

DOCTORAL PROGRAM HANDBOOK FOR
MEDICINAL BIOCHEMISTRY
DEPARTMENT OF
CHEMISTRY AND BIOCHEMISTRY



April 2015

Introduction

This handbook is for new graduate students in the PhD degree program. It provides information on the overall graduate program, academic requirements, Departmental procedures, and other miscellaneous information. In addition to the specific points concerning degree requirements contained in this handbook, you should read carefully the section of the Graduate School Bulletin covering regulations governing the PhD degree. This gives more complete information concerning general academic regulations, important deadlines, applying for graduation, filing of dissertations, and other information.

We take pride in the fact that the Department has a size and attitude that are conducive to informal and close contacts between our faculty, staff, and students. You are always welcome to come to the Department office, Room 435, at any time to talk with the Department Head or to the office of the Director of Graduate Studies, Room 416, about any concerns you may have. We know you will find other members of the faculty equally approachable.

We hope you will have a successful and rewarding experience in your graduate work with us. We are glad you have chosen our program and look forward to your contributions to it.

Educational Goals and Objectives of the Program

Goal: Provide a Ph.D. program that will prepare its graduates for a career in biochemical research with outstanding fundamentals in biochemical knowledge, and the ability to be independent scientists who can be leaders on professional projects during their career.

Objectives:

1. Provide a foundation of course work that will impart fundamental knowledge in aspects of biochemical processes
2. Offer research opportunities that educate students in core skills in designing, carrying out, and reporting results of quality scientific projects
3. Provide students with a foundation in the biochemical basis of drug action and drug design
4. Prepare students for careers in pharmaceutical research and development, as well as in academics and in government laboratory supervision in the chemical life sciences
5. Provide students with the skills necessary to develop an independent research project, to consider aspects of financing such a project, and leadership skills necessary to accomplish the projects objectives

Overview of Program

The Ph.D. degree in Medicinal Biochemistry combines advanced biochemical and medicinal chemistry course work with cutting edge research in the biomedical and biochemical sciences. Additional course work is offered in specialized areas such as synthetic chemistry, bio-analytical chemistry, and computational chemistry. The student must write a dissertation culminating from extensive laboratory research experience carried out under the direction of a research advisor. In addition, students gain experience in professional speaking by giving public oral scientific presentations through the departmental seminar program. The successful doctoral candidate will be well prepared for careers in biotechnology, pharmaceutical research, medical research, or academia.

PhD in Medicinal Biochemistry

The Department of Chemistry and Biochemistry offers a graduate program of study leading to a Doctor of Philosophy (Ph.D.) degree in Medicinal Biochemistry.

You will need to complete 56 credit hours with a B average (GPA = 3.0) to graduate. If you have an assistantship, you will need to maintain a GPA of 3.0 at all times to keep the assistantship. To complete the program in 4-5 years, you will need to take 6-9 credit hours in each semester, excluding summer. You do not need to register for any courses during the summer semester, unless you graduate during the summer. If you intend to graduate in summer, you must register for one credit of dissertation (CHE 799). All 56 credits must be completed within seven years.

Required Core Courses: Two of the following courses (6 credits)

CHE 651 Advanced Medicinal Chemistry (3 credits)

CHE 656 Enzyme Mechanisms (3 credits)

CHE 659 Receptor Biochemistry (3 credits)

CHE 658 Nucleic Acid Biochemistry (3 credits)

CHE 660 Biochemical Pharmacology and Disease Targets (3 credits)

Research Techniques (25-37 credits)

Students take CHE 691 before beginning research. Students must carry out research project(s) under the supervision of a graduate faculty member and register CHE 780 for credits. Upon passing the comprehensive examination (see below), students will be qualified to register for CHE 799.

CHE 691 Introduction to Graduate Research (1 credit)

CHE 780 Research Problems in Chemistry and Biochemistry (12-18 credits)

CHE 799 Dissertation (12-18 credits)

Seminars (2 credits)

Students must present two seminars, the first on a literature topic that is not directly related to their dissertation (CHE 751) and the second on their dissertation research (CHE 752). The first seminar is typically presented in the first or second year of study, and second seminar is typically presented during the last semester of study.

CHE 751 Literature Seminar (1 credit)

CHE 752 Dissertation Seminar (1 credit)

Electives (12 hours minimum)

Up to 12 credits may be earned from graduate courses in chemistry, biochemistry, biology, mathematics or physics. The student's coursework plan must be approved by the departmental Graduate Studies Committee and the student's Dissertation Committee.

Comprehensive Examination

The comprehensive examination consists of a written research proposal and oral presentation based on the student's dissertation research. The written proposal is typically prepared using NIH guidelines, and should include a literature review, hypothesis, specific aims, preliminary data, research design and methods, timeline and references. Following a public oral presentation of the proposal, each student must defend their proposal in front of their dissertation committee. Each Ph.D. student must pass the comprehensive examinations (both written and oral) before the end of their second year. After successful completion of the comprehensive examinations, students may begin enrolling for dissertation research, CHE 799.

