**Biochemistry and Molecular Biology: Pre-Medical or Pre-Veterinary Science, BSAG**

Requirements for Students Matriculating in or before Academic Year 2019-2020. Learn more about University Academic Regulation 3.1 (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><strong>General Education Requirements</strong></td>
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<tr>
<td>ENGL 1113</td>
<td>Composition I</td>
<td>3</td>
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<tr>
<td>or ENGL 1313</td>
<td>Critical Analysis and Writing I</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>
<td></td>
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<tr>
<td><strong>American History &amp; Government</strong></td>
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<tr>
<td>HIST 1103</td>
<td>Survey of American History</td>
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<tr>
<td>HIST 1483</td>
<td>American History to 1865 (H)</td>
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<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><strong>Analytical &amp; Quantitative Thought (A)</strong></td>
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<tr>
<td>MATH 2144</td>
<td>Calculus I (A)</td>
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<tr>
<td><strong>Humanities (H)</strong></td>
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<tr>
<td>Courses designated (H)</td>
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<tr>
<td><strong>Natural Sciences (N)</strong></td>
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<tr>
<td>Must include one Laboratory Science (L) course</td>
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<tr>
<td>CHEM 1314</td>
<td>Chemistry I (LN)</td>
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<tr>
<td>5 hours courses designated N</td>
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<tr>
<td><strong>Social &amp; Behavioral Sciences (S)</strong></td>
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<tr>
<td>AGEC 1113</td>
<td>Introduction to Agricultural Economics (S)</td>
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<tr>
<td><strong>Additional General Education</strong></td>
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<tr>
<td>Courses designated (A), (H), (N), or (S)</td>
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<tr>
<td><strong>Hours Subtotal</strong></td>
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<tr>
<td><strong>Diversity (D) &amp; International Dimension (I)</strong></td>
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<tr>
<td>May be completed in any part of the degree plan</td>
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<tr>
<td>Select at least one Diversity (D) course</td>
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<tr>
<td>Select at least one International Dimension (I) course</td>
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<tr>
<td><strong>College/Departmental Requirements</strong></td>
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<tr>
<td><strong>Agricultural Sciences and Natural Resources Core</strong></td>
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<tr>
<td>AG 1011</td>
<td>First Year Seminar</td>
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<td>From two of the following groups, select one course:</td>
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| Group 1: | PLNT 1213 | Introduction to Plant and Soil Systems |
|          | HORT 1013 | Principles of Horticultural Science (LN) |
|          | NREM 1113 | Elements of Forestry |

| Group 2: | SOIL 1113 | Land, Life and the Environment (N) |
|          | SOIL 2124 | Fundamentals of Soil Science (N) |

| Group 3: | ANSI 1124 | Introduction to the Animal Sciences |
|          | FDSC 1133 | Fundamentals of Food Science |
|          | ENTO 2993 | Introduction to Entomology (LN) |
|          | ENTO 3003 | Livestock Entomology |

| Group 4: | NREM 1014 | Introduction to Natural History (LN) |
|          | NREM 2013 | Ecology of Natural Resources |
|          | ENVR 1113 | Elements of Environmental Science |
|          | BIOC 2344 | Chemistry and Applications of Biomolecules |
|          | BIOC 3713 | Biochemistry I |
|          | LA 1013   | Introduction to Landscape Architecture and Landscape Management |

**Written and Oral Communications**

Select one of the following: 3
- AGCM 3103 | Written Communications in Agricultural Sciences and Natural Resources |
- BCOM 3113 | Written Communication |
- BCOM 3443 | Business Communication for International Students |
- ENGL 3323 | Technical Writing |

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

**Hours Subtotal** 13

**Major Requirements**

**Core Courses**
- BIOC 3723 | Biochemistry and Molecular Biology Laboratory |
- BIOC 3813 | Biochemistry II |
- BIOL 1114 | Introductory Biology (LN) |
- BIOL 1604 | Animal Biology |
- or PBIO 1404 | Plant Biology (LN) |
- CHEM 1515 | Chemistry II (LN) |
- CHEM 3053 | Organic Chemistry I |
- CHEM 3112 | Organic Chemistry Laboratory |
- CHEM 3153 | Organic Chemistry II |

