

B. S. IN BIOLOGY: ECOLOGY AND CONSERVATION CONCENTRATION

Fall 2020– Spring 2021

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 220

One at 300/400-level: _____

Speaking Emphasis (“SE”) *Nine credits**, 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♦.

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

III. DIRECTED ELECTIVES – 14-15 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 (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.

+ 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 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 2020– Spring 2021

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