**BIOCHEMISTRY AND MOLECULAR BIOLOGY: PRE-MEDICAL OR PRE-VETERINARY SCIENCE, BSAG**

Requirements for Students Matriculating in or before Academic Year 2021-2022. 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>
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<tbody>
<tr>
<td>ENGL 1113</td>
<td>Composition I or ENGL 1313 Critical Analysis and Writing I</td>
<td>3</td>
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<tr>
<td>ENGL 1213</td>
<td>Composition II</td>
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<tr>
<td>ENGL 1413</td>
<td>Critical Analysis and Writing II</td>
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<tr>
<td>ENGL 3323</td>
<td>Technical Writing</td>
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<tr>
<td>HIST 1103</td>
<td>Survey of American History</td>
<td>3</td>
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<tr>
<td>HIST 1483</td>
<td>American History to 1865 (H)</td>
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<tr>
<td>HIST 1493</td>
<td>American History Since 1865 (DH)</td>
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<td>POLS 1113</td>
<td>American Government</td>
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<tr>
<td>MATH 2144</td>
<td>Calculus I (A)</td>
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<tr>
<td>AGCM 3103</td>
<td>Written Communications in Agricultural Sciences and Natural Resources</td>
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<td>BCOM 3113</td>
<td>Written Communication</td>
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<td>BCOM 3443</td>
<td>Business Communication for International Students</td>
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<td>ENGL 3323</td>
<td>Technical Writing 2</td>
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<tr>
<td>AGCM 3203</td>
<td>Oral Communications in Agricultural Sciences &amp; Natural Resources (S)</td>
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<td>SPCH 2713</td>
<td>Introduction to Speech Communication (S)</td>
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<td>SPCH 3733</td>
<td>Elements of Persuasion (S)</td>
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**Hours Subtotal**: 13

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<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>BIOC 3723</td>
<td>Biochemistry and Molecular Biology Laboratory</td>
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<tr>
<td>BIOC 3813</td>
<td>Biochemistry II</td>
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<td>BIOL 1114</td>
<td>Introductory Biology (LN)</td>
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<td>BIOL 1604</td>
<td>Animal Biology</td>
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<td>CHEM 1515</td>
<td>Chemistry II (LN)</td>
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<td>CHEM 3053</td>
<td>Organic Chemistry I</td>
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<td>CHEM 3112</td>
<td>Organic Chemistry Laboratory</td>
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<td>CHEM 3153</td>
<td>Organic Chemistry II</td>
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<td>MATH 2153</td>
<td>Calculus II (A)</td>
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<tr>
<td>STAT 2013</td>
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<tr>
<td>STAT 4013</td>
<td>Statistical Methods I (A)</td>
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<tr>
<td>MICR 2123</td>
<td>Introduction to Microbiology</td>
<td>3</td>
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**Write a text summarizing the requirements for the Biochemistry and Molecular Biology major.**

The Biochemistry and Molecular Biology major requires a minimum overall grade point average of 2.00 and an aggregate of 120 total hours. General Education Requirements include English Composition, American History & Government, and Analytical & Quantitative Thought, totaling 40 hours. Writing and Oral Communications courses are also required. The major requirements consist of Core Courses, which cover fundamental aspects of biochemistry and molecular biology, ensuring a strong foundation in the field. These courses include subjects such as Biochemistry and Molecular Biology Laboratory, Biochemistry II, and Introductory Biology. Additional courses in Organic Chemistry, Plant Biology, and Microbiology provide a well-rounded education. Select courses from different groups ensure a broad understanding of various biological sciences, preparing students for careers in medicine, veterinary science, or related fields.
### Related Courses

**Option:**

Select an option (p. 2)  

**Hours Subtotal** 63

### Electives

Select 4 hours or hours to complete required total for degree. 4

**Hours Subtotal** 4

**Total Hours** 120

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1. College & Departmental requirements that may be used to meet General Education requirements.

2. If ENGL 3323 Technical Writing is substituted for ENGL 1213 Composition II above; hours in this block are reduced by 3.

3. If used as (S) course above, hours in this block reduced by 3.

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### Options

#### Option 1

With the approval of the advisor, department head, and dean, hours of basic sciences from an accredited chiropractic, dental medial, optometry, osteopathic, pharmacy, podiatry, or veterinary medical school to total 57 hours.

#### Option 2

**Code** | **Title** | **Hours**
---|---|---
BIOC 3223 | Physical Chemistry for Biologists | 3

or CHEM 3433 | Physical Chemistry I | 3

BIOC 4883 | Senior Seminar in Biochemistry | 3

Select one of the following: 3

- BIOL 3023 | General Genetics |
- ANSI 3423 | Animal Genetics |
- PLNT 3554 | Plant Genetics and Biotechnology |

Select one of the following: 4

- BIOL 3204 | Physiology |
- ENTO 3044 | Insect Morphology and Physiology |
- PBIO 4463 | Plant Physiology |

Select a minimum of 7 hours of BIOC or courses related to BIOC, subject to Advisor approval, of the following: 7

- ANSI 3433 | Animal Breeding |
- ANSI 3444 | Animal Reproduction |
- ANSI 3543 | Principles of Animal Nutrition |
- BIOC 1990 | Freshman Research in Biochemistry and Molecular Biology (up to 2 hours)  

1. BIOC 2202 | Medicine and Molecules |

2. BIOC 2352 | Fundamental Biochemistry |

3. BIOC 3003 | Hypothesis-Driven Undergraduate Research |

4. BIOC 4113 | Molecular Biology |

5. BIOC 4523 | Biochemistry of the Cell |

6. BIOC 4723 | Introduction to Bioinformatics |

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- BIOC 4990 | Undergraduate Research  

1. BIOC 3223 | Molecular Biology |

2. BIOC 4523 | Bioinformatics |

3. MICR 4012 | Molecular Microbiology Laboratory I |

4. MICR 4013 | Microbial Physiology & Ecology |

5. MICR 4112 | Molecular Microbiology Capstone |

6. MICR 4123 | Virology |

7. MICR 4203 | Bioinformatics |

8. MICR 4053 | Pathogenic Microbiology |

9. MICR 4052 | Pathogenic Microbiology Lab |

10. MICR 4233 | Advanced Cell and Molecular Biology |

11. MICR 4253 | Concepts in Medical Genetics |

12. MICR 4263 | Microbial Genetics: from Genes to Genomes |

13. MICR 4323 | Cellular Energy Metabolism |

14. MICR 4423 | Antibiotics and Antibiotic Resistance |

15. NSCI 4023 | Nutrition in the Pathophysiology of Chronic Disease |

16. NSCI 4123 | Human Nutrition and Metabolism I |

17. NSCI 4143 | Human Nutrition and Metabolism II |

18. PBIO 4233 | Plant Anatomy |

19. PBIO 4462 | Plant Physiology Laboratory |

20. PBIO 4423 | Plant Mineral Nutrition |
PHYS 4313  Molecular Biophysics
PLNT 4353  Plant Breeding
STAT 4013  Statistical Methods I (A) (if not used as (A) above)

Total Hours 20

1 Total hours of BIOC 1990 Freshman Research in Biochemistry and Molecular Biology and BIOC 4990 Undergraduate Research may not exceed 10 hours.

**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 2027.