Other Requirements

Directed dissertation research: Students will choose a research advisor and should begin their dissertation research within the first 3 months of joining the program.

Seminar: Students are required to attend all departmental seminars.

Dissertation Committee: Students must choose a dissertation committee prior to the completion of 18 credit hours in the program. The committee must consist of 4 members of graduate faculty, two of which must be full members. One of the committee members is the student's research advisor, who serves as the chair of the committee and must be a graduate faculty member of the home department.

Dissertation: Students must complete a written research dissertation and give a public oral presentation of their completed work while registered for CHE 752 seminar. In addition, the student must defend the dissertation orally in front of his/her dissertation committee. The seminar and dissertation defense should occur in the same semester that the student applies for graduation. If the research work in his/her dissertation have involved the contributions from other students and/or research collaborators both

inside and outside the Department, the contributions from each person must be clearly defined.

Annual Evaluation: Each year students will be required to give an oral annual presentation to the graduate faculty in the Department of Chemistry and Biochemistry. This presentation will provide an opportunity to review and evaluate progress in the program, and to ensure that all important milestones have been completed. Participation in the annual evaluation is mandatory for all Ph.D. students enrolled in the program. Unsatisfactory evaluation may lead to the termination of the student's assistantship.

Graduate Faculty

R. Bruce Banks, PhD, Bioorganic chemistry, chemical carcinogenesis, xenobiotic metabolism.

Nadja B. Cech, PhD, Analytical Chemistry, Mass spectrometry, liquid chromatography, phytochemistry.

Norman H. L. Chiu, PhD, Bioanalytical Chemistry, Interdisciplinary approach to develop new or improved analytical methods for measuring specific biomarkers

Liam M. Duffy, PhD, Physical Chemistry, Gas-phase chemical reaction dynamics probed by millimeter wavelength spectroscopy.

Alice E. Haddy, PhD, Biophysical Chemistry, electron paramagnetic resonance studies of transition metals in biological systems.

Terence A. Nile, PhD, Synthetic Organometallic Chemistry, cyclopentadiene and polypyridyl chemistry, catalysis, organometallics in organic synthesis.

Nicholas H. Oberlies, PhD, Natural Products Chemistry, Isolation and characterization of bioactive natural products.

Kimberly S. Peterson, PhD, Organic Chemistry, Asymmetric , methodology development.

Gregory M. Raner, PhD, Bioinorganic chemistry, Enzymology, mechanistic studies and industrial applications of cytochrome P450 monooxygenase enzymes (Director of Graduate Study).

Jason J. Reddick, PhD, Bioorganic Chemistry, Biochemistry, biosynthesis of polyketides.

Patricia H. Reggio, PhD, Physical chemistry, Computational chemistry, G protein-coupled receptor modeling (cannabinoid CB1 and CB2 receptors) (Head of Department).

Ethan Will Taylor, PhD, Medicinal Biochemistry, Molecular modeling and bioinformatics, molecular virology, biochemistry of selenium.

Jerry L. Walsh, PhD, Inorganic Chemistry, Coordination chemistry of transition metal complexes, synthesis, photochemistry, reaction mechanisms.

Qibin Zhang, PhD, Analytical Chemistry, metabolomics and proteomics.

Specific Policies

Admissions Policies: Applications will be reviewed once every year following the submission deadline for completing applications. Files completed after the deadline usually will not be reviewed until the following year. Exceptions to this review schedule can be made at the request of the Department Head to accommodate unusual situations or departmental needs related to assistantships.

Students selected for admission to the Medicinal Biochemistry Ph.D. Program will be notified by the Graduate School. Any questions regarding your status should be directed to Dr. Norman Chiu, Director of Graduate Studies (prof.chiu@gmail.com).

Entrance Exams: Upon arrival at UNCG, all students will be required to take the American Chemical Society Organic Chemistry and General Chemistry exams as a qualifier for certain advanced courses as well as the assignments of their teaching responsibilities if teaching assistantships are provided. These exams will be scheduled during the orientation week. Failure to receive an acceptable grade on these qualifiers (as determined by the respective departmental committee and graduate studies committee) will result in the student being required to take remedial coursework in the area of deficiency. This may include taking one or both semesters of sophomore Organic Chemistry, or directed remediation, as determined by the committees.

Introduction to Graduate Research: Before beginning research, students should take CHE 691, Introduction to Graduate Research, for one credit during the first semester.

CHE 780 is taken to get started on research under the instruction of your selected research advisor. Once you pass the comprehensive examination, you may register for CHE 799. You may register for CHE 780 and CHE 799 concurrently until all 18 credits of CHE 780 are completed.

Seminars: All graduate students are required to give two seminars for credit (CHE 751 and CHE 752). The first is a literature seminar on a topic that is not directly related to your dissertation research. The second seminar is a presentation of your dissertation research and should generally be given in the last semester prior to your graduation.

