

B. S. IN BIOLOGY: ECOLOGY AND CONSERVATION CONCENTRATION

Fall 2023 – Spring 2024

I. ACADEMIC FOUNDATIONS & DEGREE REQUIREMENTS

| Requirement | Course | Credits | Term | Year | Grade |
|---------------------------|--|---------|-------|-------|-------|
| 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 | _____ | _____ | _____ |
|-------|---|-------|-------|-------|

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)

Any Biology Electives from the list above may also be used to satisfy this requirement. 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 2023 – Spring 2024

| | | | |
|-------|---|-------|--|
| _____ | 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.**