

**GUIDELINES FOR A MS DEGREE  
IN THE DEPARTMENT OF BIOCHEMISTRY AND MOLECULAR BIOLOGY  
UNIVERSITY OF LOUISVILLE SCHOOL OF MEDICINE**

**I. GENERAL INFORMATION**

These guidelines represent the policies of the Department of Biochemistry & Molecular Biology regarding the masters (MS) program. The MS program is administered by the Graduate Executive Committee (GEC). This committee is responsible for reviewing the progress of the students and recommending changes in the program for approval by the faculty. In addition, the Department Chair, GEC, and all members of the faculty are available to assist students in their progress towards successful completion of the M.S. degree.

Students are expected to read and be familiar with all of the policies and requirements outlined herein. These guidelines are not meant to supersede the academic policies of the University as outlined in the [Graduate School Catalog](#). Students are expected to familiarize themselves with the [Graduate School Catalog](#), the policies on academic standing, the statement of student ethics, and the requirements for obtaining graduate degrees at the University of Louisville.

**II. STUDENT ADVISORS**

**A. The Director of Graduate Studies (DGS) for Biochemistry and Molecular Biology (BMB).**

The DGS will serve as the advisor for all MS students. The DGS serves as the liaison between the graduate students and the department, unit, and school. All student progress is monitored and approved by the DGS, the Graduate Executive Committee and the Chair. The DGS is responsible for approving course registration, including drop/add, each term throughout the duration of the program, and lab rotation and advisor selection requests. He/she is also responsible for notifying the School of Interdisciplinary Graduate Studies (graduate school) on student progress, e.g., MS degree application and degree completion. It is the student's responsibility to keep the DGS informed their progress. This is best accomplished through scheduled annual advisory meetings.

**B. Thesis Advisor**

Students that elect to complete a thesis-based MS will need to select a laboratory and advisor. The role of the Thesis Advisor is to serve as the primary mentor for the student throughout the duration of the program. The major responsibility of the Mentor is for research training and professional development. More information on thesis-based MS is found under IV.D Requirements for the MS Degree in Biochemistry (thesis option)

**III. MS Program Overview**

**A. The Masters Program in Biochemistry and Molecular Biology is a 2 year course of study designed for students interested in:**

1. a terminal master's degree who do not require extensive research experience or credentials, e.g. pharmaceutical representatives, medical insurance providers, medico-legal professionals;
2. combined programs to form hybrid or dual science/business or public health degrees, such as an M.S./M.B.A. or M.S./M.P.H. programs;
3. progressing through management ranks in Pharma or biotech businesses;
4. combining the scientific foundations with extensive scientific writing experience or electives as the basis for a scientific writing career;
5. gaining practical training in laboratory technique and analysis as the basis for a career in biotechnology or academic research.

## B. Program Options.

To fulfill the diverse needs of our MS students, BMB offers three MS options:

1. Non-thesis Course-based MS
2. Non-thesis Laboratory technique based MS
3. Thesis-based MS

## IV. Requirements for the MS Degree in Biochemistry

All MS students must complete 30 credit hours. This requirement can be met through coursework, seminar presentation, and research, and will depend on the program option for the student. In addition, a final summative event is required; this will be either a professional paper based on literature or laboratory research or a traditional thesis that will be evaluated by the faculty.

### A. Coursework:

BMB Course Listing

bold indicates BMB required MS courses.

#### Fall Semester:

	Course No.	Credit Hours	
Biochemistry	<b>645*</b>	<b>(4)</b>	<b>Biochemistry I</b>
	611*	(4)	Advanced Techniques in BMB Methods I
	<b>668</b>	<b>(4)</b>	<b>Molecular Biology/ Genetics</b>
	603	(1-3)	Special Topics in Biochemistry
	613	(2-4)	Lab rotation

#### Spring Semester:

Microbiology	667*	(3)	Cell Biology
Biochemistry	<b>647</b>	<b>(4)</b>	<b>Biochemistry II</b>
	612	(2)	Advanced Techniques in BMB Methods II
	603	(1-3)	Special Topics in Biochemistry
	675	(4)	Biochemistry of Cancer
	660	(2)	Molecular Endocrinology
	680	(2)	Biomolecular Interactions
	661	(3)	Molecular Toxicology
	<b>630</b>	<b>(1)</b>	<b>Responsible Conduct of Research</b>
	<b>606</b>	<b>(1)</b>	<b>Seminar</b>
	613	(2-4)	Lab rotation

1. The 30 h credit requirement will be partially fulfilled by the required courses listed above that total 14 h. The remaining 16 credit hours will be selected based on the program option.
2. The selection of courses to complete the credit requirements should be made in consultation with the DGS and the student's thesis advisor (thesis option only).
3. For students with previous graduate training, documented graduate level courses may be accepted to fulfill credit requirements. This requires approval by the Graduate Executive Committee when the student is admitted.
4. Students are expected to maintain B (3.0) averages in their course work. A student who fails to maintain a B average will be placed on academic probation for one semester and will be subject to dismissal from the program after a second semester with an average below 3.0.

