## Biochemistry and Molecular Biology: Biotechnology, BSAG

### Requirements for Students Matriculating in or before Academic Year 2024-2025

Learn more about University Academic Regulation 3.1 ([http://catalog.okstate.edu/university-academic-regulations/#matriculation](http://catalog.okstate.edu/university-academic-regulations/#matriculation)).

**Minimum Overall Grade Point Average**: 2.00

**Total Hours**: 120

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 1113</td>
<td>Composition I</td>
<td>3</td>
</tr>
<tr>
<td>or ENGL 1313</td>
<td>Critical Analysis and Writing I</td>
<td></td>
</tr>
<tr>
<td>ENGL 1213</td>
<td>Composition II</td>
<td>3</td>
</tr>
<tr>
<td>or ENGL 1413</td>
<td>Critical Analysis and Writing II</td>
<td></td>
</tr>
<tr>
<td>HIST 1103</td>
<td>Survey of American History</td>
<td>3</td>
</tr>
<tr>
<td>HIST 1483</td>
<td>American History to 1865 (H)</td>
<td></td>
</tr>
<tr>
<td>HIST 1493</td>
<td>American History Since 1865 (DH)</td>
<td></td>
</tr>
<tr>
<td>POLS 1113</td>
<td>American Government</td>
<td>3</td>
</tr>
<tr>
<td>MATH 1813</td>
<td>Preparation for Calculus (A)</td>
<td>3</td>
</tr>
</tbody>
</table>

### English Composition

See Academic Regulation 3.5 ([http://catalog.okstate.edu/university-academic-regulations/#english-composition/](http://catalog.okstate.edu/university-academic-regulations/#english-composition/))

### American History & Government

Select one of the following:

- HIST 1103 | Survey of American History                | 3     |
- HIST 1483 | American History to 1865 (H)              |       |
- HIST 1493 | American History Since 1865 (DH)         |       |

### Analytical & Quantitative Thought (A)

- MATH 1813 | Preparation for Calculus (A)              | 3     |

### Humanities (H)

Courses designated (H) | 6

### Natural Sciences (N)

- CHEM 1314 | Chemistry I (LN)                          | 4     |

Select five hours of courses designated (N) | 5

### Social & Behavioral Sciences (S)

- AGEC 1113 | Introduction to Agricultural Economics (S) | 3     |

### General Education Requirements - Additional General Education

Courses designated (A), (H), (N), or (S) | 7

### Hours Subtotal

| Hours Subtotal | 40 |

### Diversity (D) & International Dimension (I)

May be completed in any part of the degree plan

Select at least one Diversity (D) course

Select at least one International Dimension (I) course

### College/Departmental Requirements

- UNIV 1111 | First Year Seminar (or other approved first year seminar course) | 1     |

From two of the following groups, select one course:

**Group 1**

- PLNT 1213 | Introduction to Plant and Soil Systems (N) |       |
- HORT 1013 | Principles of Horticultural Science (LN)   |       |
- NREM 1113 | Elements of Forestry                       |       |

**Group 2**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOIL 1113</td>
<td>Land, Life and the Environment (N)</td>
<td></td>
</tr>
<tr>
<td>SOIL 2124</td>
<td>Fundamentals of Soil Science (N)</td>
<td></td>
</tr>
<tr>
<td>ANSI 1023</td>
<td>Introduction to the Animal Sciences</td>
<td></td>
</tr>
<tr>
<td>&amp; ANSI 1021</td>
<td>and Introduction to the Animal Sciences Lab</td>
<td></td>
</tr>
<tr>
<td>or ANSI 1124</td>
<td>Introduction to the Animal Sciences</td>
<td></td>
</tr>
<tr>
<td>FDSC 1133</td>
<td>Fundamentals of Food Science</td>
<td></td>
</tr>
<tr>
<td>ENTO 2993</td>
<td>Introduction to Entomology (LN)</td>
<td></td>
</tr>
<tr>
<td>ENTO 3003</td>
<td>Livestock Entomology</td>
<td></td>
</tr>
</tbody>
</table>

**Group 4**

- NREM 1014 | Introduction to Natural History (LN)      |       |
- NREM 3013 | Applied Ecology and Conservation          |       |
- ENVR 1113 | Elements of Environmental Science (N)     |       |
- BIOC 2344 | Chemistry and Applications of Biomolecules |     |
- BIOC 3713 | Biochemistry I                            |       |
- LA 1013 | Introduction to Landscape Architecture    |       |

### Written and Oral Communication

Select one of the following:

