

POLICIES AND PROCEDURES

For The Graduate Program in
Biochemistry and Molecular Biology

CONTENTS

I.	<u>General Information</u>	3
	A. Introduction.....	3
	B. Biochemistry and Molecular Biology Graduate Committee.....	3
	C. Application for Graduate Study	3-4
	D. Vacation Policy	4
II.	<u>Information for First Year Students</u>	5
	A. Advisors and Research Rotations for new Students	5
	B. Selection of Dissertation Advisor	6
	C. Graduate Advisory Committee.....	6-7
III.	<u>Graduate Curriculum in Biochemistry and Molecular Biology</u>	8
	A. Research Requirement	8
	B. Course Requirements	8-10
	C. Transfer of Graduate Coursework.....	10
IV.	<u>Admission to Candidacy for Doctoral Degree</u>	11
V.	<u>Doctoral Dissertation</u>	12
	A. Dissertation Requirements	12
	B. Dissertation Defense	13
VI.	<u>Academic Performance</u>	14
	A. Grade Point Average.....	14
	B. Progress Evaluations	14
	C. Student Appeal Policy.....	14-15
VII.	<u>Appendix</u>	
	Student and Advisor Checklist	
	Graduate Student Research Orientation Form	
	Research Rotation Request 1st, 2nd & 3rd	
	Research Rotation Evaluation	
	Graduate Student Absence Form	
	Mid-Year Graduate Student Progress Report	
	Annual Graduate Student Evaluation Form	
	Appointment of Student's Graduate Advisory Committee	
	Approval of Graduate Student's Program of Study	
	Results of Doctoral Candidacy Examination	
	Competency Report	
	Doctoral Candidacy Examination Report	
	Report of Defense of Ph.D. Dissertation & recommendation to award the degree	
	Report of Final submission of Dissertation	

I. GENERAL INFORMATION REGARDING THE GRADUATE

PROGRAM IN BIOCHEMISTRY AND MOLECULAR BIOLOGY

A. Introduction

This booklet defines the guidelines and policies governing the Doctoral Program in the Department of Biochemistry and Molecular Biology, East Carolina University and is supplemental to the current University Graduate Bulletin. The information has been prepared for the graduate faculty, graduate students and applicants to the graduate program in Biochemistry and Molecular Biology. All faculty and students should be thoroughly familiar with the information provided, and should adhere to these policies and procedures in formulating the student's program of education.

B. Biochemistry and Molecular Biology Graduate Committee (BMBGC)

This committee of the Faculty of the Graduate Program in Biochemistry and Molecular Biology is responsible for implementation and management of the graduate program, as described in this pamphlet, and for formulating new or amended policies and practices that are subject to approval by vote of the graduate faculty. The BMBGC shall consist of at least three members who are appointed annually by the Departmental Chairman.

The BMBGC will report at each Biochemistry and Molecular Biology Faculty Meeting. These reports will be to make the Graduate Faculty aware of all Biochemistry and Molecular Biology graduate students and their progress; and to discuss and act on policy changes. New policies formulated by BMBGC become binding only after they have been approved by two-thirds of the departmental graduate faculty.

C. Application for Graduate Study in Biochemistry and Molecular Biology

Admission to the graduate program in the Department of Biochemistry and Molecular Biology requires recommendation by the BMBGC, and approval by the Departmental Chairman. Preference is given to applicants who present academic potential for biochemistry as demonstrated by their previous academic achievement and Graduate Record Examination scores. Selections are made after consideration of individual qualifications and availability of facilities and resources. Final admission to the graduate program is granted by the Dean of the Graduate School.

Admission requirements for graduate studies in Biochemistry and Molecular Biology are flexible; however, a knowledge of general and organic chemistry, biology, college physics, and mathematics through calculus are considered essential to pursue advanced studies. Students are encouraged to acquire a knowledge of analytical chemistry, statistics, and computer science. Specific requirements for admission to the graduate program are given in the University Bulletin. It is the general expectation of this graduate program that applicants enrolled in another program are expected to complete their current program prior to matriculating into our program. Students from other Departments in the School of Medicine, must obtain permission in writing from the BMBGC.

