B.S. IN BIOLOGY - ECOLOGY AND CONSERVATION CONCENTRATION

Curriculum

Code	Title	Credits
GENERAL EDUCATION REQUIREMENTS (https://catalog.wcupa.edu/undergraduate/general-education-requirements/)		
Academic Foundations		
First Year Experience requirement		4
English Composition requirement		6-7
Mathematics requirement		3-4
MAT 121	Introduction to Statistics I	
or MAT 125	Introduction to Statistics and Probability	
Interdisciplinary requirement		3
Diverse Communities requirement		3
Ethics requirement		3
Distributed Disciplinary Foundations		
Science requirement		6-8
CHE 103	General Chemistry I	
PHY 130	General Physics I	
Behavioral & Social Science requirement		6
Humanities requirement		6
Arts requirement		3
ADDITIONAL BACCALAUREATE REQUIREMENTS (https://catalog.wcupa.edu/undergraduate/general-education-requirements/)		
University Requirements		
Writing Emphasis requirement		9
Speaking Emphasis requirement		9
Degree Requirements		
Capstone requirement		1-15
MAJOR REQUIREMENTS		
Core Courses		
BIO 110	General Biology I [1]	4
BIO 111	General Biology II [1]	4
BIO 210	Genetics [1]	3
BIO 210L	Genetics Lab [1]	1
BIO 211	Cell Biology [1]	4
CHE 103	General Chemistry I	3
CRL 103	General Chemistry I Lab	1
CHE 104	General Chemistry II	3
CRL 104	General Chemistry II Lab	1
CHE 231	Organic Chemistry I	4
CRL 231	Organic Chemistry I Lab	2
PHY 130	General Physics I [2]	4
or PHY 170	Physics I	
PHY 140	General Physics II [2]	4
or PHY 180	Physics II	
MAT 121	Introduction to Statistics I	3
or MAT 125	Introduction to Statistics and Probability	
Select one semester of calculus		3-4
Other Required Courses		
BIO 270	Ecology [1]	3
BIO 310	Biostatistical Applications	3

Biology Electives		
Under advisement, select 15 credits from the following:		15
BIO 277	Vertebrate Ecology	
BIO 312	Marine Botany	
BIO 313	Marine Biology	
BIO 315	Terrestrial Ecosystem Ecology	
BIO 387	Invertebrate Zoology	
BIO 391	Research in Biology [3]	
BIO 392	Internship in Biology [3]	
BIO 412	Organic Evolution	
BIO 415	Tropical Ecology and Conservation	
BIO 453	Marine Mammals	
BIO 454	Mycology	
BIO 466	Plant Physiological Ecology	
BIO 470	Population Biology	
BIO 471	Wetlands	
BIO 473	Conservation Biology	
BIO 474	Microbial Ecology	
BIO 475	Plant Communities	
BIO 476	Freshwater Ecology	
BIO 477	Entomology	
BIO 478	Plant Evolution	
BIO 485	Systematic Botany	
Ecologically Relevant Courses		
Select 6 credits under advisement from the following list or select 2 additional courses from the Biology Electives listed above.		6
BIO 214	General Microbiology	
BIO 457	Functional Animal Morphology	
BIO 464	Microbial Physiology	
BIO 468	Comparative Vertebrate Physiology	
CHE 232	Organic Chemistry II	
CHE 321	Analytical Chemistry I	
CHE 403	Chemistry of the Environment	
CHE 424	Advanced Analytical Chemistry	
CRL 321	Analytical Chemistry I Lab	
CRL 424	Analytical Chemistry II Lab	
ECO 385	Environmental & Resource Economics	
ENV 324	Environmental Sustainability	
ENV 447	Environmental Regulations	
ENV 451	Environmental Toxicology	
ENV 462	Water Quality and Health	
ESS 301	Environmental Geochemistry	
ESS 330	Introduction to Oceanography	
ESS 332	Advanced Oceanography	
ESS 336	Environmental Geology	
ESS 343	Geomorphology	
ESS 435	Remote Sensing	
ESS 439	Hydrogeology	
ESS 490	Soils and Engineering Geology	
GEO 225	Introduction to Maps and Remote Sensing	
GEO/PLN 316	GIS for Climate Monitoring, Hazards, and Emergency Management	
GEO 324	Intro to Geographic Information Systems	

