



**A STATEMENT OF**

**GRADUATE PROGRAM REQUIREMENTS, POLICIES AND PROCEDURES**

**OF THE**

**DEPARTMENT OF CHEMISTRY AND BIOCHEMISTRY**

**AT**

**THE UNIVERSITY OF SOUTHERN MISSISSIPPI**

**January, 2012**

This document has been carefully checked for consistency with USM academic policies as stated in the 2011-2012 Graduate Bulletin. In the event of any inconsistency, the policies stated in the Graduate Bulletin or those approved by the Graduate Council and the University must take precedence.

GRADUATE POLICIES AND PROCEDURES  
DEPARTMENT OF CHEMISTRY AND BIOCHEMISTRY  
(2011)

I. PHILOSOPHY OF GRADUATE PROGRAM

Recognizing that specialization is inevitable in chemistry and biochemistry beyond the undergraduate level, our primary objective is to help our students become professionals within their own special areas of interest. Our students should, however, be exposed to as broad a range of contemporary chemistry and/or biochemistry as is consistent with the achievement of this primary objective.

II. ADMISSION POLICY FOR INCOMING GRADUATE STUDENTS

The requirements of the Graduate School for applicants wishing to enter our graduate program will be used by the department. In addition, students whose native language is not English must achieve a score of 590 or above (243 or above computer scored) in the Test of English as a Foreign Language (TOEFL) exam.

The Graduate Admissions Committee, consisting of representatives from at least three of the areas of chemistry, recommends students to the Chair of the department for admission to the graduate program and University assistantship support.

III. UNDERGRADUATE BACKGROUNDS OF GRADUATE STUDENTS

Since not all entering students will have undergraduate degrees in chemistry or biochemistry, all M.S. and Ph.D. graduates of the department must have completed undergraduate chemistry or biochemistry coursework at an equivalent or higher level to that contained in one of the B.S. degree programs of the department. A grade of C or above must have been obtained in all chemistry or biochemistry courses.

Irrespective of grades in previous undergraduate courses, all entering students will take placement exams in the areas of biochemistry, analytical, organic, inorganic and physical chemistry. The results will be used for advisement purposes and may also count towards qualification for the Ph.D. degrees (*cf* section V).

IV. THE GRADUATE COORDINATOR

The graduate coordinator will advise incoming students in consultation with the chair and other faculty, assist all graduate students in understanding department and university academic regulations (including this document), ensure that students comply with these regulations, and act as an advocate for graduate students in their interactions with the Department and University.

## V. PLACEMENT AND QUALIFYING EXAMINATIONS

All graduate students will sit for a series of standardized exams that are appropriate to measure mastery of the undergraduate material in the five subdivisions biochemistry, analytical, inorganic, organic and physical chemistry. These placement exams assess the students' strengths and weaknesses in these areas of chemistry and guide the graduate coordinator, their advisors and committees in suggesting appropriate academic coursework.

The full set of exams is administered each year during registration week in the fall and immediately after the end of term in the spring. All incoming graduate students holding a B.S. or an equivalent degree will sit for the exams for placement purposes at the earliest opportunity after being formally admitted to the graduate program in chemistry. A student entering in the fall will take the exams immediately upon arrival; students admitted for the spring semester will take the exams after the end of their first term. Students holding an M.S. degree in the chemical sciences upon entering the graduate program will not take placement exams.

Standardized exams in biochemistry, analytical, inorganic, organic and physical chemistry will serve as qualifying exams for the Ph.D. degree track. All students must take the qualifying exams at the earliest opportunity after entering the program. Satisfactory scores on individual placement exams given upon matriculation may be used in lieu of qualifying exams.

To qualify for the Ph.D. degree track a student must score 150 percentile points (out of 300) on his/her highest three area exams. Biochemistry students can also qualify for the Ph.D. program by scoring at least 85 percentile points on the biochemistry exam. Percentile points are based on the American Chemical Society national norms.

All students may sit for the qualifying exams **twice only**. An area exam may be repeated, and the highest area exam score will be used in calculation of points. A student who scores less than 150 percentile points after taking the qualifying exams twice has not qualified for the Ph.D. program but may proceed toward the M.S. degree and, upon completion of this degree, may petition the graduate admissions committee for permission to retake the Ph.D. qualifying exam.

No qualifying exams are required for graduate students who hold a B.S. or an equivalent degree and were admitted for the M.S. degree track.

