BIOCHEMISTRY AND MOLECULAR BIOLOGY, 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></td>
<td><strong>General Education Requirements</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>English Composition</strong></td>
<td></td>
</tr>
<tr>
<td>See Academic Regulation 3.5 (<a href="http://catalog.okstate.edu/university-academic-regulations/#english-composition">http://catalog.okstate.edu/university-academic-regulations/#english-composition</a>)</td>
<td></td>
<td></td>
</tr>
<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>Select one of the following:</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>ENGL 1213</td>
<td>Composition II</td>
<td></td>
</tr>
<tr>
<td>ENGL 1413</td>
<td>Critical Analysis and Writing II</td>
<td></td>
</tr>
<tr>
<td>ENGL 3323</td>
<td>Technical Writing</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>American History &amp; Government</strong></td>
<td></td>
</tr>
<tr>
<td>Select one of the following:</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>HIST 1103</td>
<td>Survey of American History</td>
<td></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></td>
<td><strong>Analytical &amp; Quantitative Thought (A)</strong></td>
<td></td>
</tr>
<tr>
<td>MATH 2144</td>
<td>Calculus I (A) 1</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td><strong>Humanities (H)</strong></td>
<td></td>
</tr>
<tr>
<td>Courses designated (H)</td>
<td></td>
<td>6</td>
</tr>
<tr>
<td></td>
<td><strong>Natural Sciences (N)</strong></td>
<td></td>
</tr>
<tr>
<td>Must include one Laboratory Science (L) course</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CHEM 1314</td>
<td>Chemistry I (LN) 1</td>
<td>4</td>
</tr>
<tr>
<td>Select 5 hours courses designated N</td>
<td></td>
<td>5</td>
</tr>
<tr>
<td></td>
<td><strong>Social &amp; Behavioral Sciences (S)</strong></td>
<td></td>
</tr>
<tr>
<td>AGEC 1113</td>
<td>Introduction to Agricultural Economics (S) 1</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>Additional General Education</strong></td>
<td></td>
</tr>
<tr>
<td>Courses designated (A), (H), (N), or (S)</td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>Hours Subtotal</td>
<td></td>
<td>40</td>
</tr>
<tr>
<td></td>
<td><strong>Diversity (D) &amp; International Dimension (I)</strong></td>
<td></td>
</tr>
<tr>
<td>May be completed in any part of the degree plan</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Select at least one Diversity (D) course</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Select at least one International Dimension (I) course</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>College/Departmental Requirements</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Agricultural Sciences and Natural Resources Core</strong></td>
<td></td>
</tr>
<tr>
<td>AG 1011</td>
<td>First Year Seminar</td>
<td>1</td>
</tr>
<tr>
<td>From two of the following groups, select one course:</td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>Group 1:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PLNT 1213</td>
<td>Introduction to Plant and Soil Systems</td>
<td></td>
</tr>
<tr>
<td>HORT 1013</td>
<td>Principles of Horticultural Science (LN)</td>
<td></td>
</tr>
<tr>
<td>NREM 1113</td>
<td>Elements of Forestry</td>
<td></td>
</tr>
</tbody>
</table>

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 2

Select one of the following: 3
- 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 | 13

Major Requirements
Core Courses
- BIOC 3723 | Biochemistry and Molecular Biology Laboratory 3
- BIOC 3813 | Biochemistry II 3
- BIOC 3223 | Physical Chemistry for Biologists 3
- or CHEM 3433 | Physical Chemistry I 3
- BIOC 4883 | Senior Seminar in Biochemistry 3
- BIOC 4990 | Undergraduate Research (2 hrs) 4
- CHEM 1515 | Chemistry II (LN) 5
- CHEM 2113 | Principles of Analytical Chemistry 3
- CHEM 3053 | Organic Chemistry I 3
- CHEM 3112 | Organic Chemistry Laboratory 2
- CHEM 3153 | Organic Chemistry II 3