Applicants may apply for admission to begin studies in either the second summer session or the fall semester of the academic year. Application for admission to the Graduate Program is made

on forms furnished by the Graduate School office which can be downloaded from the world wide web (http://www.ecu.edu/gradschool/ecuhtm_files/appinfo.htm). Applications must be supported by official transcripts from each institution attended since high school, an official copy of Graduate Record Examination scores, at least three letters of recommendation from persons able to assess the applicant's potential as a research scientist, and an essay (1-2 pages) from the applicant describing their future career goals. Foreign applicants who do not use English as their native language must take the "Test of English as a Foreign Language (TOEFL)" examination and should achieve a score of 600 or higher. Inquiries regarding admission to the graduate program in Biochemistry and Molecular Biology should be referred to the chairman of BMBGC for processing.

D. Vacation Policy

Graduate students receive 10 working days of vacation, in addition to the 12 holidays given to state employees each year. Prior to taking vacation leave, graduate students must complete a Graduate Student Absence form (see Appendix) and give the form to their Advisor for approval and then to the Departmental office manager.

II. INFORMATION FOR FIRST YEAR STUDENTS

A. Advisors and Research Rotations for New Students

During the process of selecting potential research rotations (see below), the Chairperson of the Biochemistry and Molecular Biology Graduate Committee will serve as temporary advisor to all students whom have not chosen a Dissertation Advisor.

During the first year of study, students without a masters degree will conduct research rotations with graduate faculty members whose research areas are of interest. These research rotations provide students with the opportunity to work closely with faculty to gain laboratory experience in a field of their choice. During the first semester following entry into the doctoral program, new students meet with departmental faculty members in order to become apprised of research opportunities in the faculty member's laboratory. Students should have each faculty member sign the "Graduate Student Research Orientation" form after they have met with the faculty member. After meeting with the faculty, students will select research rotations. The Chair of the BMBGC will be responsible for assisting each student in the selection of proposed research rotations. Following this, students will submit the Research Rotation Request form to the BMBGC identifying the proposed mentor and an alternate for the first laboratory rotation. Assignment of rotations is made by the Departmental Chairman on the recommendation by the BMBGC. Following approval by the BMBGC and Departmental Chairman, each student will enroll in the approved faculty member's section of BIOC 7330 Introduction to Research for 3 credit hours per rotation and will spend a minimum of 20 hours per week in the laboratory for a semester. At the completion of each research rotation, student and advisor will complete the appropriate sections of the "Research Rotation Evaluation" form (see Appendix) which will become a part of the student's departmental file. Students may also be required to make a brief oral presentation on the work accomplished in their rotations. During the latter half of the first rotation, students will identify two proposed research rotations for the two summer sessions. Students will be expected to spend full time on research during the summer rotations. With the approval of the BMBGC, students may take a fourth research rotation in the spring semester if a dissertation mentor has not yet been chosen. BIOL 7230, 7231 (Biotechniques and Laboratory) or BIOL 6250, 6251 (Protein Purification Techniques) may be substituted for the first rotation)

Students who enter the Biochemistry and Molecular Biology Graduate Program with a masters degree, **may** elect to choose a dissertation advisor during the fall semester, and thus start their dissertation research in the spring semester.

B. Selection of a Dissertation Advisor

Following the completion of at least three research rotations or the completion of a masters degree, a Dissertation Advisor will be selected by the student. The Chair of the BMBGC will be responsible for assisting the student in selecting a Dissertation Advisor appropriate to the research interests and professional goals of the student, and consistent with the resources of the proposed Dissertation Advisor and the Department.

All full time students in the graduate program in Biochemistry and Molecular Biology should have a Dissertation Advisor no later than spring semester of their second year. In the event that a student does not have an Advisor at this time, the BMBGC will recommend an Advisor to be assigned by the Departmental Chairman after consulting with the BCG. The assignment should be mutually agreeable to the student and to the Advisor.

