University of New Mexico

Department of Chemistry & Chemical Biology

Graduate Handbook

Fall 2017

INTRODUCTION:

This handbook describes the graduate program and degree requirements for the Department of Chemistry & Chemical Biology (CCB) at The University of New Mexico (UNM). University requirements may be found in the current UNM Catalog at: http://catalog.unm.edu/catalogs/2014-2015/graduate-program.html. Students are responsible for knowing and understanding these requirements and for making satisfactory progress toward fulfilling them. This document outlines the specific and additional requirements for CCB. Questions about requirements should be directed to the Graduate Coordinator and/or the chair of the Graduate Studies Committee.

The CCB graduate program is overseen by the Graduate Studies Committee (GSC), a standing committee of tenure-track faculty appointed by the department chair. The GSC is responsible for advising first year students, overseeing the graduate program, and evaluating graduate student performance throughout their tenure in the CCB graduate program.

The CCB graduate program offers a Doctor of Philosophy (PhD) and a Master of Science (MS; with or without a thesis) degree. The PhD is a research-oriented degree that prepares students for scientific careers as independent investigators and group leaders in academia, research institutes, national laboratories and industry. The thesis MS is a research degree of lesser scope and independence, intended to prepare students for scientific careers including research; the non-thesis MS is intended as a preparation for professional chemists who will not conduct research.

GENERAL POLICIES:

All students are expected to enroll full time each semester. No more than 11 credits the first semester of graduate school and up to 12 hours for each fall and spring semester thereafter. The Graduate Studies Committee recommends which courses students will take during their first year. Starting the student's second year, the student will meet with their Research Director for which courses to take to support their graduate research.

After completing formal coursework requirements, students must enroll in CHEM 650 (Research/Readings) until they are advanced to candidacy. After the student advances to candidacy, they must enroll in CHEM 699 (Dissertation). If a student is working on a master's program with thesis, they must register for CHEM 599 (Master's Thesis) after completing their formal coursework requirements. The student should consult his/her Research Adviser or the Graduate Coordinator before registering for any courses. Students should not enroll in coursework during summer sessions unless the student will be graduating during the summer session. In this case, the student must enroll in at least 3 credit hours of CHEM 699 for Dissertation or 1 credit hour of 599 for Master's Thesis or 2 credits of CHEM 650 if they are doing a coursework Master's.

All CCB graduate students are expected to maintain the highest standards of honesty and integrity in academic and professional matters. Academic ethics violations such as cheating or plagiarism can carry severe penalties, up to and including dismissal from the graduate program. Students are expected to earn a "B" or better (not B-) in CCB courses. Students are also required to maintain a cumulative GPA of 3.0 or higher during their graduate studies at UNM. Failure to maintain a cumulative minimum 3.0 GPA or to make adequate annual progress in courses and/or research may lead to dismissal, movement from the PhD to MS track and/or termination of financial support. Graduate students on teaching assistantship (TA-ship) are also expected to receive satisfactory evaluations from the students enrolled in the course and from the faculty member in charge of the course. All students are responsible for knowing and complying with UNM and departmental academic regulations. Ignorance of a rule or policy will not be accepted as an excuse for non-compliance.

STUDENT ASSISTANTSHIPS:

A graduate assistantship is a financial award to a graduate student for part-time work in teaching or research while pursuing study toward an advanced degree. In CCB, both teaching assistantships (TA-ships) and research assistantships (RA-ships) are available. Graduate assistantships typically obligate the holder to 20 hours of work per week at the discretion of the instructor in charge (TA-ship) or research director (RA-ship). Both RA and TA

contracts allow a tuition waiver of up to 12 credit hours for each fall and spring semester. Tuition will not be paid in the summer unless the student plans on graduating during the summer semester.

Duties of teaching assistants (TA's) may include but are not limited to preparation of experiments, supervision of lab sections, holding recitation sections and office hours and grading. TA's report to the instructor in charge of their assigned course/s and obtain specific assignments from that instructor.

TA's are expected to work the week before the fall and spring semester classes preparing for the upcoming semester. TA's are also expected to be on campus during the week of final exams. Exceptions to this policy require written approval of the instructor in charge and violations may lead to serious penalties. All teaching assistants must enroll in CHEM 500, Scientific Teaching in Chemistry their first semester as a TA.