All students, regardless of whether they are registered for a seminar course, are required to attend all seminars related to CHE 751/752, as well as additional symposia and guest seminars.

Registering for Research: To get started on research, you should sign up for one credit of "Introduction to Graduate Research" during your first semester. For this credit of research, you will meet with other new students to discuss aspects of research and choose a research advisor by the end of the first semester. During the second semester, you should register for one or two credits of CHE 780 under the section of your research advisor. You will use this semester to choose a research project, become familiar with the background literature, and learn research techniques. During the first summer, you should complete initial experiments for your dissertation. You should also write most of

your research proposal and be planning to meet with your dissertation committee by the beginning of the second Fall Semester to schedule your comprehensive examination, which should be completed by the end of your second year. After the research proposal is approved and defended, you may register for CHE 799 (Dissertation).

You are expected to work on your research project at least 6 hours per week for each credit of CHE 780 or CHE 799 that you are registered for. During the summer, full time students who are supported by an assistantship are expected to work full time (minimum of 40 hours per week) on research. In general, you should actually spend as much time as possible on your research project. The primary goal of the research requirement is to produce a quality research dissertation and the credit hours given, are, in a sense, incidental. A well-done research project will be an extremely attractive addition to your academic record for any future career move, so it is to your advantage to make it a very high priority.

Students normally take all 15-18 credit hours of CHE 799 by the time they graduate. Students can also register for up to 18 credit hours of CHE 780. You will receive a letter grade for CHE 780, so it is important to perform well when registered for it. The grade assignment in CHE 799 is IP (in progress) until you pass your dissertation defense and submit the accepted dissertation to the Graduate School, when the grade is changed to S (satisfactory).

You must register for at least one credit hour during the semester in which you graduate. With permission, you can use the last credit hour of CHE 799 for this purpose or, if you have taken all six credits of CHE 799 and completed all other degree requirements, you can register for CHE 802, Dissertation Extension. Registration for CHE 802 does not count as credit toward your degree, but does allow you to use University facilities, maintain full time status, and graduate.

Choosing a Research Area and Director: During your first semester, you should arrange informal meetings with at least four faculty members to discuss the types of problems available for PhD dissertation research under their direction. You can choose who to interview based on information on the Department web page, the “Research Opportunities” booklet published by the Department, or the introductory talks that are often presented at the beginning of the Fall Semester. Each time you interview a professor, you should have him or her sign the “Research Director Selection” form (included in this information packet). Once you have come to an agreement with a professor who is willing to direct your research, return the form indicating your preference for research director to the Department Head by the first Friday in December (if you entered in the Fall) or by the last Friday in May (if you entered in the Spring). There are some Department guidelines concerning the maximum number of graduate students that a professor may direct and it will be necessary to check these guidelines before the selection can be approved. Part-time students should choose a research director by the end of their second semester in the program. Once you have selected your research director, most of your subsequent advising will be through that person, although the Director of Graduate Study will be listed in the records as your official advisor. Notice that you are free to select a research director as soon as you are able,

rather than waiting until the end of the first semester. The sooner you can get started on your research, the more likely you will complete your dissertation on schedule.

Dissertation Committee: Each student is assigned to the Director of Graduate Studies as his/her temporary advisor in the first semester. The temporary advisor assists the student in selecting early course work. By the end of the first semester, the student should choose Research Director who will serve as chair of the Dissertation Committee. This Research Director will then work with the student to select additional members of a Dissertation Committee, consistent with the guidelines below. The Dissertation Committee helps the student develop a doctoral plan of study and is available to provide general assistance to student during her/his course work. The dissertation committee is also responsible for administering and evaluating the comprehensive examination and dissertation defense.

Students may elect to change the composition of their dissertation committee at any time, but they must obtain written approval from the Graduate School to do so. Changes in the Dissertation Committee typically occur when a student's research interests change over time, or when a member of the original committee is no longer available to serve due to illness, retirement, transfer to another position, or other recognized reason. If changes are made in the Dissertation Committee the student must submit the "Recommendation for Doctoral Advisory/Dissertation Committee Revision" form to the Director of Graduate Studies.

Please note that within these policy statements the term "dissertation committee" is equivalent to the "advisory/dissertation committee" that is found in the Graduate School Bulletin.

1. The Dissertation Committee, consisting of at least four (4) members of the graduate faculty who agree to assist the student with the preparation of the plan of study and shall guide and examine the doctoral dissertation. At least two (2) members of each Dissertation Committee must be full members of the UNCG Graduate Faculty but other members can include associate members of the Graduate Faculty and adjuncts to the graduate faculty approved by the Graduate School. This committee will be appointed by the Dean of the Graduate School upon the recommendation of the major department Head or Dean and must be mutually acceptable to the student and all committee members. The committee chair must be from the home department, and it is recommended that where appropriate, one member be selected from the minor area of study. If at any time the Dissertation Committee decreases in number to fewer than four members, additional members of the graduate faculty must be appointed by the Dean of the Graduate School to bring the number to at least four. The student must request the appointment of this committee no later than upon completion of the first 18 semester hours of graduate courses (See Graduate Bulletin).
2. Each student chooses his/her own chairperson of the Dissertation Committee with the consent of that person and works with the chairperson in choosing the rest of the committee (Source: Doctoral Studies Report). The composition of the Dissertation Committee must be submitted to the Graduate School for formal approval. In the event that the student chooses to change the committee's

composition at a later date, formal approval must again be obtained from the Graduate School.

