

COURSE REQUIREMENTS FOR BACHELOR OF SCIENCE IN ECOLOGY

- A. THE GENERAL EDUCATION AND TOTAL UNIVERSITY CREDIT REQUIREMENTS MUST BE MET. NOTE: See General Education Goals for a B.S. degree (ISU Catalog). 128 total minimum credits are required for graduation. 36 of these must be upper division credits.
- B. COURSES IN BIOLOGICAL SCIENCES: NUMBER OF CREDITS
- EITHER THESE TWO COURSES**
- | | | |
|----------|------------|---|
| BIOL 101 | Biology I | 4 |
| BIOL 102 | Biology II | 4 |
- OR THESE FOUR COURSES**
- | | | |
|-----------|---------------------|---|
| BIOL 202 | General Zoology | 3 |
| BIOL 202L | General Zoology Lab | 1 |
| BIOL 203 | General Botany | 3 |
| BIOL 203L | General Botany Lab | 1 |
- AND THESE COURSES**
- | | | |
|--|--|-----|
| BIOS 192 | Ecology Seminar | 1 |
| BIOS 206/207 | Cell Biology and Lab | 4 |
| BIOS 209 | General Ecology and Lab | 4 |
| BIOS 303 OR | Principles of Animal Physiology | 4 |
| BIOS 304 | Elements of Plant Physiology | 4 |
| BIOS 315 | Introduction to Biometry | 3 |
| BIOS 317 | Organic Evolution | 3 |
| BIOS 318 | Ecological Topics | 1-3 |
| BIOS 337 | Conservation of Natural Resources | 3 |
| BIOS 358 | General Genetics | 3 |
| BIOS 489 | Field Ecology | 3 |
| BIOS 491 or 492 | Senior Seminar | 1 |
| BIOS 496 | Ecology Senior Seminar | 1 |
| Biological Science Electives (Upper division): | | |
| BIOS XXX | Ecology Courses (2 required)
(Bios 408, 416, 452, 459, 462, 476) | 6 |
| BIOS 320 | Physiology Ecology | 3 |
| BIOS XXX | Natural History and Systematics (1 required)
(Bios 309, 310, 311, 312, 426, 427, 431, 438, 441) | 2-4 |
- Additional courses in Biological Sciences that are highly recommended, but not required:
(to be taken in the area of ecology)
- | | | |
|----------|----------------------|----------------------|
| BIOS 481 | Independent Problems | (additional credits) |
| BIOS 482 | Independent Problems | (additional credits) |
| BIOS 493 | Senior Thesis | (additional credits) |
- C. COURSES IN MATHEMATICS
- | | | |
|------------------------------|----------------|---|
| MATH 147 | Precalculus | 5 |
| (OR MATH 143 <u>and</u> 144) | | |
| MATH 160 | Brief Calculus | 4 |
- D. COURSES IN CHEMISTRY
- | | | |
|----------------|--|-------|
| CHEM 111 | General Chemistry I | 5 |
| CHEM 112 | General Chemistry II | 4 |
| CHEM 301 & 303 | Organic Chemistry I and Organic Chem I Lab | 3 & 1 |
| CHEM 302 & 304 | Organic Chemistry II and Organic Chem II Lab | 3 & 1 |
- E. COURSES IN PHYSICS
- | | | |
|----------|--------------------|---|
| PHYS 111 | General Physics I | 3 |
| PHYS 112 | General Physics II | 3 |
- F. COURSES IN GEOLOGY
- | | | |
|-----------|---|---|
| GEOL 109 | Physical Geology for Scientists (or Geol 101) | 3 |
| GEOL 101L | Physical Geology Lab | 1 |
- G. COURSES IN AREA OF CONCENTRATION OUTSIDE OF THE DEPARTMENT OF BIOLOGICAL SCIENCES: Students should take a minimum of 9 credits in a single area of concentration outside the Department of Biological Sciences, e.g., business, computer science, political science, etc.