Select one of the following: 3
- MATH 2153 | Calculus II (A) |
- STAT 2013 | Elementary Statistics (A) |
- STAT 4013 | Statistical Methods I (A) |
- MICR 2123 | Introduction to Microbiology |
MICR 2132  Introduction to Microbiology Laboratory  2
PHYS 1114  College Physics I (LN)  4
or PHYS 2014  University Physics I (LN)  4
PHYS 1214  College Physics II (LN)  4
or PHYS 2114  University Physics II (LN)  4

Related Courses
Option:
Select an option (p. 2)  20

Hours Subtotal  63

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

Hours Subtotal  4

Total Hours  120

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

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:

Biol 3023  General Genetics  3
ANSI 3423  Animal Genetics  3
PLNT 3554  Plant Genetics and Biotechnology  3

Select one of the following:

BIO 3204  Physiology  4
ENTO 3044  Insect Morphology and Physiology  4
PBIO 4463  Plant Physiology  4

Select a minimum of 6 hours of BIOC or courses related to BIOC, subject to Advisor approval, of the following:

ANSI 3433  Animal Breeding  3
ANSI 3443  Animal Reproduction  3
ANSI 3543  Principles of Animal Nutrition  3
BIOC 1990  Freshman Research in Biochemistry and Molecular Biology (up to 2 hours)  3
BIOC 2202  Medicine and Molecules  3
BIOC 2352  Fundamental Biochemistry  3
BIOC 3003  Hypothesis-Driven Undergraduate Research  3
BIOC 4113  Molecular Biology  3
BIOC 4523  Biochemistry of the Cell  3
BIOC 4723  Introduction to Bioinformatics  3

BIOL 3034  General Ecology  4
BIOL 3104  Invertebrate Zoology  4
BIOL 3114  Vertebrate Zoology  4
BIOL 3214  Human Anatomy  4
BIOL 3233  Human Reproduction  4
BIOL 4104  General Parasitology  4
BIOL 4133  Evolution  4
BIOL 4134  Embryology  4
BIOL 4174  Mammalogy  4
BIOL 4215  Mammalian Physiology  4
BIOL 4223  Mammalian Physiology Laboratory  4
BIOL 4283  Endocrinology  4
BIOL 4293  Behavioral Neuroendocrinology  4
BIOL 4363  Principles of Toxicology  4
CHEM 2113  Principles of Analytical Chemistry  4
CHEM 2122  Quantitative Analysis Laboratory  4
CHEM 3353  Descriptive Inorganic Chemistry  4
CHEM 3552  Physical Chemistry Laboratory  4
CHEM 3553  Physical Chemistry II  4
CHEM 4320  Chemical and Spectrometric Identification of Organic Compounds  4
ENTO 4573  Introduction to Forensic Entomology  4
ENTO 4854  Medical and Veterinary Entomology  4
MATH 2163  Calculus III  4
MATH 2233  Differential Equations  4
MATH 3013  Linear Algebra (A)  4
MATH 3263  Linear Algebra and Differential Equations  4
MICR 3143  Medical Mycology  4
MICR 3154  Food Microbiology  4
MICR 3223  Advanced Microbiology  4
MICR 3253  Immunology  4
MICR 4012  Molecular Microbiology Laboratory I  4
MICR 4013  Microbial Physiology & Ecology  4
MICR 4112  Molecular Microbiology Capstone  4
MICR 4123  Virology  4
MICR 4203  Bioinformatics  4
MICR 4053  Pathogenic Microbiology  4
MICR 4052  Pathogenic Microbiology Lab  4
MICR 4233  Advanced Cell and Molecular Biology  4
MICR 4253  Concepts in Medical Genetics  4
MICR 4263  Microbial Genetics: from Genes to Genomes  4
MICR 4323  Biological Energy Transduction  4
MICR 4423  Antibiotics and Antibiotic Resistance  4
NSCI 4023  Nutrition in the Pathophysiology of Chronic Disease  4
NSCI 4123  Human Nutrition and Metabolism I  4
NSCI 4143  Human Nutrition and Metabolism II  4
PBIO 4233  Plant Anatomy  4
PBIO 4462  Plant Physiology Laboratory  4
PBIO 4423  Plant Mineral Nutrition  4
PHYS 4313  Molecular Biophysics  4
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 2025.