas
2. Course Load: 36 graduate credits in first four semesters
3. At least 15 graduate credits (excluding CHE 638/690/990/997/999) should be completed by the end of the 2<sup>nd</sup> semester
4. At least 18 graduate credits (excluding CHE 638/690/990/997/999) should be completed by the end of the 4<sup>th</sup> semester
5. At least 3 credits of CHE 600, seminar course (for students entering Fall 2015 and later)
6. Course Work: 48 graduate credits, at least two-thirds in courses numbered 600 or above
7. Grade Point Average: 3.00 after 2<sup>nd</sup> & 4<sup>th</sup> semesters, 3.00 prior to graduation (grades from CHE 638/690/990/997/999 are not counted in the GPA for this requirement)
8. First Year Report: submitted at the end of the first year of study
9. Research Proposal: formal, written proposal to student's doctoral committee
10. Second-Year Oral Examination: on research proposal and on student's research
11. Publication requirement: publish research results in peer-reviewed scientific journals.
12. Dissertation: approved by research advisor and second reader before preparation of final copy
13. Oral Examination: on thesis (based on final copy) and related topics
14. Seminar: may be combined with thesis oral examination

*Details on these items are found below*

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## Breadth Examinations

Every student must demonstrate a certain level of competence in fields of chemistry other than the one in which advanced study and research are carried out. To this end, the Department gives breadth examinations in four areas: inorganic chemistry, organic chemistry, physical chemistry, and biochemistry. All Ph.D., candidates must pass examinations in three of the four areas. All M.S. candidates must pass examinations in two of the four.

The examinations cover essentially undergraduate material, and are scheduled at three times during the academic year: (1) during the week prior to the beginning of the fall semester; (2) during the week prior to the beginning of the spring semester; and (3) during the week after final examinations of the spring semester. Students are encouraged to take examinations in all four areas. Each subject area will be assessed using nationally standardized American Chemical Society subject exams. A passing grade on a subject area breadth exam is determined by consensus of the faculty, but cannot be below 50% or the national mean for the specific American Chemical Society subject exam administered, whichever is lower.

Each student must take these examinations during the week prior to his/her first semester in residence, and has three opportunities to satisfy the examination requirements. Thus, the breadth examination requirement must be satisfied within the first year of residence. Failure to meet the breadth exam requirement in the first year of study will result in termination from the Ph.D. program. Petitions to take a fourth exam in the area of deficiency will not be considered.

Exceptions to this requirement may be made, by prior arrangement, for students with deficiencies in their undergraduate background. The responsibility of recognizing deficiencies and of taking remedial action lies with the student, although the faculty will advise incoming students on the basis of transcripts and results of the first breadth examination. Note that several courses are particularly useful to students having difficulty with their breadth examinations.

## Course and Grade-Point Requirements

The Chemistry Department's regulations, regarding course and credit requirements, conform to the Graduate School's requirements as specified in the Syracuse University Bulletin, Academic Rules and Regulations.

The minimum course load for full-time students in the first two semesters is eighteen hours of graduate work. This includes graduate courses in chemistry, biochemistry, and approved courses in other departments. Each first-semester student will be urged to take courses in several areas of chemistry. First-year students must obtain approval by petition to take courses outside the Chemistry Department. This must be done prior to registration.

Students in the M.S. Non-Thesis Option program are required to earn a minimum of 30 graduate course credits, of which at least half are numbered 600 and above. They must achieve a 3.00 average for these course credits prior to graduation. Students in the M.S. Thesis Option program must earn a minimum of 30 graduate course credits, and achieve a minimum grade-point average of 3.00 in all courses for the first 30 credits of graduate study. In addition, these students must have at least a 2.80 average in all graduate courses after their second and fourth semesters in residence.

