MOLECULAR & CELLULAR BIOLOGY, BSLAS

for the degree of Bachelor of Science in Liberal Arts and Sciences Major in Molecular & Cellular Biology

The Molecular and Cellular Biology major provides students with a solid preparation in molecular biology, molecular genetics, microbiology, cellular biology, biochemistry, physiology, and structural biology. Students will also acquire a strong background in chemistry, math and physical sciences. After completion of the core curriculum in MCB, students may complete the required advanced course work by taking a variety of MCB courses or by selecting a more focused group of courses in any of the following areas: biochemistry, cells and tissues, developmental biology, infection and immunity, microbiology, genetics, neurobiology and physiology. The MCB Advising Program (MAP) staff is available to help students plan their combination of advanced courses.

For students interested in adding licensure to the BSLAS in Molecular & Cellular Biology, please visit the Biology Teaching page: http://mcb.illinois.edu/undergrad/advising/teaching/

Undergraduate degree programs in Molecular & Cellular Biology

Biochemistry, BS (http://catalog.illinois.edu/undergraduate/las/biochemistry-bs/)

Molecular & Cellular Biology, BSLAS (p. 1)

Molecular & Cellular Biology Honors Concentration, BSLAS (http://catalog.illinois.edu/undergraduate/las/molecular-cellular-biology-bslas/honors/)

Neuroscience, BSLAS (http://catalog.illinois.edu/undergraduate/las/neuroscience-bslas/)

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Certain advanced courses may be taken prior to completion of the MCB 250-MCB 253, MCB 354 sequence with permission of an academic advisor. A minimum of 15 hours of 300- or 400-level courses in MCB from the approved list is required.

In addition, undergraduate research (MCB 290, or departmental equivalent) is strongly recommended for students planning to go to graduate school. No more than 10 hours of MCB 290, or departmental equivalent credit may be counted towards the 120 hours required for a degree in MCB.

Students earning a degree in Molecular and Cellular Biology may not also earn a second degree in the Specialized Curriculum in Biochemistry.

Students earning a degree in Molecular and Cellular Biology may not double major in Integrative Biology.

Distinction

Students in MCB can qualify for Distinction via one of the following:

Distinction for Excellence in Research:

To be eligible for graduation with Distinction a student must:
Complete 3 semesters of MCB 290 for 2 credit hours or more each semester. Maintain a minimum cumulative GPA of 3.25 at the end of penultimate semester. Give at least one poster presentation at the Undergraduate Research symposium or other approved venue. Obtain a letter of support from their Principal Investigator.

To be eligible for graduation with High Distinction a student must:
Complete 2 semesters of MCB 290 for 2 credit hours or more each semester. Complete 1 semester of MCB 492 for 3 credit hours or more. Maintain a minimum cumulative GPA of 3.25 at the end of penultimate semester. Give at least one poster presentation at the Undergraduate Research symposium or other approved venue. Obtain a letter of support from their Principal Investigator. Submit a written thesis that is approved by the Distinction Committee.

To be eligible for graduation with Highest Distinction a student must:
Complete 2 semesters of MCB 290 for 2 credit hours or more each semester. Complete 1 semester MCB 492 for 3 credit hours or more. Maintain a minimum cumulative GPA of 3.90 at the end of penultimate semester. Give at least one poster presentation at the Undergraduate Research symposium or other approved venue. Obtain a letter of support from their Principal Investigator. Submit a written thesis that is approved by the Distinction Committee. Distinction for Excellence in Academics:

To be eligible for graduation with Academic Distinction a student must:
Maintain a major GPA of 3.90 or higher in the MCB major (biology, chemistry, physics and math courses for the MCB major) at the end of their penultimate semester.

General education: Students must complete the Campus General Education (https://courses.illinois.edu/gened/DEFAULT/DEFAULT/) requirements including the campus general education language requirement.