## VI. THE GRADUATE STUDENT-MAJOR PROFESSOR RELATIONSHIP

All incoming students must select their major professor by the end of their first semester in residence according to the following method: At the beginning of the first semester for new students, the Graduate Coordinator may schedule a series of faculty presentations or refer the students to the faculty web pages. Students will then talk to their prospective professors to arrange at least two research lab rotations of 4-5 week duration each. Without delay, students

will start their rotations. After the completion of their first rotation, students will immediately initiate their second rotation. The student will prepare a report on the research done during each rotation within one week of completing a rotation, and have the faculty member sign the report (original to Department Chair, copy to graduate coordinator). The student will develop an order of preference for an advisor after completing all rotations, and return to the preferred faculty member to come to a mutual agreement to collaborate on a graduate research project. After this agreement is reached, both the student and the faculty member sign the appropriate form. The student gives a copy to the graduate coordinator and returns the original to the Chair, who notifies the entire faculty in writing of the arrangement.

The relationship between student and major professor starts when the graduate student and one member of the Department's graduate faculty agree to work together on a research project. The agreement between graduate student and advisor is formal and binding and is retained until the graduate student completes his/her research, or until the graduate faculty member or the graduate student terminates the agreement after a **one-semester trial period**. A student may be asked to leave an advisor's research group because of unsatisfactory performance at any time after the initial trial semester (*cf* section XI). After leaving an advisor's laboratory, a student may choose an alternative advisor **only once** before being dismissed from the program.

## VII. THE ADVISORY COMMITTEE

The student's committee is responsible for ensuring that the student is in compliance with the academic regulations of the Department and University. Committees must meet at least once a year. It is the student's responsibility to arrange these meetings, which normally follow the student's annual research presentation (*cf* section IX). The Chair of the advisory committee will prepare a **written report** that summarizes the committee's deliberations and conclusions about the student's research progress. The report must be approved by the committee and must be given to the Graduate Coordinator and the Chair of the Department within a week after the meeting.

### A. The Master's Committee

After consultation with the M.S. candidate and his/her major professor, the Chair will recommend the appointment of a Master's Committee, with at least three members, the majority of whom are graduate faculty of the Department of Chemistry and Biochemistry, to the Dean of the Graduate School. The committee, chaired by the student's major professor, will be appointed by the Dean of the Graduate School.

Responsibilities of the Master's Committee will include:

- (1) continual advisement of the student regarding research,
- (2) continual advisement of the student regarding curriculum matters,
- (3) evaluation (pass or fail) of the student's thesis and oral thesis defense/comprehensive examination.

B. The Doctoral Committee

After consultation with the Ph.D. candidate and his or her major professor, the Chair will recommend the appointment of a Doctoral Committee, consisting of five members, of whom one can be graduate faculty outside the Department of Chemistry and Biochemistry, to the Dean of the Graduate School. The committee, chaired by the student's major professor, will be appointed by the Dean of the Graduate School.

Responsibilities of the Doctoral Committee will include:

- (1) continual advisement of the candidate regarding research and curricula, and in meeting the research tools requirement
- (2) setting and grading of the written comprehensive examination,
- (3) evaluation (pass or fail) of the candidate's Research Prospectus,
- (4) evaluation (pass or fail) of the candidate's dissertation and dissertation defense.

VIII. THE RESEARCH PROSPECTUS

All doctoral students must complete and defend a Research Prospectus, the student's plan for his or her dissertation research. The Research Prospectus must be written and defended no later than two years after the student enters the graduate program. The prospectus will consist of two parts, one written, the other oral. Two weeks before the scheduled oral presentation date, the final draft of the written part is submitted to the student's doctoral advisory committee for an evaluation. This evaluation terminates in an oral presentation and defense of the prospectus before the whole department. The prospectus must include the hypothesis(es) to be pursued and a description of the proposed research and its significance; it must incorporate a comprehensive survey of the literature relevant to the proposed research, and a discussion of the methods to be used in the proposed research. It is recognized that research is often unpredictable and what seems to be a reasonable project sometimes cannot be completed. Therefore, the prospectus does not irreversibly bind the student to a specific project. The student and his or her advisory committee will ultimately decide on the specific details of the work to be reported in the dissertation.

## IX. ANNUAL RESEARCH PRESENTATIONS

After their first year, all students must make a formal presentation on their research progress (at least 45 min long) to the department each year. The research prospectus (*cf* section VIII) and dissertation defense (*cf* section XIII) fulfill this requirement for those years. The presentation date must be scheduled with the graduate coordinator during the previous semester.