Upon selection of an Advisor the student will notify the BMBGC of his/her choice in writing. The faculty member selected as Advisor will concurrently notify the BMBGC in writing of his/her willingness to assist the student and to accept the responsibility of directing the doctoral dissertation. After reviewing the request, the BMBGC will make a recommendation to the Departmental Chairman who shall make the appointment. To change the Advisor-Advisee relationship, a written recommendation from the BMBGC and consent of the Departmental Chairman is required.

C. Graduate Advisory Committee

Within the semester of appointment, it is the responsibility of the Departmental Chairman to appoint the members of the student's Graduate Advisory Committee. The student's Advisor will normally serve as the Chairman of the student's Graduate Advisory Committee. This Committee is composed of at least four graduate faculty members. Three of these must be members of the Graduate Faculty in Biochemistry and Molecular Biology (at least two of whom must be fiscal members of the Department of Biochemistry and Molecular Biology). At least one Committee member must be a member of the Graduate Faculty of another Department.

The student's Graduate Advisory Committee is responsible for establishment of the student's program of study in final detail, approval of the research program, counseling the student, monitoring student's progress, and administration and evaluation of the dissertation defense. The final program of study for the Ph.D. degree shall be formulated and approved by the student's Graduate Advisory Committee (in consultation with the student) and must be reviewed by the BMBGC which, in turn, will forward the final program to the Departmental Chairman for approval. It is recommended that the program of study be submitted as early as possible in the first semester after assignment of the Advisor.

The student's Graduate Advisory Committee **must** meet at least twice a year. One of these meetings shall be held immediately after the student presents their research results in the Student Seminar Series in the spring semester. The student generally should be present for at least a part of all meetings. The chairman of the Advisory Committee **will submit** a written summary of each meeting to the BMBGC and provide copies to the student and to each committee member. At least once a year this report shall include a description of the overall achievement and development of the student. This report will be forwarded to the Departmental Chairman by the BMBGC and kept in the student's permanent file.

If the Advisor leaves this institution, the Advisor and the student's Advisory Committee must insure that the student's progress toward the degree can continue at this or another institution. If the Advisor goes on sabbatical or becomes incapacitated, another faculty member must assume the role of Acting Chairman of the Advisory Committee with the approval of the BMBGC and the Departmental Chairman.

Responsibilities of Student's Advisory Committee Members in the BSOM

The Dissertation Advisory Committee is usually formed from members of the graduate faculty in accord with Departmental or Interdisciplinary Program policies. Through its regular meetings, the committee is responsible for evaluating research skills with respect to the student's potential for independent and creative research. Each committee member bears a responsibility to the student and to East Carolina University for maintenance of academic standards within the graduate school. The committee should also assure that there is consistency in standards and expectations among graduate students. To achieve these objectives, committee members are expected to regularly provide critical evaluation of the student's research and advocate for progress toward completion of an independent research project. Each committee member has a responsibility to attend all committee meetings (at least 2/yr), and to present the student with a critical evaluation of the dissertation prior to the final examination.

The following are specific expectations for Dissertation Advisory Committees at the Brody School of Medicine. Individual Departments or Interdisciplinary Programs may have additional expectations.

1. Approve the student's dissertation project.
2. Provide on-going critical advice to the student on his/her research project.
3. Critically evaluate the student's progress and performance including approval of semi-annual written documentation.
4. Critically advise the student on the development of the dissertation to its final form.
5. Approve the dissertation prior to the scheduling of the defense.
6. Administer and evaluate the dissertation defense.
7. Encourage the student's professional development through sponsorship of membership in professional societies and communication of research findings at professional meetings and in publications.

III. GRADUATE CURRICULUM IN

BIOCHEMISTRY AND MOLECULAR BIOLOGY

A. Research Requirement

All graduate students in Biochemistry and Molecular Biology are required to conduct an original, independent research project under the supervision of their Advisor. The research project is a major component of the graduate curriculum. A dissertation reporting the results of the investigation in relation to the existing scientific knowledge must be written. The student will be expected to present portions of the dissertation research at regional, national or international scientific meetings, such as the FASEB, Gordon Conferences, ACSM, etc., in addition to the preparation of at least one manuscript which the student's Advisory Committee deems worthy of submission to a suitable refereed journal.

