CHEMISTRY, PH.D.

The Department of Chemistry and Biochemistry offers a research-intensive PhD program resulting in the production of a significant body of original work. Typically completion of the PhD program takes 4-5 years, the bulk of which is spent working on research projects. Additional focus will be on coursework and professional development, including the development of written and oral communication skills.

Admissions
In addition to meeting the general requirements of the Graduate School, entering graduate students should have completed undergraduate coursework equivalent to a BS degree in chemistry or biochemistry.

See the Admission Criteria section of this catalog for more information.

Curricular Requirements

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Footnotes

1 Students should complete 18 credits of lecture courses in the first two years. CH 519/CH 520 should be taken during the first semester as core courses. The remaining 12 hours should be selected in consultation with their research advisor.
2 CH 584 Chem Lit & Comm is taken in the Fall of the second year.
3 Student registration in CH 585 Chemistry Seminars is required every semester unless there is a TA assignment conflict. 6 credit hours is the minimum required, but most student will take 8 or more hours (see Additional Academic Requirements).
4 Registration for CH 586 Research Seminar will occur in your final semester.
5 Students should register for 1 hr of CH 570 in the Fall of their first year. The remaining 15-17 credits should be CH 660 Adv Research Techniques Chem. The full 16-18 credits should be completed by the end of the third year.
6 Student should register for CH 680 in the Spring of their second year and CH 681 in the Spring of their third year.
7 Students can begin registration for CH 699 in the semester following successful completion of CH 681 and Graduate School-approved PhD Candidacy. Once enrolled, CH 699 must be taken every semester through degree completion.

Transfer Credit

Students who have already passed equivalent courses may request to transfer up to four lecture courses (maximum of 12 credits). Transfer credit for more than two lecture courses requires approval from the Department Graduate Committee. Transfer credits will not be awarded for research, seminar, or oral/written candidacy courses. Also see Graduate School information on Transfer Credit.

Doctoral Plan of Study Requirement

All doctoral students must have a completed Plan of Study approved by the Graduate School no later than the semester during which the student will complete 30 semester hours of UA and/or transfer credit for the doctoral degree. Otherwise, a “hold” may be placed on future registrations.

Admission to Candidacy Requirements

Candidacy to the Ph.D. program occurs when a student has completed the following: 1) received an approved Plan of Study, 2) completed all formal coursework, 3) passed written and oral candidacy exams, and 4) filed for Admission to PhD Candidacy. In general, all these requirements are completed by the end of the student’s sixth semester in the program.
The written critical review of a pre-approved scientific publication in CH 584 Chem Lit & Comm serves as the written candidacy exam. The student’s committee will evaluate the written document near the end of the Fall semester and provide a list of required document revisions by the Monday of Finals Week. The revised document must be submitted to the committee for final evaluation by the Monday immediately following Finals Week. The revised document must be deemed satisfactory by a majority of the committee members to pass the written cumulative exam requirement. **Failure to pass this requirement will result in dismissal from the Ph.D. program.** The Graduate Committee will determine, with input from the dissertation committee, whether relegation to the Master’s program is appropriate.

After completion of the written candidacy exam (see above), students must complete the oral candidacy exam (OCE). Students will present a detailed research summary and an original research proposal. Each of these parts will be supported by a written document delivered to every committee member at least one week prior to the exam. In connection with this exam, students must register for CH 681 Oral Candidacy Exam.

**OCE Research Presentation:**
Students should prepare an oral presentation (supported with computer graphics) of results and prospects to be presented to the dissertation committee during the exam. Slides should be clear and properly referenced. The research presentation will include: A) a summary of progress (grades, comprehensive written exam, manuscripts, awards); B) a discussion of the background and significance of the research project; C) a description of the work completed to date; and D) a description of plans for completing research for a dissertation.

Students should demonstrate command of their project’s background and goals. The motivation behind the project should be described. Additionally, students should begin to demonstrate the ability to critically evaluate their own results as well as make predictions regarding the outcomes of future work.

The research presentation will be supported by a written report composed of a minimum of 3000 words excluding figures, tables, and the bibliography. The word count must be added to the end of the document. All information from sources other than the student (including other group members, UA personnel, and external resources) should be properly attributed. A list of consistently formatted references should be appended to the end of the report and will not contribute to the word count.

