

B. S. IN BIOLOGY: ECOLOGY AND CONSERVATION CONCENTRATION

Fall 2019 – Spring 2020

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 *Nine credits**, integrated across General Education & Major courses.

<u>BIO 220</u>	_____	_____	_____	_____
<i>One at 300/400-level:</i>	_____	_____	_____	_____

Speaking Emphasis *Nine credits**, integrated across General Education & Major courses.

_____	_____	_____	_____	_____
<i>One at 300/400-level:</i>	_____	_____	_____	_____

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 200.

_____	3	_____	_____	_____
_____	3	_____	_____	_____

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

_____	3	_____	_____	_____
-------	---	-------	-------	-------

III. DIRECTED ELECTIVES – 14-15 credits (as many as needed to reach 120 total credits)

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

IV. SUPPORTING COURSES (28-29 credits)

Calculus *	MAT	3/4	_____	_____	_____
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 (39 credits) -- GPA must be 2.0 or higher to graduate.

A. Required courses (24 credits)

General Biology ***	BIO 110	3	_____	_____	_____
General Botany ***	BIO 215	3	_____	_____	_____
General Zoology ***	BIO 217	3	_____	_____	_____
Cell Physiology ***	BIO 220	3	_____	_____	_____
Genetics ***	BIO 230	3	_____	_____	_____
General Ecology ***	BIO 270	3	_____	_____	_____
Biostatistical Applications	BIO 310	3	_____	_____	_____
Seminar or Internship or Independent Study*** [△]	BIO 490/409/491	3	_____	_____	_____

B. Biology Electives (15 credits)

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

Biology Electives to be selected from:

BIO214	General Microbiology	BIO453	Marine Mammals
BIO275	Field Botany	BIO454	Mycology
BIO277	Vertebrate Ecology	BIO466	Plant Physiology
BIO312	Marine Botany	BIO470	Population Biology
BIO313	Marine Biology	BIO471	Wetlands
BIO315	Terrestrial Ecosystem Ecology	BIO473	Conservation Biology
BIO377	Entomology	BIO474	Microbial Ecology
BIO387	Invertebrate Zoology	BIO475	Plant Communities
BIO409	Internship in Biological Sciences	BIO476	Freshwater Ecology
BIO412	Organic Evolution	BIO478	Plant Evolution
BIO415	Tropical Ecology and Conservation	BIO485	Systematic Botany
BIO435	Global Climate Change	BIO491	Special Problems in Biology

VI. OTHER ECOLOGY-RELATED ELECTIVES (6-7 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 Electives (above)		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	Fundamental of Soil
CHE 403	Chemistry of the Environment		
CHE 424	Advanced Analytical Chemistry	Department of Geography & Planning	
CRL 321	Experimental Analytical Chemistry I	GEO 214	Introduction to Planning
CRL 424	Advanced Analytical Chemistry Lab	GEO 225	Introduction to Maps & Remote Sensing
		GEO 230	Environmental Conservation & Sustainability
Department of Health		GEO 320	Land Use Planning
ENV 451	Environmental Toxicology	GEO 324	Introduction to GIS
ENV 462	Water Quality and Health	GEO 332	Environmental Crises
		GEO 336	Environmental Planning
Department of Psychology		GEO 338	Environmental Applications of GIS
PSY 335	Animal Behavior	GEO 341	Landscape Analysis
PSY 336	Animal Behavior Lab	GEO 401	Internet Mapping
PSY 490	Course Topics: Primate Behavior & Culture	GEO 402	Field Methods in Environmental Geography
ANT/PSY 230	Introduction to Primatology	GEO 424	GIS Applications

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.

* 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 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 using BIO 409 to fill this requirement must be aware that using three credits in a required Biology course (section V - A) will not also count as three credits towards a Biology elective (section V - B). Check with your academic advisor if you are unsure of credit usage. A maximum of 8 combined credits from BIO 409 & 491 may be applied to the total BIO elective credits.

Suggested Sequence for B.S. Biology Majors Ecology and Conservation Concentration

Fall 2019 – Spring 2020

	Semester #1 (17 credits)		Semester #2 (16 credits)
_____	FYE 100 (4)	_____	WRT 2____ (3)
_____	WRT 120 (3)	_____	BIO 215 or 217 (3)
_____	BIO 110 (3)	_____	CHE 104/CRL 104 (3)/(1)
_____	CHE 103/CRL 103 (3)/(1)	_____	MAT 145 (3) or MAT 143/161
_____	MAT 121 or MAT 125 (3)	_____	Gen Ed Distributive: Behavioral & Social Science (3)
	Semester #3 (15 credits)		Semester #4 (15 credits)
_____	BIO 215 or 217 (3)	_____	BIO 220 (3) (W)
_____	CHE 231/CRL 231 (4)/(2)	_____	BIO 270 (3)
_____	Math (if still needed) (3)	_____	CHE 232 (3)
_____	Gen Ed Distributive: Humanities & Ethics (ET) course (3)	_____	Gen Ed Distributive: Arts (3)
_____		_____	Gen Ed Distributive: Behavioral & Social Science (3)
	Semester #5 (16 credits)		Semester #6 (16 credits)
_____	BIO 230 (3)	_____	BIO 310 (3)
_____	PHY 130/170 (4)	_____	BIO ECOLOGY Elective (3)
_____	Diversity (J) Course (3)	_____	PHY 140/180 (4)
_____	BIO ECOLOGY Elective (3)	_____	Interdisciplinary (I) Course (3)
_____	Directed Elective (3)	_____	Directed Elective (3)
	Semester #7 (15 credits)		Semester #8 (15 credits)
_____	BIO ECOLOGY Elective (3)	_____	BIO ECOLOGY Elective (3)
_____	BIO ECOLOGY Elective (3)	_____	BIO ECOLOGY Elective (3)
_____	Ecology-related Elective (3)	_____	Ecology-related Elective (3)
_____	Directed Elective (3)	_____	Directed Elective (3) (if needed)
_____	Gen Ed Distributive: Humanities (3)	_____	BIO 490/409/491 (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.**