

## GRADUATE POLICIES

Department of Chemistry  
Oklahoma State University  
May 26, 2010

### I. General

Graduate work in the Department of Chemistry is governed by the rules of the Graduate College. These rules allow Departments to establish policies for graduate work to fit the needs of their students. The purpose of this document is to describe the specific procedures and requirements for graduate work in the Department of Chemistry.

Before entering graduate work, you should become acquainted with these policies, and we urge that you refer to this document as well as the OSU Catalog and the Graduate College web site from time to time as you continue graduate work. While members of the Graduate Faculty will be glad to provide advice, you are responsible for fulfilling the requirements for a degree at the proper time.

The Graduate College web site has forms for the Plan of Study, Admission to Doctoral Candidacy, Final Semester Verification, and Graduate Clearance.

### II. Philosophy of Graduate Work

Graduate work is more than a continuation of undergraduate work. It is an inquiry into the current status of scientific knowledge, and the methods of its acquisition. Successful graduate work should be motivated by scientific curiosity. This will lead to exploration beyond regular assignments, and ultimately result in contributions to scientific knowledge.

The student is expected to attain and demonstrate a general mastery of the basic principles of chemistry, to prove an ability to work independently, to show creativity, initiative and resourcefulness, and to summarize the results of the research in an acceptable M.S. thesis or Ph.D. dissertation.

#### Teaching Experience

It is recommended that each graduate student serve as a teaching assistant for at least 2 semesters while earning either an M.S. or a Ph.D. degree.

### III. General Requirements

The following policies and regulations apply to all graduate students seeking the M.S. or Ph.D. degree in the Department of Chemistry. Although each student is initially accepted into either the Ph.D. or M.S. program, the department understands that desires may change as students become involved in their research programs. If a student in good standing, as described below under Grades, wishes to change from the Ph.D. to the M.S. program or from

the M.S. to Ph.D. program before the completion of his or her degree, a new formal application to the Graduate College is required. With the approval of the student's graduate advisor, the department will accept the application.

### **Advisement**

The Graduate Advisor will serve as your temporary advisor until you select a graduate faculty member to direct your research, at which time an Advisory Committee should be formed to oversee your graduate studies. It is the responsibility of the Advisory Committee to assist you in choosing the proper graduate courses in chemistry and related areas.

### **Grades**

Satisfactory progress towards a graduate degree must be demonstrated. Entering students must take a minimum of six course hours each of the first two semesters. These courses should be approved for a Plan of Study for a M.S. or Ph.D. degree in chemistry or remedial preparation in chemistry, physics, or mathematics for a graduate degree in chemistry. Any reduction of required course hours during the first two semesters must be approved via written appeal to the Department Chair. The records of all students in the Chemistry graduate program will be reviewed at the end of each semester by the faculty Graduate Policies Committee (GPC). Failure to maintain an overall GPA (grade point average) of at least 3.00 in courses approved for graduate credit in the OSU Catalog in the physical, biological, and mathematical sciences will result in academic probation for a period of one semester (excluding Summer). Note that grades in CHEM 5000, CHEM 6000, and CHEM 6010 (research and department seminar) are not counted in the GPA calculated by the GPC. If the student's GPA calculated by the GPC is not at least 3.00 at the end of this probationary period, the student will be dismissed from the Ph.D program and must complete a formal application with the Graduate College to enter the M.S. program. An M.S. candidate must also maintain the minimum grade requirements of the Graduate College. A student who accumulates more than 8 credit hours of uncompensated C, D or F grades, will be dismissed immediately from the graduate program in Chemistry.

### **Chemistry Department Seminar**

Graduate student attendance at Departmental Seminars is considered to be of great educational value, and consequently attendance at these seminars is mandatory. All graduate students are required to enroll in one credit hour of CHEM 6010 (not CHEM 6011, which is the Ph.D. dissertation seminar that you present) in their first semester of residence, and each Fall and Spring semester thereafter. The grade in the course will be based on the student's seminar attendance, and will be assigned at the end of the each semester. A minimum of 75% attendance will earn a grade of A; less than 75% attendance will result in the student earning a grade of F. Excused absences will not be counted.

