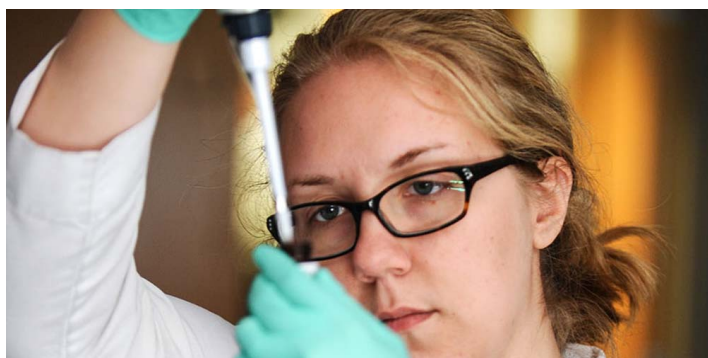


# BIOCHEMISTRY AND MOLECULAR GENETICS (MS)



## Master of Science in Biochemistry and Molecular Genetics

Unit: School of Medicine (<https://louisville.edu/medicine/>) (GM)  
 Department: Biochemistry and Molecular Genetics (<http://louisville.edu/medicine/departments/biochemistry/>)  
 Program Webpage (<https://louisville.edu/medicine/departments/biochemistry/programs/graduateprograms/>)  
 Academic Plan Code(s): BIOCMS

## Program Information

The Master of Science in Biochemistry and Molecular Genetics program is two-to-three-year course of study designed for students interested in:

- A master's of science degree leading to job opportunities in science that do not require extensive research experience or credentials, e.g., pharmaceutical representatives, medical insurance providers, scientific writing.
- Preparation for professional school, e.g., medical, dental, or legal.
- Combined programs to form hybrid or dual science/business or science/public health degrees, such as an MS/MBA or MS/MPH programs.
- Gaining practical training in laboratory technique and data analysis as the basis for a career in biotechnology or academic research.

As teachers and scientists, the faculty of the Department of Biochemistry and Molecular Genetics subscribe to the following missions:

- Provide up-to-date and high-quality classroom and laboratory instruction in the disciplines of biochemistry, genetics, and molecular biology to students at the university.
- Conduct and publish research or other scholarship in areas that advance knowledge within a discipline, contribute to improving the human condition, and contribute to teaching.
- Train pre- and post-doctoral individuals in biomedical research.

## Admission Requirements

All applications must be submitted online (<https://graduate.louisville.edu/admission/apply/>) to the Graduate School.

Only complete applications will be reviewed. A complete application must have all the following:

- Transcripts of all course work
- At least two letters of recommendation, preferably from faculty in a scientific discipline, such as biology or chemistry
- A personal statement of interest

### Selection Process

Applications will be reviewed by the Director of Graduate Studies and the Graduate Executive Committee of the department. We use a holistic review process and use the GPA and relevant experience to select applicants likely to be successful in our program.

Final decisions for admissions will be made in April-May of each year.

### Program Requirements

Code	Title	Hours
<b>Program Core</b>		<b>8</b>
BIOC 606	Biochemistry Seminar	1
BIOC 630	Responsible Conduct of Research: Survival Skills and Research Ethics	1
BIOC 645	Advanced Biochemistry I	4
BIOC 646	Nucleic acids and information metabolism	1
BIOC 649	Protein Function: from interactions to enzyme control	1
<b>Elective Courses</b>		<b>12-16</b>
BIOC 647	Advanced Biochemistry II (May be taken in place of BIOC 646 & BIOC 649)	4
BIOC 648	Journal Club in Biochemistry and Molecular Genetics	1
BIOC 661	Molecular Mechanisms of Toxicology	3
BIOC 663	High-Throughput Sequencing Data Analysis	3
BIOC 667	Cell Biology	3
BIOC 668	Molecular Biology (May be taken in place of BIOC 646 & BIOC 649)	3-4
BIOC 670	Biomedical Genetics and Genomics	3-5
BIOC 675	Cancer Biology	4
ENGL 677	Graduate Writing in the Disciplines	3
<b>Students complete one of the following options:</b>		
<b>MS Thesis</b>		
Ten (10) credit hours from the following:		
BIOC 613	Biochemistry Laboratory	2-4
BIOC 619	Research	6-8
<b>MS Non-Thesis: Laboratory-Based</b>		
BIOC 613	Biochemistry Laboratory	2-4
<b>MS Non-Thesis: Course-Based</b>		
Additional Course Electives (inside or outside BIOC) <sup>1</sup>		
<b>Minimum Total Hours</b>		<b>30</b>

<sup>1</sup> Laboratory work (BIOC 613) may be considered an elective to count towards a non-thesis, course-based degree option.

## Thesis/Final Paper

### 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 Graduate School Standards for Preparation of Theses and Dissertations (<https://louisville.edu/graduate/current-students/thesis-dissertation-information/>).

### Paper

A paper based on literature research or laboratory research (rotation research) is required for the non-thesis, lab option. The topic will be approved by the Director of Graduate Studies and the paper evaluated by two faculty.

A paper based on literature research is required for the non-thesis, coursework option. The topic will be approved by the Director of Graduate Studies and the paper evaluated by two faculty.

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## Schedule of Course Offerings

Year 1		
Fall		Hours
BIOC 613	Biochemistry Laboratory (Required for lab-based option)	2-4
BIOC 619	Research (Required for thesis-based option)	1-9
BIOC 645	Advanced Biochemistry I (Required)	4
<b>Hours</b>		<b>4</b>
Spring		
BIOC 613	Biochemistry Laboratory (Required for lab-based option)	2-4
BIOC 619	Research (Required for thesis-based option)	1-9
BIOC 630	Responsible Conduct of Research: Survival Skills and Research Ethics (Required)	1
BIOC 647	Advanced Biochemistry II (Required)	4
BIOC 667	Cell Biology (Elective)	3
BIOC 675	Cancer Biology (Elective)	4
<b>Hours</b>		<b>12</b>
Year 2		
Fall		
BIOC 613	Biochemistry Laboratory	2-4
BIOC 619	Research	1-15
BIOC 646	Nucleic acids and information metabolism	1
BIOC 649	Protein Function: from interactions to enzyme control	1
BIOC 648	Journal Club in Biochemistry and Molecular Genetics	1
BIOC 663	High-Throughput Sequencing Data Analysis	3
BIOC 670	Biomedical Genetics and Genomics	3-5
<b>Hours</b>		<b>12-30</b>
Spring		
BIOC 606	Biochemistry Seminar	1
BIOC 613	Biochemistry Laboratory	2-4
BIOC 619	Research	1-15
BIOC 648	Journal Club in Biochemistry and Molecular Genetics	1
BIOC 668	Molecular Biology	3-4
<b>Hours</b>		<b>8-25</b>
<b>Minimum Total Hours</b>		<b>36-71</b>