

# ACCELERATED PROGRAM - B. S. IN BIOLOGY: ECOLOGY AND CONSERVATION CONCENTRATION + M. S. IN BIOLOGY

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__ <sup>▲</sup>	3	_____	_____	_____
Mathematics: Statistics	MAT 121 or 125	3	_____	_____	_____
Interdisciplinary (“I”)	_____	3	_____	_____	_____
Diverse Communities (“J”)	_____♥	3	_____	_____	_____
Ethics (“ET”)	_____♥	3	_____	_____	_____

**Writing Emphasis** *Nine credits<sup>▲</sup>, integrated across General Education & Major courses.*

BIO 220

*One at 300/400-level:*

**Speaking Emphasis** *Nine credits<sup>▲</sup>, integrated across General Education & Major courses.*

*One at 300/400-level:*

## 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<sup>♦</sup>.*

**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	_____	_____	_____
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### III. DIRECTED ELECTIVES – 17 credits (to reach 120 total credits for the B.S. degree)

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

### IV. SUPPORTING COURSES (28 credits)

Calculus *	MAT 145	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 (42 credits; 30 credits taken at the undergraduate level, 12 credits taken at graduate level are applied to the B.S.) Must have 3.00 GPA for graduate admission.

#### A. Required courses (21 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	_____	_____	_____

#### B. Biology Ecology Electives (3 credits; must be selected from list below)

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

C. Ecology-related Electives (6 credits; must be selected under advisement from list below)

Dep.	Subscript	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
			ESS 439 Hydrogeology
			ESS 490 Fundamental of Soil
		<b>Department of Chemistry</b>	
CHE 321		Analytical Chemistry I	
CHE 403		Chemistry of the Environment	
CHE 424		Advanced Analytical Chemistry	<b>Department of Geography &amp; Planning</b>
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
		<b>Department of Health</b>	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
		<b>Department of Psychology</b>	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

## VI. GRADUATE COURSES <sup>Δ</sup>

### A. Core courses (12 credits)

Graduate Seminar in Biology	BIO 510	3	_____	_____	_____
Experimental Design and Analysis	BIO 511	3	_____	_____	_____
Topics & Methods in Cellular, Microbial, and Molecular Biology	BIO 520	3	_____	_____	_____
Topics & Methods in Ecology, Evolution, and Organismal Biology	BIO 521	3	_____	_____	_____

### B. Electives <sup>§</sup> (9 credits)

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

### C. Research and Capstone <sup>Σ</sup> (9 credits)

Thesis Proposal	BIO 608	3	_____	_____	_____
Thesis Research	BIO 609	3	_____	_____	_____
Thesis and Defense	BIO 610	3	_____	_____	_____

## Notes and Requirements

The Accelerated B.S. + M.S. program is only open to thesis students. Students should begin discussing research topics with prospective faculty advisors during the 2<sup>nd</sup> year in preparation for application to the accelerated program during their 3<sup>rd</sup> year.

Credit requirements: B.S.: 120 credits; M.S.: 30 credits. Twelve credits taken at the graduate level are also applied to the B.S. degree. Therefore the total for both degrees is 138 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.

Δ - To be considered for the accelerated program and enroll in BIO 608 (Thesis Proposal), 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 admitted to the graduate program, graduate policies apply, including minimum GPA (3.00). *See the Graduate Catalog for further details.*

ξ – Any other 500-level BIO course except BIO 591. If a course is offered at both the 400 and 500 levels, the student must take the 500-level course. No more than 6 credits of 400-level courses may be counted toward the M.S. degree. With prior departmental approval, up to 6 credits of graduate course work from another department or university may be applied toward the M.S. degree. BIO 535, 536, and 537 may be repeated for credit provided the topic is different.

Σ - A letter grade must be obtained for BIO 608 before the student can enroll in BIO 609. Likewise, a letter grade must be obtained for BIO 609 before the student can enroll in BIO 610.

# Suggested Sequence for Accelerated B.S. + M.S. Biology Majors

## Ecology & Conservation Concentration

Fall 2019 – Spring 2020

_____	<b>Semester #1 (17 credits)</b> FYE 100 (4) WRT 120 (3) BIO 110 (3) CHE 103/CRL 103 (3)/(1) MAT 121 or MAT 125 (3)	_____	<b>Semester #2 (16 credits)</b> WRT 2____ (3) BIO 215 or 217 (3) CHE 104/CRL 104 (3)/(1) MAT 145 (3) or MAT 143/161 Gen Ed Distributive: Behavioral & Social Science (3)
_____	<b>Semester #3 (15 credits)</b> BIO 215 or 217 (3) CHE 231 (4) CRL 231 (2) Gen Ed distributive: Humanities & Ethics (ET) course (3) Diversity (J) elective (3)	_____	<b>Semester #4 (15 credits)</b> BIO 220 (3) (W) BIO 270 (3) CHE 232 (3) Gen Ed distributive: Arts (3) Gen Ed distributive: Behavioral & Social Science (3)
_____	<b>Semester #5 (16 credits)</b> BIO 230 (3) BIO Ecology elective (3) PHY 130/170 (4) Gen Ed distributive: Humanities (3) Directed elective (3)	_____	<b>Semester #6 (16 credits)</b> BIO 310 (3) Ecology-related elective (3) PHY 140/180 (4) Interdisciplinary (I) elective (3) Directed elective (3)
_____	<b>Semester #7 <sup>Δ</sup> (14 credits)</b> BIO 510 (3) BIO 520 (3) Directed elective (3) Directed elective (2) BIO 608 <sup>Δ</sup> (3)	_____	<b>Semester #8 (15 credits)</b> Ecology-related elective (3) BIO 511 (3) BIO 521 (3) Directed elective (3) Directed elective (3)
_____	<b>Semester #9 (9 credits)</b> BIO elective (3) (Graduate) BIO elective (3) (Graduate) BIO 609 (3)	_____	<b>Semester #10 (6 credits)</b> BIO elective (3) (Graduate) BIO 610 (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.**