

B. S. IN BIOLOGY: ECOLOGY AND CONSERVATION CONCENTRATION

Fall 2022 – Spring 2023

I. ACADEMIC FOUNDATIONS & DEGREE REQUIREMENTS

<i>Requirement</i>	<i>Course</i>	<i>Credits</i>	<i>Term</i>	<i>Year</i>	<i>Grade</i>
First Year Experience	FYE 100	4	_____	_____	_____
Effective Writing I	WRT 120	3	_____	_____	_____
Effective Writing II	WRT 2__ [▲]	3	_____	_____	_____
Mathematics: Statistics	MAT 121 ⁺ or 125 ⁺	3	_____	_____	_____
Interdisciplinary (“I”)	_____	3	_____	_____	_____
Diverse Communities (“J”)	_____♥	3	_____	_____	_____
Ethics (“ET”)	_____♥	3	_____	_____	_____

Writing Emphasis (“W”) *Nine credits[▲], integrated across General Education & Major courses.*

BIO 211

One at 300/400-level:

Speaking Emphasis (“SE”) *Nine credits[▲], integrated across General Education & Major courses.*

One at 300/400-level:

BIO 490

II. GENERAL EDUCATION DISTRIBUTIVE REQUIREMENTS

- Courses must be selected from the approved General Education list (see the [catalog](#)).
- Interdisciplinary (“I”) courses cannot also be a General Education distributive course.
- Biology majors fulfill their science requirements with CHE 103 and PHY 130/170.
- Distributive requirements can be simultaneously satisfied with other degree requirements, see some examples[♦].

A. Humanities (6 credits): E.g., Literature (LIT/CLS), History (HIS), Philosophy (PHI)

Courses must be selected from two different subject areas.

_____	3	_____	_____	_____
_____	3	_____	_____	_____

B. Behavioral and Social Sciences (6 credits): E.g., Psychology (PSY), Sociology (SOC), Anthropology (ANT), Political Science (PSC), Geography (GEO), Economics (ECO)

Courses must be selected from two different subject areas.

Note: Students taking the MCAT should take PSY 100 and SOC 100.

_____	3	_____	_____	_____
_____	3	_____	_____	_____

C. Arts (3 credits): E.g., Art (ART), Art History (ARH), Dance (DAN), Film (FLM), Music (MHL, MTC), Theater (THA)

_____	3	_____	_____	_____
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III. DIRECTED ELECTIVES – 13 credits (as many as needed to reach 120 total credits)

_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

IV. SUPPORTING COURSES (28-29 credits)

Calculus ⁺ *	MAT _____	3	_____	_____	_____
General Chemistry I	CHE 103	3	_____	_____	_____
General Chemistry I Lab	CRL 103	1	_____	_____	_____
General Chemistry II	CHE 104	3	_____	_____	_____
General Chemistry II Lab	CRL 104	1	_____	_____	_____
Organic Chemistry I	CHE 231	4	_____	_____	_____
Organic Chemistry I Lab	CRL 231	2	_____	_____	_____
Organic Chemistry II	CHE 232	3	_____	_____	_____
General Physics I **	PHY 130	4	_____	_____	_____
General Physics II	PHY 140	4	_____	_____	_____

V. BIOLOGY COURSES (40 credits) -- GPA must be 2.0 or higher to graduate.

A. Required Core Courses (19 credits)

General Biology I ***	BIO 110	4	_____	_____	_____
General Biology II ***	BIO 111	4	_____	_____	_____
Genetics ***	BIO 210	3	_____	_____	_____
Genetics Lab ***	BIO 210L	1	_____	_____	_____
Cell Biology ***	BIO 211	4	_____	_____	_____
Seminar or Internship or Independent Study *** [△]	BIO 490/491/492	3	_____	_____	_____

B. Other Required Courses (6 credits)

General Ecology ***	BIO 270	3	_____	_____	_____
Biostatistical Applications	BIO 310	3	_____	_____	_____