## X. COMPREHENSIVE EXAMINATIONS

### The M.S. Comprehensive Examination

The oral defense of the M.S. thesis will serve as the M.S. comprehensive exam.

### Ph.D. Comprehensive Examination

Candidates for the Ph.D. degree (i.e., either holding or bypassing the M.S. degree) must sit for the Ph.D. Comprehensive Examination during the fall semester of the fourth year in residence. Each year, the written portion of the comprehensive exam will be administered during one week in October. Each of the student's committee members submits one or a few questions that the student will answer without access to any outside resources, such as text- or reference books. The student will be given and will answer at least one committee member's question(s) per day during the exam week.

Within a month following the written exam, an oral follow-up exam will be scheduled by the student at the committee's convenience. The written exam questions will have been graded by the time the oral exam is administered. The student will be informed of the outcome of the written and oral portion of the comprehensive exam within a week after the oral exam.

Should the student not pass the exam at the first attempt, the comprehensive exam may be retaken once if the committee approves and after a period of at least two months of intense study has occurred.

Students, upon consultation with their research advisor, may opt to write and defend an original proposal (OP) in lieu of the standard Comprehensive Examination format as described above. Please see section XV of this document for the rules regarding writing and defending an OP.

## XI. SATISFACTORY PERFORMANCE

Each student is expected to maintain a minimum lecture and lab coursework (i.e. non-research hours) GPA of 3.0 (B), to perform teaching duties in a satisfactory manner, and to aggressively pursue a research problem on a twelve-month basis. Failure to maintain a satisfactory level of performance will result in termination of support.

The advisor will provide the student joining his/her laboratory with a set of written rules,

goals and expectations and will notify the student in writing if his/her performance is considered unsatisfactory (e.g. because of lack of research productivity, poor laboratory citizenship and undergraduate mentoring, etc.) and will give the student a set time to remedy the situation. If an advisor insists on dismissing a graduate student from his/her laboratory after the agreed time period, the student has **one other opportunity** to choose and work with an alternative advisor before being dismissed from the program (*cf* section VI).

#### Departmental Academic Probation

A student who does not complete the prospectus or comprehensive exam within the required period will be placed on departmental academic probation. If the student fails to complete the requirement in the following semester, he or she will be dismissed from the program, irrespective of his or her funding source. Students whose GPA in lecture and laboratory courses drops below 3.0 will have one academic year to raise their GPA. Failing this, they will be dismissed from the program, irrespective of funding source.

#### Academic Honesty and Plagiarism

The University policy on academic honesty and plagiarism applies. Depending on the severity of the offense, the student may face a failing grade in the course or assignment in question, probation, suspension and/or expulsion from the program and the university (see Graduate Bulletin). As part of the departmental orientation session, graduate students entering the program will be informed about these policies. Students are required to take the plagiarism pretest, complete the tutorial and take the posttest offered by the USM libraries online (<http://www.lib.usm.edu/research/plag/plagiarismtutorial.php>).

## XII. REQUIREMENTS FOR THE M.S. DEGREE:

- (1) Completion of undergraduate chemistry and/or biochemistry coursework equivalent to that contained in one of the B.S. degree programs of the Department of Chemistry and Biochemistry.
- (2) Enrollment and participation in the seminar program (CHE 689) during each semester of residence.
- (3) Completion of coursework requirements determined in consultation with the advisory committee. A minimum cumulative GPA of 3.00 (on a 4.00 = A scale; note that a grade of B- counts less than 3.00!) is required. Students must earn a grade of B or better in at least two 3-credit-hour graduate lecture courses at the 600 or above level. Of these courses, at least one must have the CHE prefix. The other must have a CHE, BSC, PHY, PSC, or MAT prefix.
- (4) Completion of departmental research tools requirements, which are PHI 735 (Research Ethics and Tools), CHE 510 (Lab Safety), and CHE 500 (Chemical Literature).
- (5) Completion of a suitable research project followed by successful oral defense of a

written thesis. The final draft of the written thesis must be submitted to the student's advisory committee for evaluation at least two weeks before the scheduled oral presentation date. The oral defense constitutes the comprehensive exam for the M.S. degree. Six hours of credit (CHE 698) are given for the thesis.