3. Students are permitted to have co-chairs for their Dissertation Committees. This will enable them to have junior faculty participate in their programs. In such cases, junior and senior faculty would be paired in a mentoring relationship and collaboratively direct the student's studies and/or dissertation.
4. Students who wish to change the chair of their Dissertation Committee should do the following:
 - a. Obtain a commitment from the new committee chair that s/he is willing to serve
 - b. Submit a request for a change to the Director of Graduate Studies.
 - c. Submit a request for a change using the appropriate forms to the Graduate School with the approval of the Department Chairperson or Director of Graduate Studies.

Changes in the composition of the Dissertation Committee, chair, or members must be filed with the Graduate School using the form "Recommendation for Doctoral Advisory/Dissertation Committee Revision".

5. There is no formal limit on the number of committees on which a faculty member may serve and/or chair. It is suggested, however, that faculty limit themselves to chairing no more than four (4) dissertations at a given time.

Study Plan: A Plan of Study for the doctoral degree must be outlined by the student with the consultation of the Dissertation Committee at the earliest practical time following admission of the student to the Graduate School, preferably at the end of the first semester of residence or not later than the completion of 18 semester hours. The plan must indicate the major and minor fields of study; the specific courses the student is expected to complete as a minimum requirement; and all specific core, seminar, and research requirements of the major department. A record of all graduate work the student has taken must accompany the proposed study plan. At this time the Dissertation Committee evaluates the student's qualifications to be recommended for further study in the Graduate School, further preparation for such, or withdrawal. The committee may propose prerequisite course work to be taken if it believes the student shows weaknesses that might be corrected by additional formal study. No more than 15 credit hours of independent study may be included in the Plan of Study, exclusive of the dissertation.

1. The Plan of Study must be submitted to the Dean of the Graduate School for approval. The Dean reserves the right to refer any or all Plans of Study to the Graduate Studies Committee for review and recommendation. Copies of the approved Plan of Study must be filed in the student's permanent folder in the Graduate School Office, in the department's files, with the chairman and each member of the Dissertation Committee, and with the student. Any subsequent changes in the plan of graduate study or in the subject of the dissertation must be reported to the Graduate School for approval following approval of changes by all members of the advisory/dissertation committee.
2. The Ph.D. degree in Medicinal Biochemistry does not require a minor, but if one is selected and shown on the transcript it is defined (a) in a single discipline, as a

minimum of twelve hours; (b) in multiple disciplines, as a minimum of eighteen hours with no less than six hours in three areas or nine hours in two areas (Source: Doctoral Studies Report).

3. In some instances, study completed in other institutions may be counted toward the degree, particularly work from a regionally accredited institution, representing an appropriate area of study. If the student proposes the transfer of credit from another recognized graduate school, the student's dissertation committee must recommend in writing the transfer to the Graduate School using the form "Approval to take courses to transfer into UNCG". The Graduate School will credit the work to the student's doctoral program. Transfer credit must be supported by placing an official copy of the transcript on file in the Graduate School office and the Chemistry and Biochemistry Department office.
4. Transfer credits from other institutions or programs are allowed. For details on transferring credits, please refer to the Graduate Bulletin from the Graduate School. All credit to be applied to the student's doctoral program must be no more than seven years old when the degree requirements are completed. This means that all course work to be credited to the student's doctoral program must fall within a seven-year period of time beginning with the date of the first enrollment following admission to the program. If credit to be transferred was earned before enrollment at this University the seven-year period of time commences with the beginning date of the term in which the transfer credit was earned.
5. The Plan of Study document must be completed using the format adopted by the Department of Chemistry and Biochemistry (This form is included in this handbook), which reflects all required core coursework for this area of study.
6. The Dissertation Committee must meet as a group to discuss and formally approve the Plan of Study. Students are to provide members of the committee with copies of the plan at least two weeks in advance of the scheduled meeting. It is the student's responsibility to bring to the meeting copies of required forms for approving the Plan of Study. It is the committee chair's responsibility to route the Plan of Study to the Director of Graduate Studies, who will forward it to the Graduate School for final approval. The Director of Graduate Studies also will place the approved plan in the department file.
7. All credits to be applied toward the degree in Doctoral Degree in Medicinal Biochemistry must be counted in determining the 18-month deadline for filing the Plan of Study. This would include credits taken as a special student prior to formal admission to the program and transfer credits, even though the Graduate School does not post transfer hours to the student's transcript until completion of the program. It would not include, however, courses taken to satisfy prerequisite requirements.
8. No more than one-fourth of the credits applied toward the degree may involve 500-level courses.