### **Selection of a Research Advisor**

You should discuss research opportunities with at least four members of the chemistry

faculty. You may present some ideas as to the research problem you wish to pursue, and the faculty will suggest problems of interest to them. Since you will spend much time on the problem you choose for your thesis/dissertation, and your entire career may be influenced by that choice, you should consider the various possibilities carefully and study the relevant literature.

If you start with no deficiencies and are making good progress in courses, you should start research work in the second semester of residence; in any case you are expected to select an advisor by the beginning of your second semester in the program.

At the time you choose a faculty member to serve as your research director and permanent advisor, the joint decision of the student and the advisor must be recorded in the Department office through the completion of a short form (see Appendix) that can be obtained from and returned to the Department Chairman in PS 107. Each research advisor is limited to a maximum of four students who are supported by a teaching assistantship during a given semester. Thus a student cannot join a particular research group if the number of teaching assistants within that group will exceed four at the beginning of the next semester.

### **Thesis/Dissertation**

You and your advisor will plan the research program. In general this will involve a careful search of the literature for all pertinent information followed by consideration of the procedures to be followed. Although these plans will undoubtedly change as the problem unfolds, it is important that you have, from the beginning, a clear concept of the goals to be attained.

Regular written reports of thesis/dissertation research progress serve to review the aims and results of a research program and are required in virtually all professional research. They provide good practice for preparing the thesis/dissertation, which can be more easily organized when based on such reports. Prior to Fall 2008 a grade was given at the end of each semester in which you registered for research (CHEM 5000 or 6000), or the research director may have given the grade of "R" at the end of each semester. Starting with the Fall 2008 semester all grades in CHEM 5000 and CHEM 6000 will be either SR (Satisfactory Research) or UR (Unsatisfactory Research), and all previous "R" grades will be interpreted as "SR" and made permanent.

Your attention is called to the deadlines for submitting the thesis/dissertation before each Commencement. You should plan your research and writing to meet those deadlines. Writing the thesis/dissertation after leaving the campus is wasteful of time and effort and should be avoided. In writing a thesis/dissertation, the first step should be to develop an outline and then prepare a rough draft, which may, with your advisor's approval, be duplicated for use by advisory committee members in the oral examination. The final draft of your thesis/dissertation is prepared after this examination.

The contents of theses/dissertations vary widely, depending on the field of chemistry and the problem. No norm can be specified but you will probably wish to examine earlier theses/dissertations as models. Consult the current Graduate College Thesis Handbook for

specific requirements.

### **Guaranteed Period of TA Appointments for Graduate Assistants in Good Standing**

Graduate students who enter with either a B.S. degree or an M.S. degree from another institution are guaranteed TA appointments for three years of an M.S. program or five years of a Ph.D program. Students who enter the Ph.D. program after earning an M.S. in chemistry at OSU are guaranteed TA appointments for three years. In the case of extenuating circumstances, or if dictated by the instructional needs of the Department, the Department Chair has the prerogative to extend the time limit for an individual student who is making progress towards a degree. Since an advanced degree requires a significant commitment, our guarantee of a teaching assistantship assumes that you are not concurrently enrolled in another degree program and that you continue to devote yourself full-time to your Chemistry graduate degree program.

#### IV. **Master of Science Degree**

All requirements and policies listed in Section III, General Requirements, apply to candidates for the M.S. degree. Other requirements and policies that apply specifically to M.S. degree candidates are as follows:

#### **Required Courses**

Graduate foundation courses are offered in analytical (CHEM 5113), inorganic (CHEM 5260), organic (CHEM 5443) and physical chemistry (CHEM 5563). A student must take physical chemistry (CHEM 5563) and at least two more of the other foundation courses. At the time of entering the graduate program, a student has the option to take proficiency exams in any or all of the foundation courses, which, if passed, exempt the student from taking those foundation courses. Students are expected to complete the foundation courses within the first two years of enrollment in the graduate program.