Minimum required major and supporting course work: 67-71 hours, including 21 hours of 300- or 400-level courses; 12 hours of 300- and 400-level courses in the major must be taken on this campus. Minimum hours required for graduation: 120 hours.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 220</td>
<td>Calculus</td>
<td>4-5</td>
</tr>
<tr>
<td>or MATH 221</td>
<td>Calculus I</td>
<td></td>
</tr>
<tr>
<td>MATH 231</td>
<td>Calculus II</td>
<td>3</td>
</tr>
<tr>
<td>or STAT 212</td>
<td>Biostatistics</td>
<td></td>
</tr>
<tr>
<td>Select one group of courses:</td>
<td>8-10</td>
<td></td>
</tr>
<tr>
<td>CHEM 102</td>
<td>General Chemistry I</td>
<td></td>
</tr>
<tr>
<td>&amp; CHEM 103</td>
<td>and General Chemistry Lab I</td>
<td></td>
</tr>
<tr>
<td>&amp; CHEM 104</td>
<td>and General Chemistry II</td>
<td></td>
</tr>
<tr>
<td>&amp; CHEM 105</td>
<td>and General Chemistry Lab II</td>
<td></td>
</tr>
<tr>
<td>CHEM 202</td>
<td>Accelerated Chemistry I</td>
<td></td>
</tr>
<tr>
<td>&amp; CHEM 203</td>
<td>and Accelerated Chemistry Lab I</td>
<td></td>
</tr>
<tr>
<td>&amp; CHEM 204</td>
<td>and Accelerated Chemistry II</td>
<td></td>
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<tr>
<td>&amp; CHEM 205</td>
<td>and Accelerated Chemistry Lab II</td>
<td></td>
</tr>
<tr>
<td>CHEM 232</td>
<td>Elementary Organic Chemistry I</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 233</td>
<td>Elementary Organic Chem Lab I</td>
<td>2</td>
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<tr>
<td>Select one group of courses:</td>
<td>10-12</td>
<td></td>
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<tr>
<td>PHYS 101</td>
<td>College Physics: Mech &amp; Heat</td>
<td></td>
</tr>
<tr>
<td>&amp; PHYS 102</td>
<td>and College Physics: E&amp;M &amp; Modern</td>
<td></td>
</tr>
</tbody>
</table>
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Sample Sequence
This sample sequence is intended to be used only as a guide for degree completion. All students should work individually with their academic advisors to decide the actual course selection and sequence that works best for them based on their academic preparation and goals. Enrichment programs such as study abroad, minors, internships, and so on may impact the structure of this four-year plan. Course availability is not guaranteed during the semester indicated in the sample sequence.

Students must fulfill their Language Other Than English requirement by successfully completing a fourth level of a language other than English. See the corresponding section on the Requirements page (http://catalog.illinois.edu/general-information/ degree-general-education-requirements/).

First Year
First Semester  Hours  Second Semester Hours
Free elective course  1  General Education course  3
MATH 220 or 221  5 MATH 231 or STAT 212  3
CHEM 102 or 202  3 CHEM 104 or 204  3
CHEM 103 or 203  1 CHEM 105 or 205  1
Composition I or General Education course  4 General Education course or Composition I  3

Second Semester Hours  14  13

Second Year
First Semester  Hours  Second Semester Hours
PHYS 101 or 211  4 PHYS 102 or 212  4
CHEM 232  4 IB 150  4
CHEM 233  2 MCB 150  4
Language Other Than English (3rd level)  4 Language Other Than English (4th level)  4
General Education course  3  3

Fourth Year
First Semester  Hours  Second Semester Hours
300-400 level coursework  4 MCB 354  3
300-400 level coursework  4 300-400 level coursework  4
General Education course  3 300-400 level lab  4
Free elective course  3 General Education course  3
Free elective course  3  3

Total Hours 120

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Upon successful completion of the Molecular & Cellular Biology undergraduate curriculum, students will be able to:

1. understand and appreciate the diversity of life as it evolved over time by processes of mutation, selection and genetic change.
2. illustrate that fundamental structural units define the function of all living things.
3. explain that the growth, development, and behavior of organisms are activated through the expression of genetic information in context.
4. summarize that biological systems grow and change by processes based upon chemical transformation pathways and are governed by the laws of physics.
5. illustrate that living systems are interconnected and interacting across scales of space and time.
6. design a scientific process and employ the scientific method, demonstrating that biology is evidence based and grounded in the formal practices of observation, experimentation, and hypothesis testing.
7. execute quantitative analysis to interpret biological data.
8. construct and utilize predictive models to study and describe complex biological systems.
9. apply concepts from other sciences in order to interpret biological phenomena.
10. communicate biological concepts and understanding to members of a diverse scientific community as well as to the general public.
11. identify social and historical dimensions of biological investigation.
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School of Molecular & Cellular Biology website (https://mcb.illinois.edu/undergrad/)
School Faculty (https://mcb.illinois.edu/people/)

MCB advising (https://mcb.illinois.edu/undergrad/advising/)
MCB advising email (advising@mcb.illinois.edu)

Overview of College Admissions & Requirements: Liberal Arts & Sciences (http://catalog.illinois.edu/schools/las/academic-units/)
College of Liberal Arts and Sciences website (https://las.illinois.edu/)

Information listed in this catalog is current as of 05/2024