GEO 332	Environmental Crises	
GEO 336	Environmental Planning	
GEO 338	Environmental Application of Geographic Information Systems (GIS)	
GEO 341	Landscape Ecology	
GEO 401	Internet Mapping	
GEO 402	Topical Seminar	
GEO 424	Geographic Information Systems Application	
PLN 320	Land Use Planning	
PSC 354	Sustainability Politics and Policy	
PSY/ANT 230	Introduction to Primatology	
PSY 335	Animal Behavior	
PSY 336	Animal Behavior Laboratory	
PSY 490	Topical Seminar in Psychology	
Capstone Requirement		
Select one of the following: [4]		3
BIO 490	Capstone: Seminar in Biology [1,5]	
BIO 491	Capstone: Independent Research in Biology [1,5]	
BIO 492	Capstone: Professional Development in Biology [1,5]	
Total Minimum Credits Required		**120**

1 Courses must be passed with a grade of C- (70%) or better.
2 The recommended Physics sequence is PHY 130 & PHY 140. Students may substitute the PHY 170 & PHY 180 sequence, but PHY 130 may not be used as a prerequisite for PHY 180 and PHY 170 may not be used as a prerequisite for PHY 140.
3 A maximum of 3 combined credits from BIO 391 and BIO 392 may be applied to the total BIO credits.
4 The requirement for BIO 490/BIO 491/BIO 492 is waived for students in the Accelerated (B.S. + M.S.) program. It is replaced by an additional 3 credits of biology electives. Students not completing a thesis (BIO 608-BIO 610) will be required to complete BIO 490/BIO 491/BIO 492.
5 This course fulfills the Capstone requirement.

Accelerated B.S. in Biology - Ecology and Conservation Concentration to M.S. in Biology Program

To be considered for the accelerated program and enroll in BIO 608 (Thesis Research I), students must have attained (completed) 75 credits with a minimum of 18 biology credits. Students must have a minimum cumulative GPA of 3.00 including a minimum GPA of 3.00 for biology courses. BIO 608 requires departmental permission to enroll; students must arrange a committee meeting prior to enrolling in BIO 608 (e.g., during their third year). The accelerated program in biology is only open to thesis students. Any student wishing to switch out of the thesis option will be required to complete all requirements of the B.S. degree. Once matriculated into the graduate program, graduate policies apply, including minimum GPA (3.00). *See the Graduate Catalog for further details.*

Students in the M.S. Biology program are required to take 21 credits of electives from the following three categories, 12 credits of which will be used to satisfy the B.S. program. Students may not, under any circumstances, take any additional graduate courses beyond the 12 graduate credits until conferral of their undergraduate degree.

Code	Title	Credits
Core Requirements		
BIO 510	Graduate Seminar in Biology	
BIO 511	Experimental Design and Analysis	3
BIO 520	Topics and Research Methods in Cellular, Microbial, and Molecular Biology	
BIO 521	Topics and Research Methods in Ecology, Evolution, and Organismal Biology	
Electives		
Select nine credits of electives from the following options:		9
Any other 500-level biology course, with the exception of BIO 591.		
Up to six credits of 400-level biology courses, where no 500-level course is available.		
Up to six credits of graduate course work from another department or university, pending prior departmental approval.		
Electives may not be repeats of courses unless the course topic changed significantly.		
Research and Capstone [1]		
BIO 608	Thesis Proposal [2]	3
BIO 609	Thesis Research [3]	3
BIO 610	Thesis and Defense [4]	3
Total Minimum Credits Required		**30**

