

BIOLOGY, BACHELOR OF SCIENCE (525)

Program Coordinator

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The major in Biology (525) provides students the opportunity to undertake an in-depth study of biological sciences and its applications. A minor, second major, or certificate is not required. The major in Biology begins with foundation classes and laboratories that build into a core of advanced courses and laboratories. In addition to a required core, students complete a range of biology elective courses tailored to their interests to support their career goals. The students can also apply up to six credit hours of faculty-guided independent research and/or an internship experience toward their degree program.

The program offers six different concentrations - Applied Genetics (BIAG), Applied Microbiology (BIMI), Animal Physiology & Behavior (BIAP), Ecology, Wildlife, & Conservation (BIWC), Integrative Biology (BIIB), and Pre-Medical Professions (BIPM). These six concentrations are designed to facilitate essential requirements and provide training for a variety of career pathways and advanced degree programs to suit student interests.

Concentrations

- Applied Genetics (BIAG)
- Applied Microbiology (BIMI)
- Animal Physiology and Behavior (BIAP)
- Ecology, Wildlife, & Conservation (BIWC)
- Integrative Biology (BIIB)
- Pre-Medical Professions (BIPM)

Program Requirements (54 hours)

This option for a major in biology requires a minimum of 54 hours in biology including 29-30 hours at the 300 or higher level. No minor is required. A range of upper-level courses are aligned with six concentrations offered within the major.

A baccalaureate degree requires a minimum of 120 unduplicated semester hours. More information can be found at www.wku.edu/registrar/degree_certification.php. (https://www.wku.edu/registrar/degree_certification.php)

Students who began WKU in the Fall 2014 and thereafter should review the Colonnade requirements located at: <https://www.wku.edu/colonnade/colonnaderequirements.php>. (<https://www.wku.edu/colonnade/colonnaderequirements.php>)

Code	Title	Hours
Required Courses		
BIOL 120 & BIOL 121	Biological Concepts: Cells Metabolism and Genetics and Biological Concepts: Cells, Metabolism, and Genetics Lab ¹	4
BIOL 122 & BIOL 123	Biological Concepts: Evolution, Diversity, and Ecology and Biological Concepts: Evolution, Diversity, and Ecology Lab ¹	4
BIOL 489	Professional Aspects of Biology	1

Required Supporting Courses

BIOL 382 or MATH 136 or MATH 183	Introductory Biostatistics Calculus I Introductory Statistics	3-4
CHEM 120 & CHEM 121	College Chemistry I and College Chemistry I Laboratory	5
PHYS 231 & PHYS 232	Introduction to Physics and Biophysics I and Laboratory for Physics and Biophysics I	4

Total Hours 21-22

Applied Genetics (BIAG) Concentration

Code	Title	Hours
Applied Genetics Core Courses		
BIOL 224 & BIOL 225	Animal Biology and Diversity and Animal Biology and Diversity Lab	4
BIOL 327 & BIOL 337	Genetics and Genetics Laboratory	4
BIOL 316	Evolution: Theory and Process	3
BIOL 312	Bioinformatics	4
BIOL 319 or BIOL 382 or BIOL 411	Introduction to Molecular and Cell Biology Introductory Biostatistics Cell Biology	3
BIOL 403 or BIOL 495	Molecular Basis of Cancer Molecular Genetics	3

Applied Genetics Electives 12-13

Suggested electives, include at least one with an associated lab component*

BIOL 319	Introduction to Molecular and Cell Biology
BIOL 328	Immunology
BIOL 335	Neurobiology
BIOL 350	Introduction to Recombinant Genetics
BIOL 369	Internship in Biology
BIOL 382	Introductory Biostatistics
BIOL 399	Research in the Biological Sciences
BIOL 403	Molecular Basis of Cancer
BIOL 407	Virology
BIOL 411	Cell Biology
BIOL 446	Biochemistry I
BIOL 450	Recombinant Gene Technology
BIOL 495	Molecular Genetics

Total Hours 33-34

Applied Microbiology (BIMI) Concentration

Code	Title	Hours
Applied Microbiology Core Courses		
BIOL 226 & BIOL 227	Microbial Biology and Diversity and Microbial Biology and Diversity Lab	4

BIOL 319 & BIOL 322	Introduction to Molecular and Cell Biology and Introduction to Molecular and Cell Biology Laboratory	4
BIOL 316	Evolution: Theory and Process	3
BIOL 312	Bioinformatics	4
BIOL 470	Pathogenic Microbiology	4
BIOL 328	Immunology	3
or BIOL 336	Food Microbiology	
or BIOL 472	Applied and Environmental Microbiology	
or BIOL 407	Virology	
Applied Microbiology Electives		11-12
Suggested electives *		
BIOL 328	Immunology	
BIOL 336	Food Microbiology	
BIOL 350	Introduction to Recombinant Genetics	
BIOL 369	Internship in Biology	
BIOL 399	Research in the Biological Sciences	
BIOL 407	Virology	
BIOL 446	Biochemistry I	
BIOL 450	Recombinant Gene Technology	
BIOL 472	Applied and Environmental Microbiology	
BIOL 495	Molecular Genetics	
Total Hours		33-34