B. Course Requirements

Students in the Graduate Program in Biochemistry and Molecular Biology must meet all requirements specified in their approved program of study in order to obtain a degree. However, the student's Graduate Advisory Committee can elect to alter the approved program requirements when such changes are beneficial to the student. Recommended changes in the program of study must be submitted in writing to the BMBGC for review and forwarded to the Departmental Chairman for approval.

All doctoral programs of study must include the following (or provide evidence of having successfully completed equivalent courses): Biochemistry I (BIOC 7301); Molecular Biochemistry (BIOC 7310); Biochemistry II of Metabolism (BIOC 8320); Molecular Biology of the Cell (MCBI 7410); Advanced Molecular Genetics (MCBI 7448); Ethics and Research: Humanities and Basic Medical Sciences (HUMS 7004); and a minimum of 4 credits in Seminars in Biochemistry and Molecular Biology (BIOC 7335). Students are expected to attend departmental seminars throughout their course of study whether or not they are enrolled for credit in any given semester. Additional credits in graduate courses chosen from the Department of Biochemistry and Molecular Biology including Dissertation Research (BIOC 9000) as well as courses from other departments' offerings are required for a total of 58 credits. Maximum credit for BIOC 7330, Introduction to Research, is limited 13 credits, BIOC 7355, Topics, to 12 credits, and BIOC 7335 Seminars, to 8 credits. Students may enroll for more than the maximum credits for these courses and these will appear on the transcript; however, the above limits will be used to determine the 58 credits for the degree and for calculating grade point averages required to remain in good standing in the Department. The details of an individual student's approved program of study are the responsibility of the student's Graduate Advisory Committee. A typical program for the first two years of study in Biochemistry and Molecular Biology Graduate Program follows:

Title	Subject	No.	Hours
Fall, First Year			
Biochemistry I	BIOC	7301	4
Molecular Biochemistry	BIOC	7310	3
Molecular Cell Biology	MCBI	7410	4
Introduction to Research	BIOC	7330	1
Seminar in Biochemistry	BIOC	7335	1
Spring, First Year			
Biochemistry II	BIOC	8320	4
Introduction to Research	BIOC	7330	3
Seminar in Biochemistry	BIOC	7335	1
Advanced Molecular Genetics	MCBI	7440	4
1st SS, First Year			
Introduction to Research (not registered)	BIOC	7330	3
2nd SS, First Year			
Introduction to Research (not registered)	BIOC	7330	3
Fall, Second Year			
Introduction to Research	BIOC	7330	3
Seminar in Biochemistry	BIOC	7335	1
Hybridoma Technology	MCBI	7453	2
Spring, Second Year			
Current Topics	BIOC	7355	1
Seminar in Biochemistry	BIOC	7335	1
Introduction to Research	BIOC	7330	3
Physiological Proteogenomics	PHYL	7704	4

In all semesters after the first two years graduate students will register for 3 credit hours of Dissertation Research (BIOC 9000), 1 credit hour of Seminar in Biochemistry (BIOC 7335), and 1 credit hour of Current Topics (BIOC 7355).

As a general rule graduate students in biochemistry and molecular biology are expected to develop a working knowledge of radiation safety and laboratory safety. Students are also expected to acquire a working knowledge of the use of microcomputers, finding information on the internet, and the principles of statistics. An individual student's program of study must include either formal or informal studies to provide the knowledge required. The Graduate School requires that candidates for the Doctor of Philosophy degree demonstrate proficiency in foreign languages, statistics or computer science (the "research skills" requirement). A working knowledge of statistics and computer literacy, both appropriate to the student's research interests, constitute the Research Skills requirements of the Department of Biochemistry and Molecular Biology. Certification from the student's Graduate Advisory Committee to the Graduate Program Committee that the student has successfully acquired these skills must be made to the Graduate Program Committee prior to the dissertation defense.

C. Transfer of Graduate Coursework

Graduate work completed prior to the admission to doctoral program will be evaluated by the BMBGC. Transfer of credit is subject to further approval by the Departmental Chairman, and the Dean of the Graduate School. With the approval of the BMBGC and Departmental Chairman, the doctoral candidacy examination requirement **may** be waived for transfer students who have successfully passed an equivalent candidacy examination in their former graduate program.