**OCE Original Research Proposal:**
The remainder of the exam will involve the defense of an original research proposal. The proposal can be related to the student’s research but cannot involve an extant part of the advisor’s research program. Alternatively, the student can propose a line of inquiry remote from their own projects. In either case, the topic must be endorsed by the advisor as being neither a current direction within their group nor a project idea formulated by the advisor. The advisor may not be involved in proposed project design, proposal editing, or presentation preparation. Failure to abide by this policy, as judged by the approved committee, may result in either an “incomplete” or “fail” grade (see below) at the discretion of the committee. Students are permitted to consult any resources other than their advisor/Committee Chair in preparing the defense of their Original Research Proposal, including non-Chair committee members. A proposal abstract must be approved by the advisor and then by the committee at least 8 weeks in advance of the examination. The student will be evaluated on the identification of a significant research question, the development of hypotheses, and the proposal of specific experiments to test these hypotheses. The scope of the proposal should encompass a single specific aim with the recognition of potential problems in the experimental design and contingency experiments to overcome them.

The proposed project should be described in a properly referenced paper distributed to each committee member at the same time as the research report. The proposal should be a maximum of 3000 words excluding figures, tables, and the bibliography. An oral presentation of the proposal must be prepared and defended by the student at the exam.

The committee will evaluate the presentations and award grades. A passing grade indicates that the student has passed both parts of the exam and satisfies the oral requirement for doctoral candidacy. Where one or both parts of the exam were deficient, an “incomplete” will be given. Additional work will then be required by the student to earn a passing mark. The nature of such work and the procedure to evaluate the results will be determined by the student’s committee. Satisfactory completion of this additional work will change the grade to “pass”. Failure to satisfactorily complete the work in a timely fashion will result in a grade of “fail”. The receipt of a “fail” grade signifies serious deficiencies that necessitate dismissal from the Ph.D. program. The Graduate Committee will determine, with input from the dissertation committee, whether relegation to the Master’s program is appropriate.

**Continuous Enrollment Policy**
See Graduate School information on CH 699 Dissertation Research Continuous Enrollment.

**Dissertation Requirements**

1. **Committee Formation**
   After consultation with their research advisor, students will designate a dissertation committee in their second semester. This is composed of five faculty members: Research Advisor (chair), three faculty from the Department of Chemistry & Biochemistry, and one from outside of the Department. This last member can be a faculty member from another UA department or an individual from off-campus. In the latter case, the individual should hold a Ph.D. (or equivalent terminal degree) and should have demonstrated record of research or scholarly activity. These individuals must be appointed to Temporary Membership on the UA Graduate Faculty.

2. **Amount of Research for Dissertation**
   As chair of the dissertation committee, the research advisor will largely determine the amount of work required for the dissertation; however, the entire dissertation committee is involved in judging both the quality and quantity of research work accomplished as well as its defense by the student.

3. **The Final Version of the Dissertation**
   A final version of the dissertation will be given to each of the committee members serving on the Dissertation Committee at least two weeks before the oral defense. The student is expected to be responsible for all aspects of the production of the dissertation, including the preparation, word processing, reproduction, dissemination to the committee members, and all costs involved. It is likely that the committee will recommend edits to the dissertation following the oral defense. All committee-requested edits must be approved prior to final dissertation submission to ProQuest.
4. Oral Defense of Dissertation

Students should register for CH 586 Research Seminar in the semester they plan to defend their dissertation. Students will schedule the seminar (public) and committee (private) defense by coordinating with their committee chair. Students must submit a Public Notice of Dissertation Defense and send research seminar and defense scheduling information to the Graduate Program Assistant at least two weeks before the scheduled defense. A majority affirmative vote by the Dissertation Committee hearing the oral defense constitutes satisfactory fulfillment of the research and dissertation requirement. Students should contact The Graduate Director shortly after the successful defense to initiate the Dissertation Defense Form for committee signatures.

5. Committee Acceptance Form

After submission of the final, approved dissertation to ProQuest, students should immediately contact the Graduate Director to initiate the Committee Acceptance Form. Students must meet the Departmental publication requirement (see Additional Academic Requirements) before the Department will submit the Committee Acceptance Form for Graduate School approval.

Time Limits for Degree Completion Requirements

See Graduate School information on Time Limits.

Student Progress Requirement

Students will hold annual meetings with their approved committee each Spring semester.

1st year - First Year Review
2nd year - Initial Research Review (IRR, CH 680 Initial Research Review)
3rd year - Oral Candidacy Exam (OCE, CH 681 Oral Candidacy Exam)
4th year plus - Annual Research Review (repeated annually until dissertation defense)

Final year - Oral Dissertation Defense

In each meeting, the student will present an update of their progress through the degree program, and the committee will provide feedback regarding the student’s progress. Students who neglect to complete the required departmental First Year Review within their first 12 months, CH 680 within their first four quarters, CH 681 within their first six semesters, or the Annual Review once annually after attaining PhD Candidacy are no longer in good academic standing. Students who are delinquent in completing any annual review have one probationary academic semester to satisfy the corresponding review requirement without penalty. Failure to satisfy the requirement within the probationary academic semester will prompt Graduate Committee review for termination of financial support and possible relegation to the Master’s Program or dismissal from the graduate program.