- (6) Accumulation of at least thirty hours at the level of 500 and above beyond the Bachelor's degree (research, thesis and seminar hours included). This is an Office of Graduate Studies requirement.
- (7) Completion of additional Office of Graduate Studies requirements from the bulletin that is in force the semester the student entered the program or any semester during the student's residence.

### XIII. REQUIREMENTS FOR THE PH.D. DEGREE:

- (1) Completion of chemistry and/or biochemistry undergraduate coursework equivalent to that contained in one of the B.S. degree programs of the Department of Chemistry and Biochemistry.
- (2) Successful completion of the Ph.D. qualifying exam.
- (3) Successful oral defense of a written research prospectus.
- (4) Enrollment and participation in the seminar program (CHE 789) during each semester of residence.
- (5) Teaching the equivalent of 6 freshman chemistry laboratories. Students must concurrently enroll in CHE 509 (Chemistry Laboratory Teaching) the first semester of their TA assignment and earn a B or better grade in order to continue as TA.
- (6) Completion of coursework requirements determined in consultation with the advisory committee. A minimum GPA of 3.00 is required at the time of graduation. Students must earn a grade of B or better in at least three 3-credit-hour graduate lecture courses at the 600 or above level. Of these courses, at least two must have the CHE prefix. The other must have a CHE, BSC, PHY, PSC, or MAT prefix.
- (7) Completion of departmental research tools requirements, which are PHI 735 (Research Ethics and Tools), CHE 500 (Chemical Literature) and CHE 510 (Laboratory Safety).
- (8) Successful completion of the written and oral comprehensive examination.
- (9) Completion of a substantial research project and successful oral defense of a written dissertation. The final draft of the written dissertation must be submitted to the student's advisory committee for evaluation at least two weeks before the scheduled



oral presentation date. Twelve hours credit is granted for the dissertation (CHE 898) on a pass/fail basis.

- (10) The accumulation of 84 hours above the Bachelor's Degree or 54 hours above the Master's Degree (including research, dissertation, thesis and seminar hours). This is an Office of Graduate Studies requirement.
- (11) Completion of additional Office of Graduate Studies requirements from the bulletin that is in force the semester the student entered the program or any semester during the student's residence.

#### XIV. TEACHING ASSISTANTSHIPS

Teaching assistantships are awarded by the Chair upon the recommendation of the Graduate Admissions Committee. Students must concurrently enroll in CHE 509 (Chemistry Laboratory Teaching) during their first semester of their TA assignment. Students must earn a grade of B or better in order to continue receiving a teaching assistantship. Students who fail to earn a grade of B or better must retake the course. Students who retake and earn a B or better may then receive a teaching assistantship. Since all doctoral students must have some teaching experience (*cf* section XIII) before receiving the Ph.D., all such students must also eventually meet the teaching proficiency and CHE 509 requirements.

Continuation of departmental teaching assistantships beyond the first year is contingent upon the student's successful completion of the Ph.D. qualifying exams by the end of his or her first year, meeting of all other requirements, and continued progress towards a Ph.D. degree (*cf* section XIII).

The department will grant no more than one year of full time support for students in the M.S. program or three years in the Ph.D program, via departmental assistantships or departmental fellowships.

#### XII. RESEARCH ASSISTANTSHIPS

Research assistantships are awarded at the discretion of the budgetary authority, the faculty member receiving a grant. A student who has entered the department and accepted a teaching assistantship may, at the discretion of the Chair, be required to hold the position and teach for the department an entire year.

#### XIII. OUTSIDE WORK BY GRADUATE STUDENTS

Students receiving full-time support through teaching or research assistantships or special fellowships **may not engage in any outside employment**. Additional paid employment within the University is governed by the appropriate University regulations. The permission of the student's major professor and the Chair must be obtained before even this type of extra employment commences.

#### XIV. VACATION AND MATERNITY LEAVE

Graduate students are full-time teaching/research assistants for a twelve-month period. That means they are entitled to vacation time equivalent to the USM winter break (~ 10 days) plus two additional weeks during the calendar year. **Spring and fall breaks are breaks from the lecture schedule only and should not be viewed as additional vacation time. Graduate students do not have inter-semester breaks that are normally enjoyed by undergraduate students.** Teaching assistants must schedule any recreational trips so that they do not interfere with USM's teaching schedule. All graduate students are expected to discuss their vacation plans with their advisor well in advance and seek his/her approval before making travel arrangements.

