

# BIOCHEMISTRY AND MOLECULAR BIOLOGY, BSAG

**Requirements for Students Matriculating in or before Academic Year 2020-2021.** 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**

Code	Title	Hours
<b>General Education Requirements</b>		
<i>English Composition</i>		
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> )		
ENGL 1113	Composition I	3
or ENGL 1313	Critical Analysis and Writing I	
Select one of the following:		3
ENGL 1213	Composition II	
ENGL 1413	Critical Analysis and Writing II	
ENGL 3323	Technical Writing	
<i>American History &amp; Government</i>		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865 (H)	
HIST 1493	American History Since 1865 (DH)	
POLS 1113	American Government	3
<i>Analytical &amp; Quantitative Thought (A)</i>		
MATH 2144	Calculus I (A) <sup>1</sup>	4
<i>Humanities (H)</i>		
Courses designated (H)		6
<i>Natural Sciences (N)</i>		
Must include one Laboratory Science (L) course		
CHEM 1314	Chemistry I (LN) <sup>1</sup>	4
Select 5 hours courses designated N		5
<i>Social &amp; Behavioral Sciences (S)</i>		
AGEC 1113	Introduction to Agricultural Economics (S) <sup>1</sup>	3
<i>Additional General Education</i>		
Courses designated (A), (H), (N), or (S)		6
<b>Hours Subtotal</b>		<b>40</b>
<b>Diversity (D) &amp; International Dimension (I)</b>		
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		
<b>College/Departmental Requirements</b>		
<i>Agricultural Sciences and Natural Resources Core</i>		
AG 1011	First Year Seminar	1
From two of the following groups, select one course:		6
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	
<i>Written and Oral Communications</i>		
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 <sup>2</sup>	
Select one of the following:		3
AGCM 3203	Oral Communications in Agricultural Sciences & Natural Resources (S) <sup>3</sup>	
SPCH 2713	Introduction to Speech Communication (S) <sup>3</sup>	
SPCH 3733	Elements of Persuasion (S) <sup>3</sup>	
<b>Hours Subtotal</b>		<b>13</b>
<b>Major Requirements</b>		
<i>Core Courses</i>		
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	
BIOC 4883	Senior Seminar in Biochemistry	3
BIOC 4990	Undergraduate Research (2 hrs) <sup>4</sup>	2
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)	
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)	
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	
<i>Related Courses</i>		
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) <sup>4</sup>	
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 <sup>4</sup>	
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 Capstone 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 4053	Pathogenic Microbiology
MICR 4052	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	Cellular Energy Metabolism
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)

<b>Hours Subtotal</b>	<b>67</b>
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### Electives

Select 0 hours or hours to complete required total for degree	0
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<b>Total Hours</b>	<b>120</b>
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<sup>1</sup> College & Departmental requirements that may be used to meet GE requirements.

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

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

<sup>4</sup> 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 2026.