Animal Physiology and Behavior (BIAP) Concentration

Code	Title	Hours
Animal Physiology and Behavior Core Courses		
BIOL 224 & BIOL 225	Animal Biology and Diversity and Animal Biology and Diversity Lab	4
BIOL 316	Evolution: Theory and Process	3
BIOL 327 & BIOL 337	Genetics and Genetics Laboratory	4
BIOL 330 & BIOL 331	Animal Physiology and Animal Physiology Laboratory	4
BIOL 334	Animal Behavior	3
BIOL 335	Neurobiology	3
or BIOL 377	Animal Form and Function	
or BIOL 464	Endocrinology	
Animal Physiology and Behavior Electives		12-13
Suggested electives, include at least one with an associated lab component *		
BIOL 315	Ecology	
BIOL 321	Comparative Anatomy	
BIOL 335	Neurobiology	
BIOL 377	Animal Form and Function	
BIOL 382	Introductory Biostatistics	
BIOL 369	Internship in Biology	
BIOL 399	Research in the Biological Sciences	
BIOL 446	Biochemistry I	

BIOL 464	Endocrinology	
Total Hours		33-34

Ecology, Wildlife, & Conservation (BIWC)

Code	Title	Hours
Ecology, Wildlife, & Conservation Core Courses		
BIOL 222 & BIOL 223	Plant Biology and Diversity and Plant Biology and Diversity Lab	4
or BIOL 224 & BIOL 225	Animal Biology and Diversity and Animal Biology and Diversity Lab	
BIOL 315 & BIOL 355	Ecology and Ecology Lab	5
BIOL 316	Evolution: Theory and Process	3
BIOL 327 & BIOL 337	Genetics and Genetics Laboratory	4
BIOL 332 or BIOL 458	Principles of Wildlife Ecology Fisheries Management	3-4
BIOL 382	Introductory Biostatistics	3
Ecology, Wildlife, & Conservation Electives		10-11
Suggested electives, include at least one with an associated lab component *		
BIOL 325	Insect Biodiversity	
BIOL 332	Principles of Wildlife Ecology	
BIOL 326	Ornithology	
BIOL 369	Internship in Biology	
BIOL 399	Research in the Biological Sciences	
BIOL 348	Plant Taxonomy	
BIOL 456	Ichthyology	
BIOL 457	Herpetology	
BIOL 458	Fisheries Management	
BIOL 459	Mammalogy	
BIOL 477	Marine Biology	
BIOL 485	Field Biology	
BIOL 497	Aquatic Field Ecology	
Total Hours		33-34

Integrative Biology (BIIB) Concentration

Code	Title	Hours
BIOL 222 & BIOL 223	Plant Biology and Diversity and Plant Biology and Diversity Lab	4
or BIOL 224 & BIOL 225	Animal Biology and Diversity and Animal Biology and Diversity Lab	
or BIOL 226 & BIOL 227	Microbial Biology and Diversity and Microbial Biology and Diversity Lab	
BIOL 319 & BIOL 322	Introduction to Molecular and Cell Biology and Introduction to Molecular and Cell Biology Laboratory	4
or BIOL 327 & BIOL 337	Genetics and Genetics Laboratory	
BIOL 315	Ecology	3
or BIOL 316	Evolution: Theory and Process	
Laboratory Experience Courses (Select Two) *		
BIOL 212	Genome Discovery Exploration	

BIOL 312	Bioinformatics
BIOL 321	Comparative Anatomy
BIOL 322	Introduction to Molecular and Cell Biology Laboratory
BIOL 325	Insect Biodiversity
BIOL 331	Animal Physiology Laboratory
BIOL 337	Genetics Laboratory
BIOL 338	Immunology Lab
BIOL 348	Plant Taxonomy
BIOL 350	Introduction to Recombinant Genetics
BIOL 355	Ecology Lab
BIOL 356	Ornithology Lab
BIOL 404	Techniques and Theory of Electron Microscopy
BIOL 412	Cell Biology Laboratory
BIOL 447	Biochemistry Laboratory
BIOL 450	Recombinant Gene Technology
BIOL 456	Ichthyology
BIOL 457	Herpetology
BIOL 458	Fisheries Management
BIOL 470	Pathogenic Microbiology
BIOL 472	Applied and Environmental Microbiology
BIOL 485	Field Biology
BIOL 496	Plant Biotechnology
BIOL 497	Aquatic Field Ecology
Science Process Courses (Select One) *	
BIOL 212	Genome Discovery Exploration
BIOL 312	Bioinformatics
BIOL 331	Animal Physiology Laboratory
BIOL 350	Introduction to Recombinant Genetics
BIOL 355	Ecology Lab
BIOL 397	Scientific Process
BIOL 404	Techniques and Theory of Electron Microscopy
BIOL 407	Virology
BIOL 412	Cell Biology Laboratory
BIOL 456	Ichthyology
BIOL 457	Herpetology
BIOL 470	Pathogenic Microbiology
BIOL 495	Molecular Genetics
BIOL 496	Plant Biotechnology
BIOL 497	Aquatic Field Ecology
HON 404	Honors Thesis / Project II
Total Hours	11