Select one of the following: 3
- MATH 2153 | Calculus II (A) 3
- STAT 2013 | Elementary Statistics (A) 3
- STAT 4013 | Statistical Methods I (A) 3
- 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)  
PHYS 1214  College Physics II (LN)  4  
or PHYS 2114  University Physics II (LN)  
BIOL 1114  Introductory Biology (LN)  4  
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  
Select one of the following:  4  
BIOL 3204  Physiology  
ENTO 3044  Insect Morphology and Physiology  
PBIO 4463  Plant Physiology  
Related Courses  
Select a minimum of 6 hours of BIOC or courses related to BIOC, subject to Advisor approval, of the following:  6  
ANSI 3433  Animal Breeding  
ANSI 3443  Animal Reproduction  
ANSI 3543  Principles of Animal Nutrition  
BIOC 1990  Freshman Research in Biochemistry and Molecular Biology (up to 2 hours)  4  
BIOC 2202  Medicine and Molecules  
BIOC 2352  Fundamental Biochemistry  
BIOC 3003  Hypothesis-Driven Undergraduate Research  
BIOC 4113  Molecular Biology  
BIOC 4523  Biochemistry of the Cell  
BIOC 4723  Introduction to Bioinformatics  
BIOC 4990  Undergraduate Research  4  
BIOL 3034  General Ecology  
BIOL 3104  Invertebrate Zoology  
BIOL 3114  Vertebrate Zoology  
BIOL 3214  Human Anatomy  
BIOL 3233  Human Reproduction  
BIOL 4104  General Parasitology  
BIOL 4133  Evolution  
BIOL 4134  Embryology  
BIOL 4174  Mammalogy  
BIOL 4215  Mammalian Physiology  
BIOL 4223  Mammalian Physiology Laboratory  
BIOL 4283  Endocrinology  
BIOL 4293  Behavioral Neuroendocrinology  
BIOL 4363  Principles of Toxicology  
CHEM 2122  Quantitative Analysis Laboratory  
CHEM 3353  Descriptive Inorganic Chemistry  
CHEM 3532  Physical Chemistry Laboratory  
CHEM 3553  Physical Chemistry II  
CHEM 4320  Chemical and Spectrometric Identification of Organic Compounds  
ENTO 4573  Introduction to Forensic Entomology  
ENTO 4733  Insect Behavior and Chemical Ecology  
ENTO 4854  Medical and Veterinary Entomology  
MATH 2163  Calculus III  
MATH 2233  Differential Equations  
MATH 3013  Linear Algebra (A)  
MATH 3263  Linear Algebra and Differential Equations  
MICR 3143  Medical Mycology  
MICR 3154  Food Microbiology  
MICR 3223  Advanced Microbiology  
MICR 3253  Immunology  
MICR 4012  Molecular Microbiology Laboratory I  
MICR 4013  Microbial Physiology & Ecology  
MICR 4112  Molecular Microbiology Capstone  
MICR 4123  Virology  
MICR 4203  Bioinformatics  
MICR 4052  Pathogenic Microbiology  
MICR 4053  Pathogenic Microbiology Lab  
MICR 4233  Advanced Cell and Molecular Biology  
MICR 4253  Concepts in Medical Genetics  
MICR 4263  Microbial Genetics: from Genes to Genomes  
MICR 4323  Biological Energy Transduction  
MICR 4423  Antibiotics and Antibiotic Resistance  
NSCI 4023  Nutrition in the Pathophysiology of Chronic Disease  
NSCI 4123  Human Nutrition and Metabolism I  
NSCI 4143  Human Nutrition and Metabolism II  
PBIO 4233  Plant Anatomy  
PBIO 4423  Plant Mineral Nutrition  
PBIO 4462  Plant Physiology Laboratory  
PHYS 4313  Molecular Biophysics  
PLNT 4353  Plant Breeding  
STAT 4013  Statistical Methods I (A) (if not used as (A) above))  

<table>
<thead>
<tr>
<th>Hours Subtotal</th>
<th>67</th>
</tr>
</thead>
</table>

**Electives**  
Select 0 hours or hours to complete required total for degree  0  
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.  
4. 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.