Students in the Ph.D. program must earn a minimum of 48 graduate course credits, of which at least two-thirds are numbered 600 and above. At least 18 credits must be in courses excluding CHE 635, 638, 690, 990, 997 and 999. At least 15 credits of coursework, excluding CHE 638, 690, 990, 997 and 999, must be taken in the first two semesters. Students in the Ph.D. program must achieve a minimum grade-point average of 3.00 for all graduate courses presented for the degree. In addition, these students must have at least a 3.00 average in all graduate courses after the second and fourth semesters. The grade-point average used for the above requirements is calculated excluding all grades from CHE 635, 638, 690, 990, 997 and 999. Failure to maintain a grade-point average of 3.00 at the afore-mentioned times will result in termination from the Ph.D. program. Students who meet the appropriate degree requirements may transition to the M.S. program. Such students are not eligible for reentry into the Ph.D. program.

Beginning in fall 2015, to be admitted to candidacy, students must have completed at least 3 credits of CHE 799 in addition to the requirements outlined above. CHE 799 is a seminar course that aims to raise awareness of current, cutting-edge topics in science. CHE 799 is offered every fall and spring semester as a 1 credit course and is graded pass/fail. Requirements for a passing grade must include attendance at three quarters of the official department seminars scheduled during the semester. Additional requirements may apply. *Students who entered the graduate program prior to Fall 2015 are exempt from this requirement.*

Graduate course credits transferred from another institution may not exceed the number of graduate course credits earned at Syracuse University.

### Transition Between M.S. and Ph.D. Programs

M.S. to Ph.D.: A student who enters the graduate program at the M.S. level has the opportunity to transition to the Ph.D. program at the end of their 2nd semester providing she/he has a cumulative GPA of 3.4 or higher and has passed breadth exams in at least 3 of the 4 subject areas. Requests to transition from the M.S. to the Ph.D. program should be made by petition to the chemistry faculty after final grades and breadth exam results are known. If this petition is approved, the student will be considered to have fulfilled all requirements for the first year of the Ph.D. program in good standing.

Ph.D. to M.S.: Any student who fails to satisfy either breadth or GPA requirements for the Ph.D. program at the end of the 2nd semester may request to transition to the M.S. program, provided appropriate degree requirements are met. Such students are not eligible for reentry into the Ph.D. program.

### Selection of Research Advisor

Graduate students pursuing a degree with a thesis are encouraged to choose a research advisor by the end of their first semester in residence, but no later than the end of their first year. Students wishing to receive a graduate degree in chemistry must choose a research advisor with a primary appointment in the Department of Chemistry.

To acquaint new graduate students with the research opportunities available in the Department, a series of research talks is given by the faculty during the first semester of each academic year. All first-year students are required to attend. Students *unable* to attend may be excused by petitioning the Department; if the petition is approved, they are responsible for visiting professors in the Department on their own.

After the faculty seminars are completed, students are encouraged to visit with individual faculty and discuss their intention to join a research group. After making a selection of research advisor(s), each student should complete a form and submit it to the department chairman, who will confer with the designated faculty member(s). If the selection is approved, the chairman will confirm the assignment in writing.

### Committee System

After the student's research advisor has been selected, the Department will appoint a three-member graduate committee. In the event the student has more than one research advisor, a fourth member will be added to the graduate committee; Co-advisors will receive a single vote in committee assessments of student progress.

The main purpose of the committee is to monitor the student's progress, primarily in research, toward the degree. The research advisor will be a member of the committee. The committee chair, who cannot be the research advisor, is responsible for organizing meetings of the committee and for maintaining the flow of information and opinions regarding the student.

The duties of the committee include annual evaluation of student progress, administration of the second year oral examination, and administration of the final oral examination on the thesis. Committee members are expected to remain familiar with the student's research, and to meet frequently, formally or informally, to discuss research progress and other degree requirements.

If a member of the committee feels that insufficient progress is being made, or that the student's performance is below Department standards, the student should be so informed in writing. If no improvement is forthcoming, the committee should meet for discussion of the problem and to make recommendations.



### First Year Report

On the first Tuesday of September of his/her second year, each student will submit a progress report to be evaluated by his/her committee. This report should include a discussion of the background and importance of the project, progress made on the project to date, and avenues that will be pursued in the future. An abstract, a detailed experimental section, and appropriate literature citations should also be included. The experimental section should be developed in close consultation with the student's research advisor. The body of the report should be no longer than 1500 words (double-spaced, 12-point type), excluding abstract, figures, references, experimental details and other supplementary materials. Titles should be included with literature citations.