RECOMMENDED COURSE SELECTION - ECOLOGY MAJOR
Bachelor of Science

Fall Semester

Spring Semester

For Students Who Qualify to take Math 147 During their First Semester							
Freshman Year							
¹ Biol 101	Biology I	4	cr	¹ Biol 102	Biology II	4	cr
² MATH 147	Precalculus	5	cr	MATH 160	Brief Calculus	4	cr
	or MATH 107 <u>and</u> MATH 144			BIOS 192	Ecology Seminar	1	cr
ENGL 101	English Composition	3	cr	COMM 101	Principles of Speech	2	cr
⁴ General Education Requirements		<u>3</u>	cr	⁴ General Education Requirements		<u>6</u>	cr
		15	cr			17	cr
Sophomore Year							
BIOS 209	General Ecology	4	cr	³ GEOL 101	Physical Geology	3	cr
CHEM 111	General Chemistry I	5	cr	GEOL 101L	Physical Geology Lab	1	cr
PHYS 111	General Physics I	3	cr	CHEM 112	General Chemistry II	4	cr
ENGL 201	Critical Rdg & Wrtg	<u>3</u>	cr	PHYS 112	General Physics II	3	cr
		15	cr	⁴ General Education Requirements or			
				Electives		<u>6</u>	cr
						17	cr

For Students Who Qualify to take Math 160 During their First Semester							
Freshman Year							
¹ Biol 101	Biology I	4	cr	¹ Biol 102	Biology II	4	cr
CHEM 111	General Chemistry I	5	cr	CHEM 112	General Chemistry II	4	cr
² MATH 160	Brief Calculus	4	cr	BIOS 192	Ecology Seminar	1	cr
	or MATH 107 <u>and</u> MATH 144			COMM 101	Principles of Speech	2	cr
ENGL 101	English Composition	<u>3</u>	cr	Electives		<u>4</u>	cr
		16	cr			15	cr
Sophomore Year							
BIOS 209	General Ecology	4	cr	³ GEOL 101	Physical Geology	3	cr
PHYS 111	General Physics I	3	cr	GEOL 101L	Physical Geology Lab	1	cr
ENGL 201	Critical Rdg & Wrtg	3	cr	PHYS 112	General Physics II	3	cr
⁴ General Education Requirements		3	cr	⁴ General Education Requirements		<u>9</u>	cr
Electives		<u>3</u>	cr			16	cr
		16	cr				

¹Or BIOL 202 (General Zoology), BIOL 202L (General Zoology Lab), BIOL 203 (General Botany) and BIOL 203L (General Botany Lab), 8 cr.

²Students with more than one year of High School Algebra should take the mathematics placement exam and enroll in MATH 160, if possible.

³It is recommended that Ecology majors take GEOL 109 in place of GEOL 101, if available.

⁴ECON 201-202 recommended. However, only 3 credits of 201-202 (6 credits) will apply toward the General Education Requirement.

Fall Semester

Spring Semester

If the Junior Year Starts in the Fall of an Even Year

CHEM 301	Organic Chemistry I	3	⁵ CHEM 302	Organic Chemistry II	3
CHEM 303	Organic Chemistry I Lab	1	CHEM 304	Organic Chemistry II Lab	1
BIOS 358	Genetics	3	BIOS 315	Biometry	3
BIOS 304	Plant Physiology	4	BIOS 303	Animal Physiology	4
	or elective if BIOS 303 in spring			or elective if BIOS 304 in fall	
Ecology Courses (2 required)			Ecology courses (2 required)		
BIOS 416			BIOS 438, 452		
Natural Hist. & Systematics Courses (1 required)			Natural Hist. & Systematics Courses (1 required)		
BIOS 309			BIOS 310, 312		
General Education Requirement			General Education Requirement		

If the Senior Year Starts in the Fall of an Odd Year

BIOS 491	Senior Seminar	1	BIOS 496	Ecology Senior Seminar	1
	or BIOS 496			or BIOS 492	
BIOS 320	Physiological Ecology	3	BIOS 317	Evolution	3
Ecology Courses (2 required)			BIOS 337	Cons. Nat. Resources	3
BIOS 459, 462			BIOS 315	Biometry	3
Natural Hist. & Systematics Courses (1 req.)			Ecology Courses (2 required)		
BIOS 311, 431			BIOS 408, 476		
General Education Requirement			Natural Hist. & Systematics Courses (1 req.)		
			BIOS 310, 312, 426, 427, 438		
General Education Requirement			General Education Requirement		