No graduate credit may be earned for Chemistry courses numbered below 3000. CHEM 5011 (Seminar) and CHEM 5000 (Thesis) are required.

Students in the M.S. program should present the CHEM 5011 seminar on their own research. The oral presentation is required to be 30-40 minutes long and will be followed by questions and discussion.

The M.S. degree requires 30 credit hours, consisting of 24 hours of course work and six hours of research, and a thesis. A student must complete no fewer than 21 semester credit hours of 5000- and 6000-level courses as presented on the Plan of Study. The student must have completed a minimum of 16 semester credit hours in the major department approved in the Plan of Study.

A formal minor in another department is not required; most students in chemistry do not take a minor. However, it is very desirable to include one or more appropriate courses from another department in the Plan of Study.

### **Plan of Study**

Your Graduate Advisory Committee will help you in composing a suitable Plan of Study. Two copies of this plan must be filed in the Office of the Graduate College and one copy in the Chemistry Office before you enroll for the 17th credit hour of graduate level coursework. Major amendment of the Plan of Study must be approved by your advisory committee and the Dean of the Graduate College.

### **Final Oral Examination**

An oral examination over the thesis research is given once the thesis has been written. Any principles related to the thesis and their applications may be included. The examination is conducted by your advisory committee and is open to all interested scholars. An announcement of the time and place of your oral exam should be posted in the Department.

## V. **Doctor of Philosophy Degree**

All requirements and policies listed in Section III, General Requirements, apply to candidates for the Ph.D. degree. Other requirements and policies that apply specifically to Ph.D. degree candidates are as follows:

### **Graduate Advisory Committee**

An advisory committee of five members, of which at least three are from the Chemistry faculty, must be formed before the end of the student's second semester. At least one member must be from outside the Chemistry Department and must be a member of the Graduate Faculty. The committee members will be selected based on their knowledge and expertise in the area of student's thesis research. The Graduate Advisory Committee will (1) advise the student, (2) assist in preparing a Plan of Study, (3) administer the qualifying examination, (4) assist in planning and conducting the research, (5) supervise the writing of and acceptance of the dissertation, and (6) conduct the final examination.

The Graduate College requires a written proposal for doctoral research for admission to doctoral candidacy. In the department of chemistry, this written proposal should be a summary of the Ph.D. research accomplished to date and an outline of the research plan to complete the Ph.D. This document should not exceed two pages. This written document should be distributed to the student's Graduate Advisory Committee before the completion of two years of graduate study. The student and the Graduate Advisory should then meet to discuss the research progress and plan, and, if appropriate, to make mutually agreed upon revisions in the plans.

### **Required Courses**

Graduate foundation courses are offered in analytical (CHEM 5113), inorganic (CHEM 5260), organic (CHEM 5443) and physical chemistry (CHEM 5563). A student must take

physical chemistry (CHEM 5563) and at least two more of the other foundation courses. At the time of entering the graduate program, a student has the option to take proficiency exams in any or all of the foundation courses, which, if passed, exempt the student from taking those foundation courses. Students are expected to complete the foundation courses within the first two years of enrollment in the graduate program.

The specific courses to be included in the Plan of Study will be established by the student's Graduate Advisory Committee. Transfer credit may be established under the rules of the Graduate College and with the approval of the Graduate Advisory Committee. It should be noted that no more than 6 hours of CHEM 5000 (M.S. research credit) is acceptable in a Ph.D. Plan of Study. CHEM 5011 and CHEM 6011 are required, but students entering with an approved M.S. degree are excused from CHEM 5011. It is strongly recommended that CHEM 5011 be taken by the end of the second year.