IV. ADMISSION TO CANDIDACY FOR THE

DOCTORAL DEGREE

Doctoral students must successfully pass the doctoral candidacy examination. A student's eligibility for the examination will be determined by the Biochemistry and Molecular Biology Graduate Committee. This examination will address the student's originality and ability to design a research study in the area of his or her dissertation research. Upon passing this examination the student will be recommended for admission to candidacy for the degree, Doctor of Philosophy. This examination needs to be completed by the end of June of the second year. Deviations from this time table must be approved by the BMBGC.

Candidacy Examination

The candidacy examination will require the student to compose a research proposal, prepared in the format of a National Institutes of Health or National Science Foundation grant application. The area of research proposed should be in the area of their proposed dissertation research. The budget pages need not be completed. The final version of the grant application will be submitted to the examination committee for approval. Once the application is approved it is to be presented in the form of a seminar. The seminar should be 15 - 30 minutes and length. The seminar portion of this examination is open to all members of the biochemistry department including other graduate students. Following the seminar, the student will meet with the Examination Committee and any other biochemistry graduate faculty with the exception of the student's mentor, in a session at which time the student will defend their grant application and the scientific principles upon which it is based. The Examination Committee will be appointed by the BMBGC and consist of at least four members of the graduate faculty of the Department of Biochemistry and Molecular Biology.

Any biochemistry faculty member with the exception of the students mentor may attend and participate in the grant application defense. All faculty members that participate shall also be involved in the evaluation of the student's performance on this examination. Approval of the student's performance will be by a roll call vote of all faculty in attendance with no abstention. A passing vote consists of no more than one negative vote. The student's Examination Committee Chairman will be responsible for submitting the forms: "Results of Doctoral Candidacy Examination" and "DOCTORAL CANDIDACY EXAMINATION REPORT" (see Appendix) to the BMBGC.

V. DOCTORAL DISSERTATION

A. Dissertation Requirements

Following the requirements of the Graduate Catalog of East Carolina University, each Candidate shall prepare a dissertation proposal. The dissertation proposal should meet the guidelines specified in The Graduate Catalog, Section 7, School of Medicine, Doctoral Dissertation:

- 1) A review of the literature pertinent to the research,
- 2) A short statement on the nature of the project and the objectives of the proposed research,
- 3) An outline of a feasible research program.

The dissertation proposal must be approved by and may be changed as needed by the student's Graduate Advisory Committee.

The dissertation must reflect original, independent research, which contributes new knowledge to the candidate's major field. A high quality of experimental design, research technique, and communication must be demonstrated along with a clear perception of historical foundations, strengths, weaknesses, and implications of the results.

The student will write a dissertation under the direction of his/her Advisor. With the Advisory Committee's approval, the student will submit a complete typed draft of the dissertation to each Advisory Committee member. The Committee will have a minimum of 2 weeks to critique the dissertation draft and return it to the student. Each committee member shall convey to the student's Advisor whether the dissertation is of sufficient quality to schedule the oral defense. The student will prepare and distribute a complete, revised draft that reflects consideration of the Advisory Committee's critique. Simultaneously, the Advisor shall inform the BMBGC by letter that the dissertation is ready for defense and submit an announcement of the date, time and location of the oral defense. With the written approval of the BMBGC, the announcement will be distributed to all departments in the School of Medicine and to all biochemistry faculty members. The announcement must be distributed no less than 1 week prior to the oral defense and Advisory Committee members must receive the revised dissertation draft at least 2 weeks prior to the oral defense date.

Details pertaining to the preparation, binding, and distribution of the dissertation are specified in the Graduate catalogue. Bound copies of the dissertation will be provided for the Advisor and the Department.