These reports will be graded pass, pass with reservation, or fail by the student's committee. A pass implies that satisfactory research progress has been made and the report was well-written. A pass with reservation must be upgraded to a pass by rewriting the report to the satisfaction of the student's committee; otherwise the result of the report will be downgraded to Fail. A result of failure implies that unsatisfactory effort has been made. Students who fail the First Year Report must prepare a second report to be given to their committee the second Tuesday of the following January. This second report will be of the same format and graded the same as the first year report, but if a Fail is given the student shall be immediately transferred to the M.S. program.

Students should be notified of their performance by their committee chair in writing within two weeks of handing in the report. Reports not turned in or turned in late, without written excuse of illness or emergency, may be considered the same as a Fail at the discretion of the committee.

### Second-Year Oral Examination and Admission to Candidacy

During the second year, each student will have his/her status reviewed by the graduate committee, which will administer the second-year oral examination. This examination consists of two parts. The first part is an oral defense of the student's research project and an assessment of research progress. This portion of the exam will be based on a written Research

Progress Report submitted by the student. The second part is an oral defense of an original Research Proposal also submitted by the student. The oral examination will be scheduled by the department and will take place during the spring semester. The date of the second-year oral examination will be supplied to the student in writing at least one month prior to the examination. Failure to appear at the scheduled time, without written excuse of illness or other emergency, will result in termination from the Ph.D. program.

Abstracts for both the research progress report and independent proposal must be submitted to the department graduate coordinator for circulation to the entire faculty on March 1st (or the following Monday, if March 1st falls on a weekend).

The Research Progress Report and Research Proposal documents must be submitted to the department graduate coordinator for distribution to the examination committee on the Monday immediately following Spring Break. This requirement applies to all students planning to undergo the candidacy examination, regardless of the date for her/his candidacy examination. Candidacy examinations will be scheduled over a 4 week period beginning the Monday following submission of the Research Progress Report and Research Proposal documents.

Prior to the second-year oral, the committee shall meet without the student present to discuss the student's strengths and deficiencies, overall performance, and prospects that he or she will be a successful candidate for a Ph.D. Earlier meeting of the committee can be called at the request of the student's research advisor.

Following the second-year oral exam, the graduate committee will make a recommendation as to whether the student is qualified to continue toward a Ph.D. degree. The decision will be based on the student's cumulative performance, including breadth examinations, first-year report, coursework, research proposal, research report, and research proficiency. Research proficiency, evaluated at the second-year oral examination includes the student's familiarity with the research literature, understanding of his or her research problem, accomplishments up to the time of the examination, and competency in required research tools, including writing and speaking ability. The committee should be prepared to make a

decision concerning continuation to the Ph.D. degree immediately after the oral examination but, not later than one week after the examination.

If all aspects of the student's performance are found to be satisfactory, and the committee considers the student qualified to continue to the Ph.D., the committee will recommend admission to candidacy ("pass").

In the event the student receives a "pass with reservation", any deficiencies must be resolved before the first day of classes in the fall semester of the same calendar year. This deadline can be set earlier at the discretion of the candidacy examination committee. Failure to address all deficiencies within this timeline will be considered a failure of the original exam.

In the event a student receives a "fail", a second candidacy exam may be scheduled upon approval of the graduate committee. This second exam must be taken by December 1st of the same calendar year. If the student does not pass unconditionally on the second attempt, he/she will be terminated from the Ph.D. program. At this point, a student may transition to the M.S. program.

Any student who fails to receive a passing grade for the candidacy examination by the end of the 5th semester of graduate studies will be terminated from the Ph.D. program.

Once the oral exam has been administered, the chairman of the graduate committee should promptly communicate to the student, in writing, the committee decision together with any recommendation for further remedial work by the student. Copies of all letters to the student should be given to the graduate committee, Department Chair, and graduate coordinator to be included in the student's records.