9. Normally no more than 9 semester hours of independent study may be taken under the direction of a single faculty member. No more than 15 semester hours of independent studies may be included in a student's plan of study. A descriptor must be provided for all independent study courses included in the Plan of Study to show the nature or focus of the study.

Research as a Priority: Most of your effort in the first semester will probably be concentrated on doing a good job in the basic course work and teaching assistant duties, if you have an assignment in the Department. By the second semester, however, you should be fully involved in research. It is very important that you take advantage of the first summer for your research if you wish to make timely progress through the program. The time required to complete the entire program depends on your own effort and aptitude, and especially on the dedication given to the research program. The average time needed to complete the degree program is estimated to be between 4-5 years. However, a few students have been able to shorten this by one summer through sustained research effort. Your assistantship is renewable each year based on satisfactory progress in the program, which includes meeting minimum GPA standards and making reasonable progress on your research.

Dissertation Proposal: All PhD graduate students are required to present and defend a research proposal to their dissertation committee within 2 years of entering the program. This proposal also constitutes your preliminary exam, both in the preparation of the written proposal, and the oral presentation and defense of the research you propose. The written proposal should be prepared in close consultation with the Research Advisor and must be circulated with the Dissertation Committee *a minimum* of one week prior to the oral defense. In the event that a failing grade is received in either the oral or written portion of the proposal, the student will be given one opportunity to repeat this requirement, as directed by the Dissertation Committee. This must be completed within six months of the unsuccessful attempt. A second failing effort on this requirement will result in dismissal from the PhD program. The student may at that time apply to enter the MS program in the department. ***Your research proposal must be approved by your Dissertation Committee before you register for CHE 799.***

Dissertation: Your written dissertation is the capstone of your program, contributing both to your broader scientific education and to the knowledge base of your discipline. Writing the dissertation is a major assimilative effort on your part, pulling together previous work and your own data and results into a coherent whole. Before writing the dissertation it is essential that you check with the Graduate School concerning its current requirements and deadlines. They will provide a packet that explains the procedures. The Departmental deadlines require that the student submit a final draft to the dissertation committee at least 10 days before the oral exam and no later than 24 days before the Graduate School deadline. The oral exam should be no later than 14 days before the Graduate School deadline. This will leave enough time so that committee-suggested changes can be incorporated before running into the Graduate School time limit. It is your responsibility to meet these deadlines if you need to

graduate at a specific time. Make note that **the Graduate School makes no exception to the final deadline** for submitting the completed dissertation. If the deadline for turning in the dissertation is missed, you must register (and pay!) for additional credits and apply for graduation in a later semester.

Other regulations regarding courses: Up to nine of the required 30 hours may be taken in graduate courses in the Departments of Biology, Nutrition, Mathematics, or Physics. All courses that count toward the degree must be at the 500 level or above and at least 15 semester hours of credit must be at the 600 level. Subject to approval by the Department Head and the Graduate Director, students may transfer credits from other accredited graduate institutions or programs. For details on transferring credits, please refer to the Graduate Bulletin from the Graduate School. Transferred courses should not have been used to complete requirements for a previous degree, although where appropriate, this can be waived by the Dissertation committee and Director of Graduate Studies. Courses that need to be taken to make up undergraduate deficiencies cannot be applied to the graduate degree.

Undergraduate Deficiencies: Students who show a deficient background or low performance in an area will be required to take remedial undergraduate course work in the particular area of weakness before attempting the graduate core course. In this case, the student will register for the undergraduate course on a credit basis and will be required to earn at least a B to be eligible to continue in the graduate program. This applies to students without chemistry or biochemistry majors and to chemistry and biochemistry majors who are deficient in certain undergraduate courses, as determined by the Graduate Committee.

Minimum Academic Performance: An overall grade point average (GPA) of 3.0 in graduate course work must be maintained in order to complete the degree. A student who receives any of the following is academically ineligible to continue in Graduate School: C's in 9 semester hours; one F and C's in 6 semester hours; or F's in 6 semester hours. In addition, the Graduate School will not renew assistantships and tuition waivers for a student whose GPA has fallen below 3.0. **All course requirements in the approved program of study must reflect grades of "B" or better.**

Time Limit:

1. All requirements for the doctorate, including the dissertation, must be completed within seven academic years from the date of the first course accepted on the student's approved Plan of Study. Post-master's (or equivalent) credit that is to be applied to the student's doctoral program must be no more than seven years old when the degree requirements are completed. This means that all course work to be credited to the student's doctoral program must fall within a seven-year period of time. If credit to be transferred was earned before enrollment at this University, the seven-year period of time commences with the beginning date of the term in which the transfer credit was earned.
2. When a student wishes to request an extension of the 7-year time limit for fulfilling his/her doctoral degree requirements the following steps should be taken:

- a. The student completes a copy of the form Extension of Time Limits. Make sure to provide in detail all requested information, including a detailed timeline for completion of remaining requirements. The form is on the next page.
- b. The form is to be reviewed by the student's committee chair, and full committee, if desired by the chair, and a recommendation provided.
- c. The advisor sends the form to Doctoral Director of Graduate Studies, who sends his recommendation with the materials to the Graduate School.
- d. The Graduate School will notify the student and committee chair of the action taken in response to the request.