- AGCM 3103 | Written Communications in Agricultural Sciences and Natural Resources | 3     |
- BCOM 3113 | Written Communication                     |       |
- ENGL 3323 | Technical Writing                         | 2     |

Select one of the following:

- AGCM 3203 | Oral Communications in Agricultural Sciences & Natural Resources (S) | 3     |
- SPCH 2713 | Introduction to Speech Communication (S) | 3     |
- SPCH 3733 | Elements of Persuasion (S)                | 3     |

### Hours Subtotal

| Hours Subtotal | 13 |

### Major Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOC 1990</td>
<td>freshman research in biochemistry and molecular biology</td>
<td>1</td>
</tr>
<tr>
<td>BIOC 2352</td>
<td>fundamental biochemistry</td>
<td>2</td>
</tr>
<tr>
<td>BIOC 3723</td>
<td>biochemistry and molecular biology laboratory</td>
<td>3</td>
</tr>
<tr>
<td>BIOC 3813</td>
<td>biochemistry II</td>
<td>3</td>
</tr>
<tr>
<td>BIOC 4990</td>
<td>undergraduate research</td>
<td>2</td>
</tr>
<tr>
<td>BIOC 4113</td>
<td>molecular biology</td>
<td>3</td>
</tr>
<tr>
<td>BIOC 3153</td>
<td>synthetic biology</td>
<td>3</td>
</tr>
<tr>
<td>BIOC 4013</td>
<td>biotechnology development and implementation</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 1515</td>
<td>chemistry II (LN)</td>
<td>5</td>
</tr>
<tr>
<td>CHEM 2113</td>
<td>principles of analytical chemistry</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 3053</td>
<td>organic chemistry I</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 3112</td>
<td>organic chemistry laboratory</td>
<td>2</td>
</tr>
<tr>
<td>CHEM 3153</td>
<td>organic chemistry II</td>
<td>3</td>
</tr>
</tbody>
</table>

Select one of the following:

- MATH 2123 | Calculus for Technology Programs I (A)    |       |
- STAT 2013 | Elementary Statistics (A)                 |       |
- STAT 4013 | Statistical Methods I (A)                 |       |
- MICR 2123 | introduction to microbiology               | 3     |
- MICR 2132 | introduction to microbiology laboratory   | 2     |
PHYS 1114 College Physics I (LN) 4
or PHYS 2014 University Physics I (LN)

BIOL 1113 Introductory Biology (N) 4
& BIOL 1111 and Introductory Biology Laboratory (LN)
or BIOL 1114 Introductory Biology (LN)

BIOL 1604 Animal Biology 4
or PBIO 1404 Plant Biology (LN)

Select one of the following: 3
- ANSI 3423 Animal Genetics
- BIOL 3023 General Genetics
- PLNT 3554 Plant Genetics and Biotechnology

Related Courses
Select a minimum of 8 hours of BIOC or courses related to BIOC, subject to Advisor approval, of the following: 8
- BIOC 2202 Medicine and Molecules
- BIOC 3003 Hypothesis-Driven Undergraduate Research
- BIOC 4023 Molecular Biology and Stress Response of Plants
- BIOC 4213 Disease and Metabolism
- BIOC 3523 Biochemistry of Disease at the Cellular Level
- BIOC 4723 Introduction to Bioinformatics
- BIOC 3223 Physical Chemistry for Biologists
  or CHEM 3433 Physical Chemistry I
- BIOC 4883 Senior Seminar in Biochemistry
- BIOC 4990 Undergraduate Research
- MICR 3033 Cell and Molecular Biology
- PHYS 1214 College Physics II (LN)
or PHYS 2114 University Physics II (LN)
- PLNT 4933 Gene Editing and Genetically Modified Crops

Hours Subtotal 67

Electives
Select 0 hours to complete required total for degree 0

Hours Subtotal 0

Total Hours 120

Other Requirements
- A minimum of 40 semester credit hours and 100 grade points must be earned in courses numbered 3000 or above.
- A 2.00 GPA or higher in upper-division hours.

Additional State/OSU Requirements
- At least: 60 hours at a four-year institution; 30 hours completed at OSU; 15 of the final 30 or 50% of the upper-division hours in the major field completed at OSU.
- Limit of: one-half of major course requirements as transfer work; one-fourth of hours earned by correspondence; 8 transfer correspondence hours.
- Students will be held responsible for degree requirements in effect at the time of matriculation and any changes that are made, so long as these changes do not result in semester credit hours being added or do not delay graduation.
- Degrees that follow this plan must be completed by the end of Summer 2030.