For both the IRR (CH 680) and OCE (CH 681), students must earn a "pass" to remain in the program. The committee can request that additional work be completed to address any deficiencies in the presentation or written documents prior to awarding a passing grade. All remediation must be completed by the end of the following semester or the course grade will default to "fail", with relegation to the M.Sc. program or immediate dismissal from the graduate program, at the discretion of the Graduate Committee.

The dissertation committee determines by majority vote if a student is making adequate research progress commensurate with their time in the program during required annual reviews. If the committee determines the student is not making adequate research progress, students will be granted one probationary semester with financial support to remedy productivity deficiencies, as assessed by the dissertation committee. Failure to meet minimum research expectations by the end of the probationary semester will result in immediate termination of financial support and may prompt relegation to the Master’s Program, at the discretion of the Graduate Director and Department Chair.

Students must have an approved research advisor after their first semester to be in good academic standing. Students without an approved advisor may not register for required CH 660 Adv Research Techniques Chem or CH 699 Dissertation Research courses and, therefore, make progress toward a PhD degree. Students without an advisor will be granted one full semester or full summer term to find a Department approved research advisor. Failure to do so will result in relegation to the Plan I M.Sc. program, possibly with one additional semester of financial support, at the discretion of the Graduate Director and Department Chair.

Additional Academic Requirements

At the time of their PhD defense, the PhD candidate must have at least one officially accepted or published peer-reviewed publication involving novel research the candidate completed at UA. In lieu thereof, the student may request examination of their completed dissertation for novel, publishable work by a Graduate Committee approved external referee who is an expert in the field of the dissertation research project. External review requests must be submitted at least five weeks prior to the scheduled dissertation defense date. A positive external review of the dissertation will satisfy the departmental research publication requirement but no other PhD degree requirement.

Students are required to register for CH 585 Chemistry Seminars each semester unless there is a conflict with TA responsibilities. In most cases, students will exceed the minimum 6 hours required.

Academic Misconduct Information

See Graduate School information on Academic Misconduct.

Withdrawals and Leave of Absence Information

Students wishing to withdraw from the program or pursue a leave of absence should contact the Graduate Director. Also see Graduate School information on Withdrawals and Leave of Absence.

Academic Grievances Information

See Graduate School information on Academic Grievances.

Grades and Academic Standing

The student must maintain a cumulative average grade of not less than “B” (3.0) in graduate courses taken at The University of Alabama to be eligible for renewal of either a teaching or research assistantship. Courses in which a student has earned a grade of “P” are not considered in making evaluations of academic standing. Graduate students will be permitted a maximum of two grades of less than “B” in lecture courses. Regardless of grade point average, receiving three grades of “C” or failure in any course (“D” or “F” grade) will result in a review of the student’s performance by the Graduate Committee. This review will determine whether the student should continue to receive financial support and/or be dismissed from the program at the end of the semester in which the non-passing grade is earned or at the end of the following semester. A
decision will be rendered prior to the end of the semester in which a third 'C' and/or a 'D' or 'F' grade is reported.

Students who neglect to complete the required departmental First Year Review within their first 12 months, CH 680 within their first four semesters, CH 681 within their first six semesters, or the Annual Review once annually after attaining PhD Candidacy are no longer in good academic standing. Students who are delinquent in completing any annual review have one probationary academic semester to satisfy the corresponding review requirement without penalty. Failure to satisfy the requirement within the probationary academic semester will prompt Graduate Committee review for termination of financial support and possible relegation to the Master's Program or dismissal from the graduate program.

Also see Graduate School information on Grades and Academic Standing.

**Graduate School Deadlines Information**
See Graduate School information on Deadlines.

**Application for Graduation Information**
See Graduate School information on Application for Graduation.

**Acquisition of Financial Support:**
All students in good standing in the Chemistry PhD program are normally supported by a graduate research assistantship (GRA) funded through their advisor, a graduate teaching assistantship (CTA) funded by the Department, or a fellowship. Both types of assistantships provide an equivalent stipend and benefits along with paid tuition and fees. Financial support is guaranteed through the first five years in the program for all PhD students who meet performance expectations and who do not meet any Conditions for Termination of Financial Support (see below). Students will be informed of impending financial support termination at least one semester prior to the support termination date except in the special cases noted under Conditions for Termination of Financial Support. Students in good standing may petition the Director of Graduate Studies for continuing GTA support beyond the fifth year on a semesterly basis. Petitions for continuing support must be submitted to the Director of Graduate Studies at least three months prior to the start of the final semester of guaranteed support. Students in good standing with GRA support beyond the fifth year may continue at their advisor’s discretion until GRA support is either exhausted or terminated by their advisor.