MEMORANDUM

TO: Associate Dean of the Graduate School

RE: Extension of time limits for:

(Student) _____

(Degree) _____

Entry date (first semester of courses credited toward degree):

Original date for completion: _____

Requested extension date for completion (semester,
year): _____

TIMETABLE: On a separate page, please list all remaining requirements, e.g., course work, formal dissertation proposal, completion of research, submission of chapters, oral examination, deposit of thesis/dissertation in Graduate School, graduation date, etc., and precise, anticipated dates for completing each. You may wish to refer to the calendar in the Graduate Bulletin in order to coordinate your plans with official deadlines.

Advisor/Dissertation Chair's Recommendation with Signature and Date:

Director of Graduate Studies or Department Head's Recommendation with Signature and Date:

Residence Requirement: The equivalent of a minimum of six (6) full semesters of work beyond the bachelor's degree is required for the doctorate. Doctoral candidates are expected to satisfy a residence requirement, which provides them the opportunity for an extended period of intensive study and intellectual professional development among a community of scholars. The basic residence requirement is two consecutive full-time semesters of graduate work on this campus after admission to a doctoral program. The two sessions of summer school count as one semester. Therefore, consecutive fall-spring, spring-summer, or summer-fall semesters can be counted for residency if at least six (6) credits were completed satisfactorily in each consecutive semester. Undergraduate courses taken in support of a graduate program cannot count towards residence (Source: Graduate School Bulletin/ <http://www.uncg.edu/grs/bulletin/>).

Doctoral Checklist

Important milestones for completing the doctoral program in Medicinal Biochemistry are outlined below in chronological order. Additional information related to each of these items can be found elsewhere in this handbook and the following Graduate School website (<http://www.uncg.edu/grs/> & <http://www.uncg.edu/grs/forms.html#ads>).

_____ **Work with the Director of Graduate Studies to select initial coursework for a plan of study.** Your selection of courses for a plan of study is the first step, followed by your comprehensive exams and your dissertation. While most students have the same committee members for both phases, you may change committee membership at any time.

NOTE: A residency requirement of two consecutive full-time semesters of graduate work on this campus must be met after admission to the doctoral program. See definition of residency requirement in this handbook

_____ **Form a Dissertation Committee** when you have completed 6-12 hours. Must be done no later than upon completion of 18 semester hours. Choose chairperson of the committee in your first semester and work with this person to select the rest of the committee.

Submit the form "Recommendation for Doctoral Advisory/Dissertation Committee Appointment" to the Graduate Director for routing to the Graduate School (<http://www.uncg.edu/grs/forms.html#ads>).

NOTE: Membership on the dissertation committee may be changed at any time. When changes are made the form "Recommendation for Doctoral Advisory/Dissertation Committee Revision" should be submitted the Graduate Director.

_____ **Develop a Doctoral Plan of Study** when you have completed 12 hours

Consult with the dissertation committee no later than upon completion of 18 semester hours.

Submit the cover form "Doctoral Plan of Study" along with a copy of the written plan prepared in accordance with the outline shown on the form "Format for Preparing the Plan of Study" to the Graduate Director for routing to the Graduate School. This form is included in this handbook as the final page.

If transfer credits will be involved, complete the form "Approval to Take Courses for Transfer" (from the Graduate School).

NOTE: Revisions in the plan of study can be made at any time with the approval of the dissertation committee. When changes are made, the form "Doctoral Plan of Study Revision" (<http://www.uncg.edu/grs/forms.html#ads>) should be submitted to the Graduate Director for routing to the Graduate School. The Graduate School only has the

revision to a plan of study form: The initial form for the Doctoral Plan of Study is developed by the department and is included in this Handbook.

_____ Complete all course requirements in the approved program of study.

Please download a copy of the Graduate School Bulletin for information about any of its policies. It is located at <http://www.uncg.edu/grs/bulletin/> and it is your responsibility to follow its guidelines regarding your doctoral studies.

_____ Prepare a dissertation proposal

Developed in consultation with the advisory/dissertation committee.

Must be unanimously approved by the advisory/dissertation committee.

File the Dissertation Topic Approval form <http://www.uncg.edu/grs/forms.html#ads> and submit to Dr. Norman Chiu, Director of Graduate Studies.

_____ Pass the written doctoral preliminary examination (comprehensive exam). This consists of a written research proposal in NIH style based on your proposed dissertation research.

All provisions, incompletes, or special admissions conditions must be removed.