A student in the Ph.D. program should present the CHEM 5011 seminar on a literature topic different from the student's own research and approved by the student's advisor. The oral presentation is required to be 30-40 minutes long and will be followed by questions and discussion.

CHEM 6011 is run as part of the departmental seminar program. Candidates for the Ph.D. degree should enroll in CHEM 6011 the semester they plan to finish the dissertation. The student is responsible for scheduling the seminar with the faculty member in charge of the departmental seminar. Grades of A or I (incomplete) are to be assigned by the Chairman, and based on the grading of the faculty attending the seminar. A student earning an incomplete must give another presentation in a reasonable time and in accordance with departmental seminar scheduling. You are required to request in writing to your research advisor permission to enroll in CHEM 6011 and get his or her signature before you enroll.

### **Plan of Study**

Your Graduate Advisory Committee will help you in composing a suitable Plan of Study. Two copies of this plan must be filed in the Office of the Graduate College and one copy in the Chemistry Office before you enroll for the 28th credit hour of graduate level coursework. Major amendment of the Plan of Study must be approved by your advisory committee and the Dean of the Graduate College.

### **Qualifying Examination**

Students are required to develop a research proposal in an area outside of the immediate area of the student's graduate research project. If the qualifying examination is not completed by the end of the third year after entry to the Ph.D. program, the student will be placed in the M.S. program. Students who earned an M.S. in Chemistry at OSU must complete the qualifying examination within 12 months after entry to the Ph.D. program. Students are welcome to take the qualifying examination at an earlier time with the approval of the Graduate Advisory Committee. Note that the Graduate College requires a student to take at least 10 hours of CHEM 6000 after formal admission to doctoral candidacy. The examination

consists of three parts:

1) **Pre-Proposal.** The student must submit a pre-proposal for approval by the student's Graduate Advisory Committee (GAC). The pre-proposal will be four to six double spaced pages in length, including literature references, key equations or chemical structures, and other details, for the GAC to make a critical evaluation of the merit of the proposal topic. The pre-proposal should be submitted to the student's GAC and one copy to the faculty Graduate Policies Committee one semester prior to the above deadline. In addition to the pre-proposal, the student must submit at the same time an updated summary of the Ph.D. research accomplished to date and an outline of the research plan to complete the Ph.D. as described above under Graduate Advisory Committee. This document should not exceed two pages.

If the preproposal is approved by the student's GAC, the student will be asked to prepare the Full proposal as described below. If the pre-proposal is not approved by the majority of the GAC, the student will be advised by the GAC either to submit, within one month, a different topic or to revise the current pre-proposal by addressing specific issues indicated by the committee. If rejected, the student will be dismissed from the Ph.D. program and must complete a formal application with the Graduate College to enter the M.S. program.

2) **Full Proposal.** The written form of the full proposal of approximately 15 double-spaced pages will be submitted to the GAC within one month of approval of the preproposal.

The written proposal should clearly describe the intended research and establish both the feasibility of the proposed methods of study, the significance of the anticipated results, and a scheme for evaluation of the results. The proposed research must be original and substantive. The proposal must be sufficiently detailed, with literature references, structures, figures, and other relevant information, that the proposed study can be evaluated on the basis of the written proposal. It is important that the proposed work be placed in context with a thorough literature review.

If the written proposal is approved by the GAC, the student can schedule a time for the oral exam, which must be arranged before the end of the third year.

If the proposal is not accepted, the GAC will provide the student with a list of queries and comments regarding the various aspects of the proposal. The student must carefully implement the recommendations made by the GAC and provide a revised proposal that addresses the criticisms of the GAC. The revised proposal must be submitted within one month from the time of notification. If the revision is acceptable to the GAC, the student will schedule the oral exam. If rejected, the student will be dismissed from the Ph.D program and must complete a formal application with the Graduate College to enter the M.S. program.