### B. Other requirements

1. BIOC 606 (Seminar)

This requires a formal departmental presentation. The topic is to be selected by the student and approved by the DGS in consultation with the seminar director. The student will be advised on seminar preparation.

2. BIOC 630 (Responsible Conduct of Research)  
All students will receive mandatory training in ethics as mandated by the NIH and the University of Louisville

## **C. MS Options**

### **1. Thesis option requirements**

#### **a. Credit hours**

A total of 18 h of coursework is required for the MS thesis degree. Completion of the required courses listed above will fulfill 12 h of coursework credit. The remaining 6 h requirement can be fulfilled with electives, of which 4 credit hours must be in BIOC courses and 2 credit hours of electives inside or outside of BIOC. One semester of BIOC 611 (Advanced Techniques in BMB Methods I, 4 h) is required for a student entering the thesis-based option and who has no prior research experience.

The remaining 12 h credit requirement will be partially fulfilled with BIOC 606 and BIOC 630 (1 credit hour each), and completed with either Biochemistry lab rotation (BIOC 613), or Research (BIOC 619) hours.

#### **b. Research Proposal**

Students must present a 1-2 page research proposal to their thesis committee and orally defend that proposal during the first year.

#### **c. Thesis**

A MS research thesis is required for the thesis option. Students, with the consent of their committee, may choose between a traditional research thesis format or a thesis in which the methods and results sections are replaced by manuscripts ready for submission for publication in a refereed journal. In either case, the thesis must conform to the School of Interdisciplinary and Graduate Studies' Standards for Preparation of Theses and Dissertations.

### **THESIS COMMITTEE**

MS thesis committees shall be composed of the advisor, two other faculty of the Department of Biochemistry and Molecular Biology (at least two of the Committee members must be primary faculty in the Department), and one member outside of the Department, and must be approved by the Graduate Executive Committee.

Once an advisor has been selected and the research project is underway, the advisor in consultation with the student will submit to the GEC names of the faculty members willing to serve on the student's Thesis Committee. Committees must be approved by GEC, the Chair of the Department and the Dean of the Graduate School. The student will submit the Thesis/Dissertation Advisory Committee Appointment form signed by the Thesis committee to GEC for approval.

The role of the Thesis Committee is to help advise students on their research, evaluate research progress, and approve the final dissertation.

### **2. MS non-thesis option: laboratory-based**

#### **a. Credit hours**

Completion of the required courses listed above will fulfill 14 h of coursework credit. The remaining 16 h requirement can be fulfilled with one semester of BIOC 611 (Advanced Techniques in BMB Methods I, 4 h) and BIOC 613 (laboratory rotations). BIOC 611 is required for a student entering the laboratory-based option and who has no prior research experience.

- b. Laboratory rotations: Students are expected to spend the equivalent of up to 10 hours per week for 8 weeks learning laboratory techniques and approaches focusing on a research problem. At the end of the rotation, students present their work to the Department in a 15 minute research conference format. They will be expected to understand the background of the work, the specific goals of the project, and have an understanding of the methodological approaches and interpretation. A short written summary of the work is also required. The course is graded as P/F.  
The MS student with a lab-based options is expected to complete 4 rotations with the goal to learn diverse laboratory techniques. Selection of the lab/preceptor will be made in consultation with the DGS and approved by GEC.
- c. Summative final event  
A paper based on literature research or laboratory research (rotation research) is required. The topic will be approved by the DGS and the paper evaluated by 2 faculty.

### **3. MS non-thesis option: course-based**

- a. Credit hours  
Course requirements for students interested primarily in a course work MS include 22 credit hours of BIOC courses and 8 credit hours of electives inside or outside of BIOC. Completion of the required courses listed above (BIOC 645, 647, 668, 606, and 630) will fulfill 14 h of BIOC courses. The remaining
- b. Summative final event  
A paper based on literature research is required. The topic will be approved by the DGS and the paper evaluated by 2 faculty.

Revised July 2012

Approved by the Graduate Executive Committee  
Approved by BMB Faculty

Date: 08-01-12  
Date