The performance of all TA's will be reviewed every semester by the Teaching Performance Committee. The Teaching Performance Committee consists of four members: a representative of the Graduate Recruitment and Selection Committee, a representative of the Graduate Studies Committee, the Undergraduate Laboratory Supervisor and the instructor in charge. This Committee is responsible for reviewing Teaching Assistant performance and has the power to change Teaching Assistant status. Consistently poor or irresponsible performance by Teaching Assistants may result in the student being placed on probationary status, or in extreme cases, losing their financial aid altogether. If TA performance is deemed unsatisfactory, students will be required to enroll in CHEM 500 an additional semester constituting a probationary period.

Research assistants (RA's) participate in research work that is relevant to the assistant's thesis, dissertation or other requirement for a graduate degree. The RA is supervised by an adviser, who both directs the research and evaluates the RA's performance. Typically, students are expected to carry out research during the entire year including the summer. RA's should discuss and coordinate plans for vacation or leave with their research advisers.

LIMITATIONS ON FINANCIAL AID:

The Department of Chemistry & Chemical Biology restricts departmental financial aid in the form of Research and Teaching Assistantships to a maximum of six calendar years from the date of entrance. At the end of the fifth year, the student's overall progress will be evaluated to determine their eligibility for a sixth year of support.

If, in the opinion of a student's adviser and the GSC, a student shows little promise of completing the degree program, the Department will notify the student and the Graduate School in writing that the student is suspended from further work in the program.

DOCTOR OF PHILOSOPHY (PhD) PROGRAM:

The PhD program requires coursework, a written and oral candidacy exam, defense of a dissertation proposal, and the successful writing and defense of a dissertation. Completion should require 4-5 years of full-time study, assuming normal progress. In general, first year activities focus on teaching, coursework and selecting an adviser, while the second year focuses on completing coursework, passing the candidacy exam and proposing and initiating dissertation research. The final 2-3 years focus almost exclusively on research and writing and defending the dissertation.

First year PhD students typically take 2-3 graded 5xx level classes per term, take any required introductory classes, attend departmental colloquium and teach undergraduate laboratory sections. Students are expected to investigate the research programs of departmental faculty, and choose a laboratory in which to carry out their dissertation research. In consultation with their Research Advisers, students choose the members of their Committee on Studies (COS) before the end of the spring term. Most first-year students are on TA-ship during the academic year, and assessment of student progress by the GSC relies primarily on coursework performance and evaluation of teaching performance.

Second year PhD students typically complete their coursework requirement, participate in graduate seminars and research group meetings, and prepare for and take their candidacy exam and dissertation proposal defense. In addition, these students begin to accrue a collection of experimental techniques and protocols necessary to carry out successful dissertation research. Student progress is evaluated by the COS, which will monitor student progress toward synthesizing background material and experimental approaches relevant to the dissertation project, and will provide the student with constructive feedback.

Students who have passed the written and oral candidacy exam are considered admitted to candidacy for the PhD, and are expected to concentrate their efforts on their dissertation research. After admission to candidacy students have a maximum of five years to defend and submit their dissertations. Progress toward this goal is evaluated annually by the adviser and COS. NOTE: Financial support from the department (TA or RA-ship) is guaranteed only for students in good standing (making good progress) for five years from the date the student entered the department.

PhD COURSEWORK:

48 hours of graduate coursework including the following:

- 18 hours of graded (A, B, …) coursework must be 500 level or above including at least 12 hours in Chemistry courses. Colloquia, seminars and teacher training courses do not count toward this requirement
- At least 4 hours of graduate seminar CHEM 625 (Divisional Seminar)
- At least 4 hours of departmental colloquium CHEM 623
- Enough hours of graduate credit (CHEM 650 or 623) to meet the total of 48 hours (not more than 24 hours of CHEM 650)

18 hours Dissertation (699)

SELECTING A RESEARCH ADVISOR:

All PhD students must have an assigned research adviser by January 15 of the first spring semester to ensure adequate research progress and funding during the summer. The selection of an adviser is based on mutual preference (student and faculty), the availability of funding and faculty needs. Two meetings from the graduate recruit committee and the GSC are scheduled to discuss student distribution and assignment. Official assignment of a student to an adviser requires signatures of the student, the adviser and the chair of the GSC. Information on potential advisers and their research is available from the CCB website, formal research presentations, and individual meetings with faculty.

TIMETABLE:

By November 30 of the fall semester, first year students should have met with at least three different potential advisers to discuss research; each student must submit a ranked list of three potential research advisers to the GSC. The CCB faculty will use these lists, their own preferences, and information on RA support and faculty needs to match students with suitable advisers.

By December 10, the GSC will inform each student of his or her adviser match. Any requests for a different adviser must be made to the GSC by December 17 of the fall semester. By the 1st day of spring semester, the adviser assignment form, signed by student and the adviser, must be submitted to the GSC for approval by the GSC chair.