3) **Oral Examination:** The oral examination will be decided on a pass/fail basis. In preparation for this defense: The student must (i) have a grasp of all concepts and principles used in developing the proposal, and (ii) clearly explain the function or the implication of

each approach in the proposal. The student will be asked questions on any subject related to chemistry that may originate from the various concepts, background and experimental design of the proposal. In addition, the student must be prepared to answer questions derived from his/her overall graduate and undergraduate training. The oral exam will be conducted by the GAC, which may invite up to three additional faculty members to participate in the examination.

A student who fails the oral exam will be allowed a second defense after a period of two weeks. A student who fails the second attempt will be dismissed from the Ph.D program and must complete a formal application with the Graduate College to enter the M.S. program. A copy of the results of the qualifying examination must be provided to the Graduate Policies Committee.

### **Research and Dissertation**

A large portion of your work for the degree will be devoted to research. As a result of your research, some worthwhile contribution toward the understanding of chemistry is required. Most of the responsibility for the thesis rests upon you. Although your advisor will help whenever possible with suggestions, you must assume the initiative in conducting the work and bringing it to a successful conclusion. The Ph.D. degree should be held by persons who are not only capable of, but also aggressive in, independent investigation. This is one of the principal criteria that the Graduate Faculty will use in evaluating candidates for the degree. Since the results of scientific investigation are of very limited value unless published, it is expected that work described in the dissertation will be publishable in internationally recognized, refereed journals.

### **Guidelines for Completion of the Dissertation and Earning the Ph.D.**

A successful Ph.D. dissertation typically is written when the research has produced papers accepted or submitted for publication in peer-reviewed journals.

Graduation Clearance Form. Students wishing to graduate must submit a graduation clearance form, signed by their advisor, in their last semester. This form guides students through the process of verifying that degree requirements will be met. An extremely important step in this process is checking that courses listed on the Plan of Study have been taken and that the course prefix and number match those on the transcript exactly. The deadline for completion of this form is published each semester in the academic calendar. This form must be received by the Graduate College before a student can submit a diploma application with the Registrar's Office.

A final, accurate and approved Plan of Study must be filed at the Graduate College before the end of the second week of the semester in which the degree is to be conferred. The courses and grades on the Plan of Study must meet all of the requirements for the Ph.D. of both the Graduate College and the Department of Chemistry. Normally the only courses listed on the Plan of Study for the final semester are the Ph.D. seminar, Chemistry 6011, and research, Chemistry 6000.

## **Final Examination**

After the dissertation has been completed and a draft copy approved, you will request permission from the Dean of the Graduate College to arrange for your Final Examination. This examination will be oral and will deal mainly with the subject matter of your thesis; however, you may well be questioned on general principles which are related to the work of your dissertation as well as on any material which your Committee feels you should know. Since it is open to all interested scholars, the time and place should be posted in the Department.

## **Entry to the Ph.D. Program after Completion of the M.S. in Chemistry at OSU**

After completion of the M.S. degree, a student may apply for admission to the Ph.D. program by completing the departmental and Graduate College application forms. The Departmental decision on the request will be made after formal completion of the M.S. requirements. The departmental requirements for admission to the Ph.D. program after completion of the M.S. at Oklahoma State University are:

1. The student's GPA, exclusive of research, must be at least 3.00 in courses in the mathematical, biological, and physical sciences (as cited on page 2, Grades).
2. A letter of recommendation from the student's M.S. advisor and at least one other chemistry faculty member.
3. At least one faculty member must agree to serve as the student's Ph.D. advisor.
4. The department faculty and the department Chair must approve admission.

## **Core Courses**

Students are required to take at least 12 hours of the following courses. The selected core courses should be included in the student's plan of study. Similar courses offered by other departments may be substituted upon approval by the student's Graduate Advisory Committee if it is not feasible to take the courses specified in the plan of study within a reasonable time. A student wishing to specialize in analytical, inorganic, organic, or physical chemistry should take at least 9 hours of the core courses in that area. Students wishing to pursue a plan of study that combines one or more of these traditional disciplines can select core courses from the appropriate areas.