1 Part-time students will be required to take the same group of courses as full-time students except they must complete BIO 608 by the end of their third year. As with the full-time students, part-time students cannot sign up for BIO 609 unless they have obtained a letter grade for BIO 608. In addition, they must sign up for BIO 610 by the start of their sixth year and complete it by the end of that year.
2 A thesis committee must have been formed, met with the student to discuss course work and research ideas, and the "Committee Composition" form needs to have been completed and submitted to the graduate coordinator in Biology at least 1 week prior to the start of the semester, before the student may be enrolled in BIO 608.
3 A letter grade must be assigned for BIO 608 before the student may be enrolled in BIO 609. All paperwork must be filed at least 1 week prior to the start of the semester the student wants to conduct BIO 609 work.
4 A letter grade must be assigned for BIO 609 before the student may be enrolled in BIO 610. All paperwork must be filed at least 1 week prior to the start of the semester the student wants to conduct BIO 610 work. To complete BIO 610 successfully, the student must present the thesis research in an open seminar and also pass a final thesis defense before the thesis committee. The degree will not be awarded until the student's committee has accepted the thesis and signed by the dean of The Graduate School.

Sample Course Plan

To track their individual degree progress, students are advised to access their Degree Audit via RamPortal regularly. For more information, visit the Degree Audit FAQ webpage (https://www.wcupa.edu/academicEnterpriseSystems/student-system-modernization/degree-audit-faqs.aspx).

The following is a sample suggested course sequence for this program; course offerings and availability are not guaranteed. Students should consult their academic advisor with any questions.

Course	Title	Credits
Year One		
Semester One		
BIO 110	General Biology I	4
CHE 103 & CRL 103	General Chemistry I and General Chemistry I Lab	4
WRT 120	Effective Writing I	3
FYE 100X	First Year Experience	4
	Credits	**15**
Semester Two		
BIO 111	General Biology II	4
CHE 104 & CRL 104	General Chemistry II and General Chemistry II Lab	4
MAT 121 or MAT 125	Introduction to Statistics I [1] or Introduction to Statistics and Probability	3
WRT 2XX	200-Level WRT Course	3
Behavioral & Social Science Gen Ed		3
	Credits	**17**
Year Two		
Semester Three		
BIO 210 & 210L	Genetics and Genetics Lab [2]	4
CHE 231 & CRL 231	Organic Chemistry I and Organic Chemistry I Lab	6
Humanities & Ethics Gen Ed		3
Arts Gen Ed		3
	Credits	**16**
Semester Four		
BIO 211	Cell Biology [2]	4
BIO 270	Ecology [2]	3
MAT 145 or MAT 143 or MAT 161	Calculus for the Life Sciences or Brief Calculus or Calculus I	3-4
BIO Ecology Elective		3
Behavioral & Social Science Gen Ed		3
	Credits	**16-17**
Year Three		
Semester Five		
PHY 130	General Physics I	4
BIO Ecology Elective		3
Diverse Communities Gen Ed		3
Directed Elective		3
	Credits	**13**
Semester Six		
BIO 310	Biostatistical Applications	3
PHY 140	General Physics II	4
BIO Ecology Elective		3
Interdisciplinary Gen Ed		3
Speaking Emphasis Gen Ed		3
	Credits	**16**
Year Four		
Semester Seven		
BIO Ecology Elective		3
Ecology-Related Elective		3
Humanities Gen Ed		3
Directed Elective (if needed)		3
Upper-Level Directed Elective		3
	Credits	**15**
Semester Eight		
BIO 490 or BIO 491 or BIO 492	Capstone: Seminar in Biology or Capstone: Independent Research in Biology or Capstone: Professional Development in Biology	3
BIO Ecology Elective		3
Ecology-Related Elective		3
Directed Elective (if needed)		3
	Credits	**12**
	Total Credits	**120-121**

[1] Students should take Statistics (MAT 121 or MAT 125) in the first year.

[2] All required 200-level biology courses should be completed by the end of Semester #5.