

# M.S. IN BIOCHEMISTRY AND MOLECULAR BIOLOGY

## Overview

The Master of Science in Biochemistry & Molecular Biology is a full-time, 30 credit program, designed to be completed in one year. This program offers laboratory-based training in an intellectually stimulating learning environment with opportunities for students to become critical thinkers. Students are taught by faculty members who are leaders in the field of Biochemistry and Molecular Biology and span a broad area of research within the scientific community.

This program may be advantageous to those seeking:

- A gap year before applying for MD and MD- Ph.D. programs
- Hands-on laboratory & research experience
- Additional training for admission to Ph.D. programs.
- Opportunities to gain employable skills to help prepare for careers in industry

This degree may be optionally combined with a Master of Business Administration to enhance career options. The MBA portion of the sequential program may be completed in one year and consists of 44 MBA credits. The degrees must be obtained sequentially. The admission and degree process for the MBA is separate and conducted by the Miami Herbert Business School.

## Admission Requirements

Applicants to the Master of Science in Biochemistry and Molecular Biology Program at the Miller School must have a bachelor's degree from an accredited institution and sufficient undergraduate coursework in the areas of biological sciences, physical sciences, medicine, agricultural sciences, or chemical sciences.

*Competitive* candidates will have the following:

- Excellent academic record (minimum overall cumulative GPA = 3.0)
- Strong letters of recommendation
- Motivation to pursue state-of-the-art biomedical research or a career in medicine

Full application instructions can be found online (<http://biomed.med.miami.edu/apply/>).

## Curriculum Requirements

The requirements for graduation with MS degree include the following:

- Successful completion of 15 credit hours of required courses and up to 15 credit hours of research work totaling 30 credit hours.
- A final oral comprehensive examination of the research performed- A student failing the comprehensive may be allowed one opportunity to retake it if the student's committee so advises. The re-examination may not be taken during the same semester or summer session and must be taken within one calendar year.

## Research Track

Code	Title	Credit Hours
<b>Required Courses <sup>1</sup></b>		
BMB 605	Principles of Biochemistry and Molecular Biology	3
BMB 612	Medical Genetics (Course should be listed as "Human Genetics")	3
BMB 618	Scientific Communications Journal Review	2
BMB 630	Research in Biochemistry and Molecular Biology I <sup>2</sup>	3
BMB 634	Research in Biochemistry and Molecular Biology II <sup>2</sup>	6
BMB 635	Research In Biochemistry and Molecular Biology III	6
<b>Electives: Choose 7 elective credits from the list below: <sup>3</sup></b>		
BMB 602	BMB Graduate Research Seminars <sup>3</sup>	
BMB 610	Advanced Topics in Biochemistry and Molecular Biology <sup>3</sup>	
BMB 615	Structural Biology and Applications to Drug Discovery (Masters) <sup>3</sup>	
BMB 616	Basis of Mitochondrial Medicine <sup>3</sup>	
BMB 619	Epigenetic Control of Gene Expression <sup>3</sup>	
BMB 641	Essentials of Biotechniques I II <sup>3</sup>	
BMB 642	Essentials of Biotechniques II <sup>3</sup>	

BMB 644	Independent Studies in BMB Scientific Research <sup>3</sup>	
<b>Total Credit Hours</b>		<b>30</b>

<sup>1</sup> Successful completion of 15 credit hours of required courses and up to 15 credit hours of research work totaling 30 credit hours.

<sup>2</sup> Dependent on academic advisement, research credits may be adjusted between 3-6 credits.

<sup>3</sup> Students may complete 6-7 elective credits selected with the academic advisor.

<sup>4</sup> Dependent on elective selection(s), research credits may be adjusted accordingly

<sup>5</sup> Dependent on academic advisement, credits may be adjusted between 1-9 credits.

<sup>6</sup> Dependent on academic advisement, credits may be adjusted between 1-4 credits.

<sup>6</sup> Course may be repeated for credit in Fall and Spring.

## Industry Track

Code	Title	Credit Hours
<b>Required Courses<sup>1</sup></b>		
BMB 601	Research Journal Club	1
BMB 605	Principles of Biochemistry and Molecular Biology	3
BMB 614	Molecular Genetics	3
BMB 641	Essentials of Biotechniques I II	1
BMB 642	Essentials of Biotechniques II	3
BMB 680	Responsible Conduct of Research	1
<b>Electives</b>		
BMB 610	Advanced Topics in Biochemistry and Molecular Biology	3
BMB 615	Structural Biology and Applications to Drug Discovery (Masters)	3
<b>Internship</b>		
BMB 632	(Internship) <sup>4</sup>	1-9
<b>Capstone</b>		
BMB 633	Capstone project in Biochemistry and Molecular Biology	1-3
<b>Total Credit Hours</b>		<b>30</b>

## Suggested Plans of Study

### Research Track

Year One		Credit Hours
<b>Fall</b>		
BMB 605	Principles of Biochemistry and Molecular Biology	3
BMB 610	Advanced Topics in Biochemistry and Molecular Biology	3
BMB 618	Scientific Communications Journal Review	2
BMB 641	Essentials of Biotechniques I II	1
BMB 630	Research in Biochemistry and Molecular Biology I <sup>2</sup>	3
<b>Credit Hours</b>		<b>12</b>
<b>Spring</b>		
BMB 602	BMB Graduate Research Seminars	1
BMB 612 HUMAN GENETICS	Course listed as Pathobiology	3
BMB 615	Structural Biology and Applications to Drug Discovery (Masters)	2
BMB 634	Research in Biochemistry and Molecular Biology II <sup>2</sup>	6
<b>Credit Hours</b>		<b>12</b>
<b>Summer</b>		
BMB 635	Research In Biochemistry and Molecular Biology III	6
<b>Credit Hours</b>		<b>6</b>
<b>Total Credit Hours</b>		<b>30</b>

**Industry Track**

<b>Year One</b>		<b>Credit Hours</b>
<b>Fall</b>		
BMB 680	Responsible Conduct of Research	1
BMB 601	Research Journal Club <sup>6</sup>	1
BMB 605	Principles of Biochemistry and Molecular Biology	3
BMB 614	Molecular Genetics	3
BMB 641	Essentials of Biotechniques I II	1
<b>Credit Hours</b>		<b>9</b>
<b>Spring</b>		
BMB 601	Research Journal Club <sup>6</sup>	1
BMB 642	Essentials of Biotechniques II	3
BMB 633	Capstone project in Biochemistry and Molecular Biology <sup>5</sup>	4
BMB 615	Structural Biology and Applications to Drug Discovery (Masters)	3
<b>Credit Hours</b>		<b>11</b>
<b>Summer</b>		
BMB 632	Internship <sup>4</sup>	6
BMB 633	Capstone project in Biochemistry and Molecular Biology <sup>5</sup>	4
<b>Credit Hours</b>		<b>10</b>
<b>Total Credit Hours</b>		<b>30</b>