All graduate students are expected to adhere to the common laboratory safety procedures that are discussed in CHE 510. While every effort is made to provide a safe laboratory environment, all biological effects of all reagents and procedures used are not currently known. Therefore, if a student is pregnant or considering becoming pregnant during her time as a graduate student in the Department of Chemistry and Biochemistry, we strongly suggest that she consult her physician as soon as possible about the wisdom of continuing her research during her pregnancy.

Graduate students are not full-time university employees and are not eligible for benefits such as paid leave under the national Family Medical Leave Act (FMLA). Students who give birth while being paid on a graduate or teaching assistantship are allowed a one-month paid maternity leave.

According to University policy, it is the responsibility of the graduate student to make arrangements for the care of his/her children during working hours. For safety reasons, a graduate student is not allowed to care for his/her children in the workplace.

#### XV. ORIGINAL PROPOSAL (OP)

Graduate students at USM are required to complete a Comprehensive Examination in order to graduate. The Department of Chemistry and Biochemistry allows the development of an original proposal (OP) to count as an alternative to the standard exam format for Ph.D. candidates. Proposal writing is an essential skill of all professional scientists and proposals come in many forms. We require that the NSF format be used for the OP.

1. A student wishing to write and defend an OP in lieu of the traditional Comprehensive Examination must first discuss this with their research advisor and obtain approval from their advisor. The student will then complete the Declaration to Defend an Original Proposal form and provide a copy to the Graduate Coordinator.

2. The original proposal must not be a derivative of the student's Ph.D. work. The idea for the proposal must not be related to any of the hypotheses/ideas being explored in the student's Ph.D. work.

3. The student must present to their committee an idea for an OP during the month of June. The student will present each committee member with a one page abstract outlining the original proposal topic. The abstract must outline the general idea/hypothesis, its importance, and a brief description of the methods proposed to test the hypothesis/idea. The abstract should include a couple of key references. The student is highly encouraged to seek advice from the research mentor regarding appropriateness of the proposal topic prior to submitting the abstract to the committee.

4. The committee will either approve or reject the topic as outlined in the abstract. Each committee member will provide to the student, in writing, their acceptance or rejection of the topic. A topic is considered rejected by the committee when a majority of committee members inform the student of rejection. Topics may be rejected by the committee due to the lack of sound scientific principles, lack of originality, lack or absence of testable hypotheses, etc. The student will be given an additional month to prepare an alternate topic should the committee reject the original OP topic.

5. The student will compose a proposal using the NSF format. The student will compose the proposal according to the most recent Grant Proposal Guide (GPG) that can be found at [http://www.nsf.gov/publications/pub\\_summ.jsp?ods\\_key=gpg](http://www.nsf.gov/publications/pub_summ.jsp?ods_key=gpg). Students must adhere to page length, font, line spacing, and margin requirements as outlined in the GPG. The student need not provide any supplemental information, a biographical sketch, or a budget as directed for typical NSF proposals. Students will address the intellectual merit and scientific broader impacts criteria. Students need not address societal or educational broader impacts.

6. The student will arrange a date for the OP defense that is convenient to the committee. However, the proposal must be defended prior to the end of the fall semester in the year comprehensive examinations are to be completed. Proposal defenses are not public or part of the Thursday seminar series. It is the student's responsibility to arrange the date, time, and location of the defense.

7. The student will provide a copy of the proposal to each committee member two weeks before the scheduled defense date.

8. The student will prepare a 30-45 minute presentation to present at the defense. At the end of the presentation the student will undergo an oral examination of both the written proposal and the presentation.

9. The student will be evaluated based on the NSF review criteria and the student's ability to defend the proposed research by each of the committee members. The NSF review criteria include intellectual merit and scientific broader impacts. The NSF review criteria are described in the GPG. Each committee member will assign the proposal to one of the

following categories: Transformative (3), Highly Meritorious (2), Meritorious (1), or Uncompetitive (0). The average committee score must be a 1 or higher level to receive a passing grade on the comprehensive examination.

10. A student who fails the OP defense will be given an additional two months to address the shortcomings of the proposal and complete the defense. The student will receive, immediately after the defense, from the committee, in writing, the concerns and issues which led to the failing grade. The student will then address each of the issues and concerns in writing and provide this to each committee member. The student will then schedule an additional committee meeting where the student will address each issue before the committee. The committee will then determine if the student has adequately addressed all of the concerns and determine if the student has passed or failed.