B. Dissertation Defense

The dissertation defense will consist of an oral presentation of the dissertation research in a publicly announced Departmental Seminar to which all interested persons are invited followed by a student Advisory Committee meeting. The candidate should successfully defend the research findings by responding to all questions and criticism. If the presentation is unsatisfactory the defense will be re-scheduled. If the research findings contain major weaknesses, the candidate will be offered an opportunity to obtain additional data before re-scheduling a defense. Immediately following the seminar, the student's Advisory Committee will convene in private to ask additional questions if deemed necessary and to vote on the student's dissertation. The vote will be recorded. Voting shall be a roll call vote with no abstention. Successful defense requires no more than one negative vote. Recommendation to the Dean to award the degree will be made by the committee and the Departmental Chairman.

The doctoral degree program must be completed before the end of the twelfth semester, excluding summers, following initial enrollment. If special circumstances require, a student may request an extension from the BMBGC with endorsement from his Advisory Committee. The BMBGC will review the request and will make a recommendation to the Departmental Chairman. Only one extension of not more than two semesters, summers included, will be approved.

The doctoral degree program is considered complete when the dissertation has been successfully defended and a copy of the signed, final version has been forwarded to the Graduate School.

VI. ACADEMIC PERFORMANCE

A. Grade Point Average

Students in the doctoral program must maintain a cumulative grade point average (GPA) of at least 3.0 for graduate courses. The GPA will be calculated in the Department based on courses in the student's program of study that do not exceed the maximum credits allowed for courses that may be repeated for credit (see III. B.). At the discretion of the student's GAC, the BMBGC, and the Department Chairman, additional course work may be added to the program of study to allow the student to bring the cumulative GPA to 3.0. A cumulative departmental GPA of 3.0 is a prerequisite for the administration of the Doctoral Candidacy Examinations. Only graduate level courses with a grade of "B" or better may be used to satisfy the minimum 58 credit hours required for the Ph.D. degree. A student can earn no more than 2 "C" grades for courses in their program of study. Any Biochemistry and Molecular Biology Course in which a student makes a "C" grade must be repeated, and a grade of B or better must be obtained.

If a student receives a grade of "F", the student must initiate a petition to continue his/her program. The petition must be approved by the student's Graduate Advisory Committee, the BMBGC and the Departmental Chairman in order to allow the student to continue in the program. If approved, the student must repeat the course and earn a grade of "B" or better before the dissertation defense. The course (credits and grade) can be counted only once for graduation.

B. Progress Evaluations

The BMBGC biannually reviews each student's progress. The reviews will consider all aspects of a student's performance. Examples of unsatisfactory performance include poor grades, non-compliance with regulations, irresponsibility, insufficient effort on dissertation research, unsatisfactory progress on writing the dissertation, scientific misconduct, and unethical behavior. If the student's progress is unsatisfactory, the BMBGC, in concert with the Advisor, may require remedial action or may request that the Departmental Chairman remove the student from the Biochemistry and Molecular Biology Graduate Program.

C. Student Appeal Policy

When a student's Research Advisory (Thesis) Committee considers a student's academic performance and/or research integrity to be unacceptable for continuance in the graduate program the committee will recommend to the Departmental Graduate Studies Committee and the Departmental Chair that the student's program be terminated (When the program is an Interdisciplinary Graduate Program the Graduate Studies Committee of the program and the program director will be notified). If all parties concur in the recommendation, the Departmental Chair or Interdisciplinary Program Director will forward the recommendation to terminate the student's program of study to the Associate Dean for Research and Graduate Studies, The Brody School of Medicine. The Associate Dean will inform the student of the recommendation and apprise the student that he/she may appeal the decision in writing to the Associate Dean for Research and Graduate Studies within seven days. Should the student elect not to appeal or does not respond, the Associate Dean will send the recommendation to terminate the student's

departmental or interdisciplinary program of study to the Dean of the Graduate School. Should the student choose to appeal the decision, the appeal will be considered by the Graduate Studies Committee of the Brody School of Medicine excluding the director of the affected department or program no later than the next regularly scheduled meeting of the Graduate Studies Committee.

Adopted: August 4, 1997
Revised July 17, 1998
Revised July 14, 1999
Revised May 8, 2001
Revised August 14, 2002
Revised August 6, 2003
Revised January 23, 2004
Revised July 25, 2006