CHEM 5103 Physical and Chemical Separations  
CHEM 6103 Electroanalytical Chemistry  
CHEM 6113 Analytical Spectroscopy  
CHEM 6050 Special Topics in Analytical Chemistry  
CHEM 5960 Inorganic Chemistry II  
CHEM 5283 Solid State Chemistry  
CHEM 5323 Reactions of Organic Compounds  
CHEM 5373 Spectrometric Identification of Organic Compounds  
CHEM 6420 Special Topics in Organic Chemistry  
CHEM 6623 Chemical Thermodynamics II  
CHEM 5623 Quantum Chemistry I

CHEM 6523 Quantum Chemistry II  
CHEM 6453 Chemical Kinetics  
CHEM 6553 Molecular Spectroscopy  
CHEM 6650 Selected Topics in Advanced Physical and Inorganic Chemistry

## VI. **Appeal Rights and Procedures**

Course grade appeals are handled by the university Grade Appeals Board. Appeal forms are available in the Office of Academic Affairs. Research grades, qualifying examination, and the final oral examination may be appealed through the Graduate College. See the Graduate College policy titled "Resolution/Appeals of Graduate Issues Not Related to Grades or Violations of Academic Integrity."

A ruling based on these policies of the Department of Chemistry also may be appealed by a student. A written appeal must be made in a timely manner to the Department Chair, who will seek advice of the GPC and the Department faculty.

Appeals based on the following will not be considered:

1. Requests to be given a second probationary semester to raise the GPA to 3.00 in order to bypass the Master's program or, for students beyond the first year, to remain in the Ph.D. program.
2. Requests for special consideration because the M.S. has already been earned, either here or at another qualified university.
3. Appeals based on language problems.
4. Appeals based on some special dispensation made in the past to other students.

## STUDENTS PICKING ADVISOR

In the best interest of both students and faculty, students intending to earn an advanced degree should visit with at least four graduate faculty to discuss potential research problems before choosing an advisor.

NAME	DATE	NAME	DATE
A. Apblett _____		B. Lavine _____	
K. Ausman _____		N. Materer _____	
S. Benson _____		N. Purdie _____	
K.D. Berlin _____		L. M. Raff _____	
F.D. Blum _____		M. Rockley _____	
R.A. Bunce _____		L. Shirtcliff _____	
Z. El Rassi _____		L. Slaughter _____	
J. I. Gelder _____		S. Weinert _____	
		J. White _____	

_____ Name of Advisor Chosen	_____ Date	_____ Student Signature	_____ Date
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After you have met with and obtained signatures from four of the above faculty members, fill out the APPENDIX (copy attached), sign and date the form, get the signature of the research advisor you have selected, and return both forms to the Chemistry Department office in Room 107. This should be accomplished before April 1.

After the Department Chair has signed the form, a copy will be retained in your file, a copy will be sent to your Advisor, and the original will be returned to you. Later, when you have selected your Graduate Advisory Committee, return the form to the Chemistry Department office to retain in your file.

This form must be completed and sent to the Chemistry Department Chair no later than the beginning of the student's second semester.

APPENDIX

**CHOICE OF A MAJOR ADVISOR AND ADVISORY COMMITTEE  
FOR THESIS RESEARCH**

I have decided to pursue my (M.S./Ph.D.) thesis research with the guidance of

\_\_\_\_\_ as my major advisor.

This decision is agreeable to me and the professor.

\_\_\_\_\_  
Student

\_\_\_\_\_  
Date

\_\_\_\_\_  
Advisor

\_\_\_\_\_  
Date

\_\_\_\_\_  
Department Chair

\_\_\_\_\_  
Date

GRADUATE ADVISORY COMMITTEE:

Chemistry faculty members:

\_\_\_\_\_ (Chair)

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Outside member(s):

\_\_\_\_\_

\_\_\_\_\_

This form must be completed and sent to the Chemistry Department Chair no later than the end of the student's second semester.