**Fellowship Nominations:**
Eligible students who excel in the program may be nominated by the Department for UA fellowships. Nominees are selected by departmental faculty vote based upon prospective nominee research productivity, academic performance, and contributions to the Department. Fellowship recipients are guaranteed paid tuition and fees, a stipend, and benefits at least commensurate with those provided through GRA or GTA support.

**Performance Expectations for Continuing Financial Support:**
- The student must be in good academic standing in the Chemistry PhD program. In general, students in the Chemistry MSc program do not receive departmental financial support.
- The student must remain clear of all infractions outlined under Conditions for Termination of Financial Support.
- The student must complete all mandatory annual training and abide by all rules and policies held by The University of Alabama, The UA College of Arts and Sciences, UA Environmental Health and Safety, and the Department of Chemistry and Biochemistry.
- Graduate teaching assistants must adequately perform all duties assigned to them in a timely manner as defined by the instructor of record or their designee for all courses to which the student is assigned teaching, grading, and/or laboratory preparative responsibilities.
- Beginning in the second semester, students must conduct research under the direction of a department-approved research advisor as dictated by the expectations in corresponding CH 660 and CH 699 syllabi. Continuous research progress is expected beginning in the second semester as directed by the research advisor and the student’s dissertation committee.

**Conditions for Termination of Financial Support:**
Students who meet one or more of the following criteria will be subject to termination of financial support pending Department of Chemistry and Biochemistry administrative review. Depending upon the severity of the infraction or the extent of non-compliance, the Department Chair and Graduate Director—with input from the Graduate Committee—will recommend immediate termination of financial support, termination of financial support at the end of the current semester, or termination of financial support (partial or full) at the end of the following semester.

- **Dereliction of duty.** Dereliction of duty includes but is not limited to: failure to comply with all UA safety and interpersonal conduct policies; absence from scheduled obligations without prior notification to the instructor of record or designee (for teaching assistants) or the research advisor (for research assistants); or failure to satisfactorily complete all activities associated with the funded position as defined by the instructor of record or designee (for teaching assistants) or by the research advisor (for research assistants) and the student’s departmental memorandum of appointment.
- **Resolved finding of Academic Misconduct.** Penalties, including potential loss of financial support, will be determined with guidance from the UA Graduate School and/or the UA College of Arts and Sciences.
- **Failure to have a department-approved research advisor for more than one semester.** Students without an approved research advisor may not enroll in CH 660 or CH 699 courses and, therefore, cannot proceed toward degree completion. Students without an advisor may be relegated to the Plan I Master’s Program with one additional semester of financial support, at the discretion of the Graduate Director and Department Chair.
- **Loss of good academic standing.** Students not in good academic standing have one probationary academic semester after notification of their change in academic status to return to good academic standing—with the non-passing grade exception noted below. Financial support will be terminated if good academic standing is not restored by the end of the probationary academic semester. Students who earn more than two grades of 'C' or at least one grade of 'D' or 'F' in graduate courses will have a compulsory academic performance review by the Graduate Committee. This review will determine whether the student should continue to receive financial support and/or be dismissed from the program at the end of the semester in which the non-passing grade is earned or at the end of the following semester. A decision will be rendered prior to the end of the semester in which a third 'C' and/or a 'D' or 'F' grade is reported.
- **Delinquent Annual Review.** Students who neglect to complete the required departmental First Year Review within their first 12 months, CH 680 within their first four semesters, CH 681 within their first six semesters, or the Annual Review once annually after attaining PhD Candidacy are no longer in good academic standing. Students who are delinquent in completing any annual review have one
probationary academic semester to satisfy the corresponding review requirement without penalty. Failure to satisfy the requirement within the probationary academic semester will prompt Graduate Committee review for termination of financial support and possible relegation to the Master’s Program or dismissal from the graduate program.

- **Insufficient continuous research progress.** The dissertation committee determines by majority vote if a student is making adequate research progress commensurate with their time in the program during required annual reviews. If the committee determines the student is not making adequate research progress, the student will be granted one probationary semester (i.e., academic semester or full summer term) with financial support to remedy productivity deficiencies, as assessed by the dissertation committee. Failure to meet minimum research expectations by the end of the probationary semester will result in immediate termination of financial support and may prompt relegation to the Master’s Program, at the discretion of the Graduate Director and Department Chair.

**Faculty**

**Chair**
Dr. Greg Szulczewski

**Graduate Program Director**
Dr. Tim Snowden

**Director of Graduate Admissions**
Dr. Marco Bonizzoni