### *Research Progress Report Requirements*

As noted above, graduate students will be required to submit a formal, written research progress report on his/her research project as part of the second year oral examination. The report should begin with an abstract, not to exceed 250 words, which presents the rationale of the research, its scientific objective, and an estimate of the significance to the field of research if the objective is reached. The body of the narrative may not exceed 1700 words, double-spaced, in at least 12-point type, excluding abstract, figures, references, experimental details

and other supplementary materials. The narrative should expand on the abstract and include background of the project, a description of research progress, its significance, and future goals. Pertinent literature citations, with titles, should be included.

### Research Proposal Requirements

Each doctoral student will be required to submit a formal, written research proposal as part of the second-year oral examination as indicated above. The proposal cannot be in an area directly related to the student's own doctoral research. The topic of the research proposal should be approved by the chair of the student's graduate committee at least one month before the abstract is distributed to the faculty.

The proposal should begin with an abstract, not to exceed 250 words, which presents the rationale of the research, its scientific objective, and an estimate of the significance to the field of research if the objective is reached. The body of the narrative may not exceed 1700 words, double-spaced, in at least 12-point type, excluding abstract, figures, and references. The narrative should expand on the abstract and include a description of the proposed research, its significance, and a general plan of procedure. Pertinent literature citations, with titles, should be included.

### Annual Research Reports

Each student whose degree contains a significant research component will be responsible for keeping his/her graduate committee informed of his/her research progress by providing a yearly progress report. This report should be provided to all members of the chemistry faculty the first Tuesday in April each year until successful completion of the degree.

The annual report will be composed of three parts: a cover page, a current curriculum vitae, and documentation of research progress.

*Cover Page:* The cover page consists of three sections: 1) Research progress over the past year; 2) Research presentations and publications; 3) Proposed research goals for the

upcoming year. An anticipated date of degree completion is also requested. A sample cover page can be found at the end of this document.

*Curriculum Vitae:* The curriculum vitae must include the following information: Education, Honors and Awards, Research Experience, Publications, Research Presentations (talks and posters), and Teaching Experience. Other indicators of professional development should also be included.

*Documentation of Research Progress:* The research progress documentation portion of the annual report will consist of at least one of the following three document types:

- a. Submitted / accepted / in press manuscripts: The student can submit manuscripts as documentation of her/his research progress. Each manuscript must be accompanied by a short statement of work (less than 300 words) explicitly stating the student's individual contribution to that manuscript. If manuscript(s) included do not account for the majority of work completed by the student over the prior year, additional information may be provided in the form of a research progress report.
- b. Research progress report: The student can submit a research progress report describing their research progress over the past year. The report should begin with an abstract, not to exceed one page, which presents the rationale of the research, its scientific objective, and an estimate of the significance to the field of research if the objective is reached. The body of the narrative has no page limit, but must be in 12-point type. The narrative should expand on the abstract and include background of the project, a description of research progress over the past year, its significance, and future goals. Pertinent literature citations and a detailed experimental section should also be included. The experimental section should be developed in close consultation with the student's research advisor.
- c. Thesis outline: If a student expects to defend her/his doctoral thesis before the first day of classes in the following fall semester, he/she can submit a detailed thesis outline to

satisfy the requirement for research progress documentation with the consent his/her research advisor. A student who chooses this option will no longer be eligible for TA support in the following fall semester and beyond.

Within one month of receiving these reports the faculty will meet to discuss the progress of all doctoral candidates. The annual reports will be graded satisfactory or unsatisfactory. Two consecutive unsatisfactory progress reports may result in the transfer of the student to the M.S. program, at the discretion of the faculty. The decision on each report should be communicated to each student in writing within one week of the faculty's decision.

### Publication Requirement

To receive the Ph.D. degree, students are required to publish their research results in peer-reviewed scientific journals. Doctoral candidates may not request a date for their dissertation defense unless the candidate has been listed as an author on at least one peer-reviewed research journal article that is published, in press, or accepted by the editorial staff. The peer-reviewed research article must be related to the student's doctoral studies and the journal must be indexed in Chemical Abstracts, MEDLINE, Web of Knowledge or PubMed. If the candidate is not listed as the first author, the research advisor must furnish a written statement to the doctoral committee explicitly describing and verifying the student's major role in the work. Manuscripts that are "in preparation" or "submitted" do not meet the publication criteria, nor do narrative literature reviews. Book chapters are unacceptable. This publication requirement is a strict condition for graduation and will not be waived.