NEW RESEARCH DIRECTOR:

In some cases (illness, faculty leaving the department, etc.) a student must select a new research adviser. This selection process should be undertaken under the direction of the GSC chair, and requires the mutual agreement of the student, the new adviser and the chair. Once a new adviser has been selected, the student should notify the Graduate Coordinator and, with the advice of the new adviser, select a new COS by the end of the semester. The new COS will then decide what portion of the student's completed work can be used towards his or her PhD dissertation. The COS will examine the student's progress and assess whether the student has the appropriate skills and background to undertake the newly selected research program. In the situation where a student cannot find another adviser, the student must leave the department, as there will be impossible to meet all requirements for the PhD degree.

COMMITTEE ON STUDIES:

Following the selection of a Research Adviser, a PhD student must select a Committee on Studies (COS). The composition of this committee is outlined in the University of New Mexico catalog under "Graduate Program Composition of the Dissertation Committee." The COS has a minimum of four members, including at least one external member who does not have a primary appointment in CCB. The COS is chaired by the student's adviser. Students are expected to write their annual research progress report and meet yearly with their COS to review progress on research problems, plans, expectation, and appropriate degree requirements. Depending on the field of research, the COS may require the student to exhibit competence in additional areas such as mathematics, physics, computer programming, electronics, etc.

SEMINARS:

The Department of Chemistry & Chemical Biology has a two-part seminar program:

1. **Divisional Seminars** dealing with material in each of the three areas of chemistry: Biological Chemistry/Chemical Biology/Medicinal Chemistry; Physical Chemistry/Energy/Materials, and Catalysis/Synthesis, are formalized in CHEM 625 (Chemistry Seminar). With the exception of their first fall semester, students must register for a section that deals with their area of concentration every semester until the end of the 3rd year. During students' second and later semesters, they must register for a divisional seminar. It is expected that all graduate students participate in the division seminar program while they are at UNM. The divisional seminar is charged and organized by a participating faculty. Grades are assigned by participating faculty in each division as either credit (CR) or no credit (NC).

   The seminar format is determined by each division and may include journal clubs and student presentations. For a PhD degree, the student must present two research seminars in the 2nd and/or 3rd years with at least score of pass as one of the requirements toward his/her PhD degree. For a MS degree, one presentation must be given in the 2nd year. The presentation topic should not be directly related to his/her research. The presentation materials should be from current literature but excluding review articles. The presentation topic and abstract must be sent to Faculty and students at least 3 days before the seminar date. The Faculty will evaluate the presentation with a score of merit, pass or no pass. The failure of the presentations requires redoing it.

   Part-time students who work at Los Alamos National Laboratory may register for CHEM 625 if they make arrangements to attend weekly seminar at LANL and give their presentation at a Divisional Seminar (CHEM 625) at UNM. The students' Committee on Studies must approve these arrangements at the beginning of the semester. The LANL member of this committee reports on students' attendance at LANL seminars to the faculty member responsible for the corresponding CHEM 625 section that grades the students accordingly.

2. **Departmental Seminars** consist of lectures given by invited speakers. All graduate students must register for CHEM 623 (department colloquium) for at least 4 semesters. After fours semesters, attendance is required but registration is not. Missing more than two Departmental Seminars in one

semester will result in a NC being given. Students will not read papers or use PDAs, computers, etc., during seminar and those caught doing so will have materials confiscated.

DISSERTATION RESEARCH PROPOSAL:

Defense of the dissertation research proposal must be completed by the last day of the student's fourth semester in the program (not including summer), unless an extension is approved by the COS and the Graduate Studies Committee. If a student fails the defense, they may be allowed one additional attempt pending approval by the COS. This attempt must be completed no later than the end of the fifth semester. The COS may require students to repeat any or all parts of the proposal and defense. A second failure on any part of the requirement will prevent the student from continuing in the PhD program.

All students must submit a signed Announcement of Exam form to the Chemistry & Chemical Biology Department Advisement Coordinator at least two weeks prior to the scheduled RP. See the Advisement Coordinator for a copy of this form.

DISSERTATION RESEARCH PROPOSAL RULES AND GUIDELINES:

The dissertation research proposal represents a thoroughly documented summary of the research that the student expects to perform prior to writing their Dissertation. The written version of the proposal should consist of a concise narrative describing the intended doctoral research project. The written proposal should be fully documented, with appropriate references to the primary chemical literature. It should state clearly and concisely the objective(s) of the research and provide sufficient background to convey the rationale for undertaking the research. Particular emphasis should be on the motivation and background for the work as well as alternative approaches for carrying out the proposed work. Finally, key aspects of the planned method should be described briefly and their viability documented and justified. The fully referenced proposal with abstract should be distributed to the students' COS two weeks prior to the defense.