C. Biology Electives[△] (15 credits)

_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

Biology Electives to be selected from

BIO 275	Field Botany	BIO 466	Plant Physiology
BIO 277	Vertebrate Ecology	BIO 470	Population Biology
BIO 312	Marine Botany	BIO 471	Wetlands
BIO 313	Marine Biology	BIO 473	Conservation Biology
BIO 315	Terrestrial Ecosystem Ecology	BIO 474	Microbial Ecology
BIO 377	Entomology	BIO 475	Plant Communities
BIO 387	Invertebrate Zoology	BIO 476	Freshwater Ecology
BIO 412	Organic Evolution	BIO 478	Plant Evolution
BIO 415	Tropical Ecology & Conservation	BIO 485	Systematic Botany
BIO 453	Marine Mammals	BIO 491	Research in Biology
BIO 454	Mycology	BIO 492	Internship in Biology

VI. OTHER ECOLOGY-RELATED ELECTIVES (6 credits)

To be chosen under advisement from Biology Department approved list below. Student-originated requests to use a course not on the list to fulfill this requirement must be signed by their Advisor, then by the Department Chair.

Department of Biology		Department of Earth & Space Science	
Any Biology Ecology Elective (above)		ESS 301	Environmental Geochemistry
BIO 214	General Microbiology	ESS 330	Introduction to Oceanography
BIO 457	Functional Animal Morphology	ESS 332	Advanced Oceanography
BIO 464	Microbial Physiology	ESS 336	Environmental Geology
BIO 468	Comparative Vertebrate Physiology	ESS 343	Geomorphology
		ESS 435	Remote Sensing
Department of Chemistry		ESS 439	Hydrogeology
CHE 321	Analytical Chemistry I	ESS 490	Fundamentals of Soil
CHE 403	Chemistry of the Environment		
CHE 424	Advanced Analytical Chemistry	Department of Geography & Planning	
CRL 321	Analytical Chemistry I Lab	GEO 214	Introduction to Planning
CRL 424	Analytical Chemistry II Lab	GEO 225	Introduction to Maps & Remote Sensing
		GEO 230	Environmental Conservation & Sustainability
Department of Health		GEO 324	Introduction to GIS
ENV 447	Environmental Regulations	GEO 332	Environmental Crises
ENV 451	Environmental Toxicology	GEO 336	Environmental Planning
ENV 462	Water Quality and Health	GEO 338	Environmental Applications of GIS
		GEO 341	Landscape Analysis
Department of Psychology		GEO 401	Internet Mapping
PSY 335	Animal Behavior	GEO 402	Field Methods in Environmental Geography
PSY 336	Animal Behavior Lab	GEO 424	GIS Applications
PSY 490	Course Topics: Primate Behavior & Culture	PLN 320	Land Use Planning
ANT/PSY 230	Introduction to Primatology		
		Department of Political Science	
		PSC 354	Environmental Politics & Policy

Notes and Requirements

Total degree program: 120 credits.

♠ The second (200-level) WRT course is chosen from WRT 200, 204, 205, 206, 208, or 220.

♥ The Diverse Communities (“J”) course and the Ethics (“ET”) courses can be satisfied through another requirement (e.g., Interdisciplinary or Distributive) as long as the course carries the appropriate attribute(s). *Note:* Credits are not duplicated such that if a course satisfies two requirements, those credits must be made up via directed electives (the minimum total credits for a B.S. degree is 120).

♣ All students must take at least 9 credits of Writing Emphasis courses and 9 credits of Speaking Emphasis courses. Students who enter WCU with 40-70 transfer credits only need 6 credits of each; students who enter with >70 transfer credits only need 3 credits of each. **All students must take at least 3 credits of Writing Emphasis and 3 credits of Speaking Emphasis at the 300-400 level.**

♦ Students should think about how requirements can be simultaneously satisfied. As examples: LNC 110 is a Humanities distributive that satisfies the Ethics requirement; PHI 180 is a Humanities distributive that satisfies the Diverse Communities & Ethics requirements; LIT 165 is a Humanities distributive that is also Writing Emphasis; PSC 101 is a Behavioral & Social Science distributive that satisfies the Diverse Communities requirement.