Pre-Medical Professions (BIPM) Concentration

Code	Title	Hours
Pre-Medical Professions Core Courses		
BIOL 224 & BIOL 225	Animal Biology and Diversity and Animal Biology and Diversity Lab	4
or BIOL 226 & BIOL 227	Microbial Biology and Diversity and Microbial Biology and Diversity Lab	
BIOL 316	Evolution: Theory and Process	3
BIOL 319 & BIOL 322	Introduction to Molecular and Cell Biology and Introduction to Molecular and Cell Biology Laboratory	4
or BIOL 327 & BIOL 337	Genetics and Genetics Laboratory	
BIOL 330 & BIOL 331	Animal Physiology and Animal Physiology Laboratory	4
or BIOL 411 & BIOL 412	Cell Biology and Cell Biology Laboratory	
or BIOL 397	Scientific Process	
BIOL 321	Comparative Anatomy	3-4
or BIOL 328	Immunology	
or BIOL 382	Introductory Biostatistics	
or BIOL 446	Biochemistry I	
Pre-Medical Professions Electives		13-16
Suggested electives, include at least one with an associated lab component *		
BIOL 319	Introduction to Molecular and Cell Biology	
BIOL 327	Genetics	
BIOL 328	Immunology	
BIOL 330	Animal Physiology	
BIOL 335	Neurobiology	
BIOL 321	Comparative Anatomy	
BIOL 369	Internship in Biology	
BIOL 382	Introductory Biostatistics	
BIOL 397	Scientific Process	
BIOL 399	Research in the Biological Sciences	
BIOL 411	Cell Biology	
BIOL 446	Biochemistry I	
BIOL 467	Biochemistry II	
BIOL 464	Endocrinology	
BIOL 470	Pathogenic Microbiology	
Total Hours		32-35

¹ Must complete with a grade of "C" or better.

² Elective Coursework:

- In consultation with their advisor, students select majors-level coursework to obtain a minimum of 54 credits total, provided that at least 30 hours total are upper-division courses.
- Students may count up to 6 credit hours of a combination of BIOL 369 and/or BIOL 399, and up to 4 credits of BIOL 485 toward this major.

- Professional Programs have additional course requirements beyond those listed in PMP Concentration. Consult with Pre-health advisors.

* The following BIOL courses will not count towards the BIOL electives nor the Biology major requirements: BIOL 113, BIOL 114, BIOL 131, BIOL 231, BIOL 207, BIOL 208, BIOL 295, BIOL 303.

Finish in Four Plan

First Year			
Fall	Hours	Spring	Hours
BIOL 120 & BIOL 121		4 BIOL 122 & BIOL 123	4
MATH 116 (or higher)		3 MATH 117 (or higher)	3
ENG 100		3 CHEM 120 & CHEM 121	5
Colonnade - Explorations		3 Colonnade - Explorations	3
	13		15
Second Year			
Fall	Hours	Spring	Hours
BIOL 222 & BIOL 223 (or BIOL 224/225 or BIOL 226/227)		4 BIOL 319 & BIOL 322 (or BIOL 327/337)	4
BIOL Science Supporting Course		4 ENG 200	3
HIST 101 or HIST 102		3 BIOL Science Supporting Course	4
BIOL upper-division Elective with lab		4 BIOL upper-division Elective with lab	4
	15		15
Third Year			
Fall	Hours	Spring	Hours
BIOL 315 or BIOL 316		3 BIOL upper-division Elective with lab	4
COMM 145		3 BIOL upper-division Elective with lab	4
Colonnade - Explorations		3 BIOL upper-division Elective	3
Colonnade - Explorations		3 Colonnade - Writing in the Disciplines	3
BIOL upper-division Elective with lab		4 Colonnade - Explorations	3
	16		17
Fourth Year			
Fall	Hours	Spring	Hours
BIOL 489		1 BIOL upper-division Elective	4
BIOL upper-division Elective		4 BIOL upper-division Elective	4
Colonnade - Connections		3 BIOL upper-division Elective	4
World Language or Elective		3 Colonnade - Connections	3
BIOL Process Elective (see Biology advisor)		3	
	14		15
Total Hours 120			