If the Junior Year Starts in the Fall of an Odd Year

CHEM 301	Organic Chemistry I	3	CHEM 302	Organic Chemistry II	3
CHEM 303	Organic Chemistry I Lab	1	CHEM 304	Organic Chemistry II Lab	1
BIOS 358	Genetics	3	BIOS 337	Cons. Nat. Resources	3
BIOS 320	Physiological Ecology	3			
BIOS 304	Plant Physiology	4	BIOS 303	Animal Physiology	4
	or elective if BIOS 303 in spring			or elective if BIOS 304 in fall	
Ecology Courses (2 required)			Ecology courses (2 required)		
BIOS 459, 462			BIOS 408, 476		
Natural History & Systematics Courses (1 req.)			Natural History & Systematics Courses (1 req.)		
BIOS 311, 431			BIOS 310, 312, 426, 427, 438		
General Education Requirement			General Education Requirement		

If the Senior Year Starts in the Fall of an Even Year

BIOS 491	Senior Seminar	1	BIOS 496	Ecology Senior Seminar	1
	or BIOS 496			or BIOS 492	
Ecology Courses (2 required)			BIOS 317	Evolution	3
BIOS 416			BIOS 489	Field Ecology	3
Natural History & Systematics Courses (1 required)			BIOS 315	Biometry	3
BIOS 309			Ecology Courses (2 required)		
General Education Requirement			BIOS 438, 452		
			Natural History & Systematics Courses (1 req.)		
			BIOS 310, 312		
General Education Requirement			General Education Requirement		

⁵Students can substitute CHEM 232 and 234 (Quantitative Analysis) for CHEM 302 & 304 (Organic Chemistry II).

DEPARTMENT OF BIOLOGICAL SCIENCES
Undergraduate Degree Program: BACHELOR OF SCIENCE IN ECOLOGY

Rational and Purpose:

This past decade has witnessed rapid and significant changes in both the needs and opportunities related to environmental biology and natural resource management. Concerns for environmental quality and the judicious use of natural resources have increased sharply. These concerns have been met, at least in part, by the enactment of numerous laws at the state and national levels. The most notable of these include the National Environmental Policy Act, the Clean Air Act, the Federal Water Pollution Control Act, the Forest and Rangeland Renewable Resources Planning Act, the National Forest Management Act, and the Federal Land Policy and Management Act. Paralleling these developments, opportunities for ecologists and field biologists in environmental assessment and monitoring, planning, and management have increased. In 1977, for the first time, the Life Sciences announcement of the U.S. Civil Service Commission included ECOLOGY among the professional positions described

It has become increasingly clear that the most critical environmental problems do not correspond neatly to traditional areas of differentiation and diverse and complex problems associated with accelerating use of resources demand a broad-based curriculum which provides a firm foundation in the physical and biological sciences with strength in the social sciences and humanities. Our ecology program seeks to meet such demands by developing 1) an understanding of ecological systems and their reactions to perturbations, 2) expertise in problem solving and communication skills, and 3) a solid background in basic ecology and supporting disciplines. The curriculum emphasizes environmental assessment and the collection and analysis of field data through in-depth studies of aquatic and terrestrial ecosystems. The curriculum was designed to meet the needs of students who are interested in environmental assessment planning, or conservation, or of those who wish to pursue advanced training in ecology or natural resource management.

The requirements for the Bachelor of Science in Ecology are shown below and on the following pages. The program provides sufficient flexibility to allow students to emphasize plant ecology, animal and population ecology or aquatic and fisheries ecology in their individual programs. Elective courses in supporting disciplines which students are encouraged to take include General Soils (Geology 417), and Environmental Economics (Economics 352).

No student shall have more than 50 hours of credit in his/her major field, unless he/she exceeds the 128 hours for the graduation requirements by at least the number of hours in excess of 50 taken in the major field.