+ All student will need to complete the Math Placement Exam before they can enroll in MAT courses. For information, please visit the link below. Please direct any questions to mathexam@wcupa.edu.
<https://www.wcupa.edu/sciences-mathematics/mathematics/mathematicsPlacement.aspx>

* The Biology department recommends MAT 145 (Calculus for the Life Sciences; 3 credits) or MAT 161 (Calculus I; 4 credits). MAT 143 (Brief Calculus; 3 credits) is also acceptable. You must meet the necessary pre-requisites or obtain a minimum score on the Math Placement Exam to enroll in a calculus class. Visit the Math Department website to take the exam. If you receive a score of 3 or lower on the placement exam, you must take MAT 115 (Algebra, Functions, and Trigonometry) or MAT 131 (Precalculus) as preparation for Calculus (MAT 143 or MAT 145). If a student scores a 2 or lower, they will need to take MAT Q30 before they can enroll in MAT 115 or MAT 131. Students can repeat the mathematics assessment to improve their score. If you receive a score of 4 or above, you can enroll directly into MAT 143 or MAT 145. You must score a 5 to enroll into MAT 161 or take the pre-requisite of MAT 131.

** 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.

*** Course must be passed with a "C-" or better.

△ Students may only do one capstone course (BIO 490/491/492). Students using BIO 491/492 must be aware that they are fulfilling a capstone requirement, the credits will not also count as Biology electives. A maximum of 3 combined credits from BIO 391 and BIO 392 may be applied to the total BIO credits.

Suggested Sequence for B.S. Biology Majors
Ecology and Conservation Concentration
 Fall 2022 – Spring 2023

_____	Semester #1 (15 credits) FYE 100 (4) WRT 120 (3) BIO 110 (4) CHE 103 (3) & CRL 103 (1)	_____	Semester #2 (17 credits) WRT 2____ (3) BIO 111 (4) CHE 104 (3) & CRL 104 (1) MAT 125 or MAT 121 (3) Gen Ed Distributive: Behavioral & Social Science (3)
_____	Semester #3 (16 credits) BIO 210 (3) & BIO 210L (1) CHE 231 (4) & CRL 231 (2) Gen Ed Distributive: Humanities & Ethics (ET) course (3) Gen Ed Distributive: Arts (3)	_____	Semester #4 (16-17 credits) BIO 211 (W) (4) BIO 270 (3) CHE 232 (3) MAT 145 (3) or MAT 143 (3) /161 (4) Gen Ed Distributive: Behavioral & Social Science (3)
_____	Semester #5 (13 credits) BIO ECOLOGY Elective (3) PHY 130 (4) Diverse Communities Course (J) (3) Directed Elective (W) (3)	_____	Semester #6 (16 credits) BIO 310 (3) BIO ECOLOGY Elective (3) PHY 140 (4) Interdisciplinary Course (I) (3) Speaking Emphasis Course (SE) (3)
_____	Semester #7 (15 credits) BIO ECOLOGY Elective (3) BIO ECOLOGY Elective (3) Ecology-related Elective (3) Upper-level Directed Elective (W) (3) Gen Ed Distributive: Humanities (3)	_____	Semester #8 (12 credits) BIO ECOLOGY Elective (3) Ecology-related Elective (3) Directed Elective (3) (if needed) BIO 490/491/492 (SE) (3)

All required 200 level Biology courses should be completed by the end of Semester #5. Students should take Statistics (MAT 121 or 125) in the first year.

All students must take at least 9 credits of Writing Emphasis courses and 9 credits of Speaking Emphasis courses. Students who enter WCU with 40-70 transfer credits only need 6 credits of each; students who enter with >70 transfer credits only need 3 credits of each. **All students must take at least 3 credits of Writing Emphasis and 3 credits of Speaking Emphasis at the 300-400 level.**