RESEARCH PROPOSAL GUIDELINES:

These are only guidelines - it will ultimately be between the student and the COS how the RP will be written and orally presented.

Abstract - approximately 400 words which states your objectives and goals
Introduction - approximately 1½ - 2 pages of a brief literature overview
Statement of Research Problem - not more than ½ of a page long
Statement of Goals and Objectives - not more than ½ of a page long
Research Plan - approximately 3 - 4 pages
Conclusion - approximately ½ of a page long
References

The total length should not exceed 10 pages, including references, figures, schemes, and equations. The style should be 12 pt. Times or Times Roman font, single spaced with 1" margins all around. A cover page should be included which has the title of the RP, the student's name, and the names of the committee members listed.

ORAL PRESENTATION GUIDELINES:

The organization of the oral RP should be similar to the written presentation, and should include the same sub-headings. The oral presentation should be approximately 25-30 minutes in length, excluding a question period.

DEFENSE OF DISSERTATION:

Candidates for a PhD degree are required to perform significant and independent research that culminates in the preparation and defense of a Dissertation. Each student's research is conducted under the supervision and direction of their adviser and COS. Oral defense of the Dissertation begins with a public seminar in which

students present and summarize their research and the student answers questions from the audience (moderated by the adviser). This public seminar is followed by a private oral examination by the student's adviser and COS.

Students completing a PhD must submit a Dissertation in approved UNM format. Students should consult the graduate bulletin and/or obtain detailed format guidelines from the Office of Graduate Studies. Electronic copies of the finished and approved Dissertation must be submitted to the graduate school, the CCB Advisement Coordinator and members of the examining committee.

Continuous enrollment in Dissertation (CHEM 699) hours is required in subsequent semesters (exclusive of summer) after initial enrollment in CHEM 699 until the Dissertation is accepted by the Dean of Graduate Studies. This rule applies whether or not the candidate is enrolled for other credit hours. Candidates who fail to register for CHEM 699 or CHEM 599 in any semester must pay tuition and late fees for each missed semester and petition the Office of Graduate Studies for reinstatement. In extraordinary circumstances, the Dean of Graduate Studies may waive the requirement for continuous enrollment upon presentation of a written request from the Dissertation Director and the graduate unit. Doctoral candidates must be enrolled for a minimum of 3 hours of CHEM 699 during the semester in which they complete their degree requirements, including the summer session.

Students must submit a signed Announcement of Exam form at least two weeks prior to their scheduled Dissertation Defense, and submit a signed Report of Exam Form immediately following their defense. A public notice of the Dissertation Exam defense should be made by posting announcements within the Department at least one week ahead of the scheduled defense. All students must also submit a signed Report of Dissertation Form for each committee member (one form for each member). These for should be submitted to the Advisement Coordinator.

MASTER OF SCIENCE PROGRAM:

The MS program emphasizes coursework, and may require (Plan I) the successful writing and defense of a thesis. Completion should require 2 years of full-time study, assuming normal progress. MS students may follow a path similar to first year PhD students, typically taking 2-3 graded 5xx level classes per term. Additionally, they will take any required introductory classes, attend departmental colloquium and teach undergraduate laboratory sections. Students are expected to investigate the research programs of departmental faculty, and choose a laboratory in which to carry out their thesis research (if Plan I). In consultation with their Research Advisers, students choose the members of their Committee on Studies (COS) before the end of the spring term. Most first-year students are on TA-ship during the academic year, and assessment of student progress by the GSC relies primarily on coursework performance and evaluation of teaching performance.

The MS program has two distinct tracks--Plan I (Master's Thesis) and Plan II (Coursework Master's). The requirements for completion are listed below:

PLAN I - MASTER'S THESIS:

24 total hours including the following:

- 15 hours of graded (A, B…) coursework
- 6 of the 15 credit hours must be at the 500 level or above

- Required core courses:

    - CHEM 511
    - CHEM 521
    - CHEM 536
    - CHEM 501

- 2 - 4 hours of CHEM 625 (Divisional Seminar)

6 hours Thesis (599)

PLAN II - COURSEWORK MASTERS:

30 total hours including the following:

- 18 hours of graded (A, B…) coursework
- 12 of the 18 credit hours must be at the 500 level or above

- Required core courses:

    - CHEM 511
    - CHEM 521
    - CHEM 536
    - CHEM 501

- 2 - 4 hours of CHEM 625 (Divisional Seminar)