A minimum of three-fourths of coursework must be completed.

All research requirements must be completed.

_____ Pass the oral portion of the doctoral preliminary examination (This is an oral presentation of your proposal to an open audience, followed by a defense of this research in the presence of your committee.

Complete the form "Results of Doctoral Preliminary Examination" and file with the Graduate School (<http://www.uncg.edu/grs/forms.html#ads>). There is only one form for the written and oral doctoral preliminary examination. It needs to be given to Dr. Norman Chiu, Director of Graduate Studies.

_____ Apply for admission to candidacy

All courses must be complete, preliminary and oral exams passed, and dissertation proposal approved. Complete the form "Application for Admission to Candidacy" and give to Director of Graduate Studies (<http://www.uncg.edu/grs/forms.html#ads>).

_____ Complete dissertation and oral defense successfully

Please check on the date for the last possible defense of your dissertation. Allow yourself at least one week prior to this date because revisions to your dissertation may be required.

The dissertation must be given to the dissertation committee at least two weeks before the defense.

The chair of the dissertation committee will inform the Graduate School of the title, date, time, and location of the oral examination at least two (2) weeks prior to the examination. This form is called "Results of Oral Examination in Defense of Thesis/Dissertation".

The Graduate School will publish this information, as the oral examination is open to all members of the University community who wish to attend. The committee approves the dissertation as being ready for oral defense by completing the form "Final Doctoral Oral Defense". The committee chair reports the results of the defense to the Graduate School in a memo.

Checklist of Forms

To graduate with a PhD in Medicinal Biochemistry, the following forms (available at <http://grs.uncg.edu/forms/>) must be completed. All forms must be completed by the student and approved by the Chair of Dissertation Committee and Director of Graduate Studies before the student submits the forms to the Graduate School. Additional forms that may be required in unique cases (i.e. application for transfer of graduate credit), can also be found on the Graduate School website. Please retain copies of all completed forms. It has often happened that critical forms are missing (i.e. lost during processing) when needed for graduation. It is the student's responsibility to ensure that all forms are properly filled out, signed, and submitted to the Graduate School according in compliance with the appropriate deadlines below.

| Form | Due Date |
|--|--|
| Doctoral Advisory/Dissertation Committee and Plan of Study (Plan of study must be attached to this form.) | Should be submitted before the completion of 18 credit hours of graduate courses. |
| Dissertation Topic Approval | To be submitted once the dissertation proposal is successfully defended. <i>Bring a copy of this form to your dissertation proposal defense</i> |
| Results of Doctoral Preliminary Examinations | Must be submitted once the dissertation proposal (written and oral) is successfully defended. <i>Bring a copy of this form to your dissertation proposal defense</i> |
| Application for Admission to Candidacy | Submitted once all coursework is complete, typically at the time of completion of dissertation proposal defense. <i>Bring a copy of this form to your dissertation proposal defense.</i> |
| Final Oral Examination Schedule | Submitted to the graduate school 2 weeks prior to the dissertation defense |
| Results of Oral Examination in Defense of Thesis/Dissertation | To be signed and submitted directly following successful completion of the dissertation defense. <i>Bring a copy of this form to your dissertation defense</i> |
| Dissertations with Multiple Authors | Required only for situations where dissertations or dissertation chapters are co-authored. Should be submitted along with the final dissertation. |
| Application for graduation | Within 7 days after the start of classes in the term in which the student intends to graduate |

General Departmental Information

Building Keys and Security: All full-time graduate students are issued the graduate master key, which is an Intellikey for the front door, all corridor doors and rooms 249 (teaching/tutoring room), and 347 (instrumentation room). Within a few days of receiving your Intellikey, you must activate it by testing it in all the doors listed. If you do not do this within the required time, the key will expire and you will need to go across campus to the Physical Plant building to have the key initialized again. Notice that most student Intellikeys are set to expire after one year, so you should make plans to request a renewal before this time to avoid an unexpected loss of access to the building.

Full time grads will also receive a regular key that can open rooms 215, 216, 220, 221, 222, 230, 247, and 413. These are the general chemistry laboratories, one organic chemistry laboratory, and the lounge outside the TA office (room 249).

After beginning your research you will be issued keys to rooms needed for your research activities on request from your research director.

Please note that ***the Department requires a \$25 refundable deposit for each key issued.*** The deposit must be paid in the main office of the Department (room 435) before keys will be ordered for you. You will receive your deposit back at the time you turn in the keys that have been issued to you.

The matter of building security is of special concern for us, so when you use the building at night, we ask that you are especially careful to see that your area is locked securely when you leave. Be sure doors are firmly closed and the lock engaged. If you notice other rooms open and nobody around, we would appreciate it if you would secure these as well. When one considers the types of equipment and chemicals we have in our area in terms of cost and potential hazard, we have a special responsibility to do what we can to prevent access that could have serious consequences.