### M.S. Thesis and Ph.D. Dissertation

When the M.S. thesis or Ph.D. dissertation is complete to the satisfaction of the student's research advisor, and before the final copy is prepared, the thesis must be read by at least one reader other than the research advisor. This reader will usually be that member of the student's committee most qualified by research experience to offer constructive criticism of the thesis contents and presentation. With the approval of the committee, a reader outside the

committee or outside the Department may be chosen if the person is especially qualified in the research area. Ample time (at least two weeks) should be allowed the additional reader(s), who may suggest revision of the manuscript before the final version is printed.

Three weeks before the oral exam, the student should make an appointment to confer with his or her graduate recorder in the Graduate School office to: (1) ensure that the student's file is in order, (2) obtain approval of the thesis or dissertation format, and (3) submit an Appointment of Examining Committee form allowing the Graduate School one week to search for a chair of the oral examination.

The student should keep in mind the Graduate School rules requiring that the thesis, in its final version, be presented to the Graduate School and to the members of the committee administering the thesis defense two weeks in advance of the oral examination. It is the Chemistry Department's intent to adhere strictly to these requirements except in cases of demonstrably extreme hardship. The student has the responsibility of making appropriate arrangements accordingly.

The examining committee for the Ph.D. thesis must have six members, including the committee chair, who must be from outside the Chemistry Department, and the research advisor. Normally, this committee is composed of the three members of the candidate's graduate committee, augmented by two other Chemistry faculty members and the chair. Deviations from this must be approved by the Director of Graduate Studies.

### Seminar

One seminar is required of all Ph.D. and M.S. (thesis option) candidates. The seminar is considered as a report to the Department on the research accomplished by the student. Given near the end of the student's graduate career, the seminar is usually combined with the final (thesis) oral examination.

### Non-Thesis Option for the M.S. Degree

Four areas of concentration will be available: organic chemistry, physical chemistry, inorganic chemistry, and biochemistry. The requirements for the non-thesis option M.S. degree

will be 30 hours of graduate course credits. No more than half of these can be at the 500 level. The emphasis of the degree will be on gaining a comprehensive exposure to graduate chemistry courses. Students will be encouraged to take at least one course in each of the four areas of the department.

In place of the M.S. thesis, a culminating experience will be required. This requirement may consist of a library study of the literature, a comprehensive examination based on the coursework taken by the student, a research paper (e.g. for publication) written by the student, or a seminar presented by the student.

### *Time for Completion of Degree Requirements*

The maximum time for completion of a doctoral degree is five years from the end of the semester in which a student was admitted to candidacy. If a student exceeds the degree completion limit of five years after achieving ABD status, he/she must register for GRD 991, which requires a minimum of one credit hour per semester each fall and spring semester until completion of the doctoral degree. Tuition charges are the responsibility of the student. If a student fails to register for GRD 991, for a given term, he/she will be withdrawn from the graduate program.

Master's degree candidates must complete all requirements for the degree within seven years of their first course registration.

Graduate students who leave the department must complete degree requirements within two years of leaving the department. This includes submission and defense of the thesis or dissertation.

## **MODIFICATIONS**

The faculty of the Department may modify these regulations in such a manner as to meet the needs of the students enrolled in interdisciplinary programs including primary concentrations in Chemistry, or in other unusual situations.



The faculty may also impose additional requirements for any degree under its jurisdiction, if in its judgment it is so warranted.

**ANNUAL PROGRESS REPORT**

Student Name: \_\_\_\_\_ Year in Program: \_\_\_\_\_

**PART I : COVER SHEET** (one page maximum; use 12 point font)

A. List below your primary research accomplishments over the past year:

• \_\_\_\_\_

B. List below research publications and/or meeting presentations over the past year. Include a full citation.

• \_\_\_\_\_

C. List below your specific research goals for the coming year.

• \_\_\_\_\_

D. Anticipated Date of Degree Completion \_\_\_\_\_

**PART II.** Student CV.

**PART III.** Research progress report.

Student Signature: \_\_\_\_\_

Date: \_\_\_\_\_