MOLECULAR & CELLULAR BIOLOGY, MS

for the degree of Master of Science: Major in Molecular & Cellular Biology

The Master of Science in Molecular and Cellular Biology (MS in MCB) at the University of Illinois provides a non-thesis, course-based degree program for those students interested in additional advanced preparation for professional or graduate school or for future careers in industry, government or academia. The goal of the program is to provide students with a strong and broad educational background and problem-solving skill set in molecular and cellular biology at the advanced level without requiring a research thesis component. While the MS in MCB program is suitable as preparation for a PhD program in MCB or related areas, it is uncommon for students to enter the MCB PhD program at the University of Illinois after finishing this degree.

The MS in MCB degree program serves primary two different audiences:

- Those students who wish to obtain a master’s degree during a post-baccalaureate gap year, but prior to admission to professional or graduate school, by deepening and broadening their scientific knowledge base to better prepare for the next degree program.
- Those students who plan to obtain employment in industry, government, or nongovernmental organizations, where additional coursework at the advanced level would enhance their competitiveness, and in particular, where their laboratory skills could be bolstered through advanced laboratory courses without the necessity of conducting a research-based thesis project.

Students will take foundation and advanced courses from an approved list in the School of Molecular and Cellular Biology, choosing from a wide range of course topics, including biochemistry, molecular genetics, cell biology, microbiology, neurobiology, systems and computational biology, and advanced laboratory methods. Students will take advanced lecture, discussion, and seminar courses that hone scientific critical reading, analytical thinking, and communication skills that are highly desirable for advanced degree programs and future employers.

The MS in MCB degree requires a minimum of two full-time semesters, which can be completed within one year, depending on prior education and experience. Some students may choose to take up to two years to complete, if they hold outside employment, but it is intended to be completed within two years. To maintain active status in the program, students must register for a minimum of 12 credit hours in 400- or 500-level MCB courses per semester.

Students entering the MS in MCB program will be expected to have completed a Bachelor’s degree from an accredited 4-year college or university with undergraduate coursework in biology, chemistry, physics, calculus and English composition. Applicants must have completed the last 60 hours of coursework with grades of B (3.0 on a scale of 1 to 4) or better. Deficiencies in these areas will require additional coursework, as necessary, for successful completion of the degree.

for the degree of Master of Science Major in Molecular & Cellular Biology

Minimum required major and supporting course work: To maintain active status in the program students must register for a minimum of 12 credit hours in 400- or 500-level MCB courses per semester. A course-based master’s degree requires a minimum of two full-time semesters.

Core Curriculum

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td></td>
<td>One 3- or 4-hour 400-level course from each of 4 disciplinary areas:</td>
<td>12-14</td>
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</table>

Area 1: Biochemistry

- MCB 406 Gene Expression & Regulation
- MCB 446 Physical Biochemistry
- MCB 450 Introductory Biochemistry
- BIOC 440 Physical Chemistry Principles (sxn B)
- BIOC 455 Technqs Biochem & Biotech

Area 2: Cell & Developmental Biology

- MCB 364 Eukaryotic Cell Biology Laboratory
- MCB 400 Cancer Cell Biology
- MCB 410 Developmental Biology, Stem Cells and Regenerative Medicine
- MCB 458 Basic Human Pathology
- MCB 471 Cell Structure and Dynamics

Area 3: Microbiology

- MCB 421 Microbial Genetics
- MCB 424 Microbial Biochemistry
- MCB 426 Bacterial Pathogenesis
- MCB 428 Microbial Pathogens Laboratory
- MCB 429 Cellular Microbiology & Disease
- MCB 431 Microbial Physiology
- MCB 432 Computing in Molecular Biology
- MCB 435 Evolution of Infectious Disease
- MCB 436 Global Biosecurity
- MCB 493 Special Topics Mol Cell Biol (Topics Change Regularly)

Area 4: Molecular & Integrative Physiology

- MCB 401 Cell & Membrane Physiology
- MCB 402 Sys & Integrative Physiology
- MCB 413 Endocrinology
- MCB 419 Brain, Behavior & Info Process
- MCB 461 Cell & Molecular Neuroscience
- MCB 462 Integrative Neuroscience
- MCB 465 Human Metabolic Disease
- MCB 493 Special Topics Mol Cell Biol (sxn UNK: unnamed Physiology Lab)

Elective Hours

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<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tr>
<td></td>
<td>Electives Hours Required: 6-8</td>
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<tr>
<td>MCB 501</td>
<td>Advanced Biochemistry</td>
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<tr>
<td>MCB 502</td>
<td>Advanced Molecular Genetics</td>
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<tr>
<td>MCB 521</td>
<td>Advanced Microbial Genetics</td>
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<tr>
<td>MCB 529</td>
<td>Special Topics Cell Devel Biol (Topics Change Regularly)</td>
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<tr>
<td>MCB 526</td>
<td>Adv Bacterial Pathogenesis</td>
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<tr>
<td>MCB 532</td>
<td>Advanced Microbial Physiology</td>
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<tr>
<td>MCB 534</td>
<td>Advanced Microbial Metabolism</td>
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<tr>
<td>MCB 539</td>
<td>Advanced Cellular Microbiology</td>
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<tr>
<td>MCB 553</td>
<td>Enzyme Reaction Mechanisms</td>
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Information listed in this catalog is current as of 08/2019
Molecular & Cellular Biology, MS

MCB 555  Anlys Biochemical Literature

Other courses may be available See MS MCB Program Office for review request.

Minimum 500-level Hours Required 12
Total Hours Required 32

Other Requirements

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<tr>
<th>Requirement</th>
<th>Description</th>
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<tbody>
<tr>
<td>Minimum 500-level Hours Required:</td>
<td>12</td>
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<tr>
<td>Minimum Hours Required Within the 8 Unit:</td>
<td>8</td>
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<tr>
<td>Courses taken &quot;credit/no credit&quot; may not be used toward degree requirements.</td>
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<tr>
<td>Courses, or their equivalents, taken as an undergraduate/prior to admission to this program, may not be counted toward the requirements for this program.</td>
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<tr>
<td>MCB 450 is only available to students who have not already taken MCB 354 or the equivalent.</td>
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<td>Minimum GPA:</td>
<td>3.0</td>
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1 For additional details and requirements refer to the MS MCB Program Handbook and the Graduate College Handbook (http://www.grad.illinois.edu/gradhandbook).

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