Safety Procedures: You are aware of the necessity for safety in the lab. Here are some important reminders:

- Be sure to wear safety glasses or goggles whenever working in the lab.
- Gloves should be worn when handling noxious chemicals.
- Search out the safety equipment in your research area and the lab where you teach – safety showers, eye wash fountains, fire blankets, first-aid kits, fire extinguishers, alarm boxes, and red-phones to call campus police.
- Wear appropriate shoes. Do not wear open-toed shoes (sandals) of any sort.
- No food or drink is allowed in any laboratory!!

This last rule about no food or drink in the labs is extremely important since the Department can be found in violation of federal safety rules if it is not followed.

Visitors who are not doing research should be kept to a minimum in the research labs. This includes students who you might be teaching or tutoring. It is best to work with students in a classroom or the graduate office area, not in the research lab, to avoid any danger to them or distractions for your coworkers. Finally, the Science Building is a smoke-free facility, as are all buildings on campus.

Procedures for Chemicals and Equipment Checkout: In view of the high cost of chemicals and equipment and the budget within which we work, we need to minimize any unnecessary waste. Also, the Department must keep track of what is used to maintain good inventory control on our chemicals and equipment and to avoid sudden shortages. For these reasons, you must sign out for all items taken from the Stockroom. There are two separate lists, one for chemicals and one for glassware and supplies. Please talk with the Stockroom Manager about the procedure before using the Stockroom items.

To meet State requirements, access to the Chemical Stockroom is restricted as much as possible and a key to this area is not included in your master key. This means that you will not be able to check out chemicals after 5 pm or on weekends. Therefore, be sure to plan ahead and pick up needed chemicals and equipment during normal working hours. See the Stockroom Policies sheet for more details.

It is important to remember, when receiving chemicals or supplies that have been ordered for your research, to give the packing slips to the Department Secretary. Packing slips are used to notify our Accounting Department that the merchandise has been received and to authorize them to pay the related invoice.

Use of Copiers: Graduate students may make copies of materials directly related to their research ***with the exception of dissertation and dissertation drafts*** free of charge on the Departmental copier located in Room 413. If it is necessary to make a large number of copies, please check with your research director first. No copying of personal material is allowed. Please see the enclosed photocopying policy for more details. Before you use the machine for the first time, please check with the Department Secretary for instruction. You may also make free copies of material in Jackson Library, but to do so you must check out the Department Copy Card from the Department Secretary.

Please be cognizant of copyright laws. One copy of an article for personal use is generally permitted. Entire books, or even large portions of books, are not to be copied.

Graduate Offices: Graduate students should initially set up office space in Room 249. After the student chooses a research director and begins laboratory work, it is usually possible, but not necessary to move and set up new office space in the research area.

Office space in Room 249 may also be kept for meeting with students from your teaching labs.

Mail: A mailbox will be assigned to you located just outside of Room 227. You may use this to receive mail addressed to you at the Department of Chemistry and Biochemistry. We ask you to check your mailbox every day since we will communicate important Departmental matters to you in this way.

Pay Dates for Graduate Assistants: If you are receiving a graduate or teaching assistantship from the department, your assistantship stipend checks for the first academic year and first summer sessions (10-1/2 month appointments) will be issued in ten equal installments, the first of which will be on September 30, the remaining ones on the last day of each of the following nine months through June 30. The appointment for the second year is for a full 12 months (July 1 to June 30). Those who have assistantship appointments can usually make arrangements with the Cashier's Office to have tuition and fees paid by payroll deduction. It is best to arrange this as early as possible before the semester begins.

**STUDY PLAN for Graduate Students
PhD in Medicinal Biochemistry**

Name _____ Student ID _____

Name of Research Advisor: _____

This form must be approved by the Director of Graduate Studies and submitted to the Graduate School in the second semester of the program. The research director should verify each entry. The student, the research director, and the Director of Graduate Studies should have copies. Please see the Medicinal Biochemistry Doctoral Handbook for specific policies on coursework requirements.

Academic

| | | | | | | |
|-------------------|--------------|-----------------|--|-------------------|--------------|-----------------|
| <u>Cred. hrs.</u> | <u>Grade</u> | <u>Semester</u> | | <u>Cred. hrs.</u> | <u>Grade</u> | <u>Semester</u> |
|-------------------|--------------|-----------------|--|-------------------|--------------|-----------------|

Introduction to Graduate Research (required)

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| 691 | __1__ | _____ | _____ |
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Core Courses (Any two of the following)

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| 656 | _____ | _____ | _____ |
| 659 | _____ | _____ | _____ |
| 658 | _____ | _____ | _____ |
| 651 | _____ | _____ | _____ |
| 660 | _____ | _____ | _____ |

Research Problem (780)

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Electives (at least 12 credit hours):

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Dissertation (799)

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Seminars :

Introduction:

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| 401 | Audit | __X__ | _____ |
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Literature seminar:

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| 751 | __1__ | _____ | _____ |
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Dissertation seminar:

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| 752 | __1__ | _____ | _____ |
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