

## Department of Biology



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Students may major in biology in a broad sense (selecting electives from course offerings in biology, botany, cellular/molecular biology, microbiology or zoology), or they may major in biology with an emphasis in botany, cellular/molecular biology, microbiology, pre-medical or zoology. Students may follow the specialized curriculum for the wildlife and fisheries sciences major. Teaching degrees with a secondary licensure are also available.

Also in the sciences is an interdisciplinary organization which offers programs in the Allied Health Sciences. These programs include a Bachelor of Science in Medical Technology and several pre-professional, pre-clinical programs. Students are referred to the section on Page 83 for Allied Health Sciences in this catalog for details on these programs.

Students who want to teach secondary school science in New Mexico may obtain a Bachelor of Science degree in Biology with a minor in Teaching of Natural Sciences to obtain a secondary science licensure. Students should check teacher education requirements and secondary science licensure requirements on Pages 47–48. Descriptions of BIOL courses begin on Page 109. Students in a major with licensure will complete the teaching degree General Education requirements as found on Page 45 and the professional education requirements listed on Page 47.

### Core, Emphasis and Elective Curricula in Biology (48–53 hours)

#### BIology Core Course Requirements (22 hours)

BIOL	151/L	General Biology I (4)
BIOL	152/L	General Biology II (4)
BIOL	214/L	Microbiology (4)
BIOL	222	Cell Biology (3)
BIOL	231	Genetics (3)
BIOL	303	General Ecology (3)
BIOL	492	Undergraduate Seminar (1)

#### Emphasis Course Requirements (18–23 hours)

##### Select one of the following emphases:

A. *General Biology* — A minimum of 21 credit hours in consultation with the academic advisor

##### B. *Botany*

BIOL	216	General Botany (3)
BIOL	303/L	General Ecology Lab (1)
BIOL	305	Evolution and Systematics (3)
BIOL	410/L	Plant Systematics (4)
BIOL	415/L	Plant Physiological Ecology (4)
BIOL	420/L	Plant Structure and Function (4)

Plus one course from *Zoology Electives List* at right (3–4)

##### C. *Cell, Molecular Biology, and Biotechnology*

BIOL	375	General Biotechnology (3)
BIOL	380	Endocrinology (3)
BIOL	409/L	Microbial Physiology (4)
BIOL	425/L	Molecular Biology (4)
BIOL	427/L	Developmental Biology (4)

##### D. *Microbiology*

BIOL	375	General Biotechnology (3)
BIOL	409/L	Microbial Physiology (4)
BIOL	421/L	Principles of Immunology (4)
BIOL	422/L	Medical Microbiology (4) <b>OR</b>
BIOL	425/L	Molecular Biology (4)
BIOL	427/L	Developmental Biology (4)
BIOL	450/L	Virology (4)

##### E. *Pre-Medical*

BIOL	209/L	Anatomy and Physiology I (4)
BIOL	210/L	Anatomy and Physiology II (4)
BIOL	380	Endocrinology (3)
BIOL	421/L	Principles of Immunology (4) <b>OR</b>
BIOL	422/L	Medical Microbiology (4)
BIOL	424/L	Advanced Human Physiology (4)

##### F. *Zoology*

BIOL	216	General Botany (3)
BIOL	300/L	Invertebrate Zoology (4)
BIOL	303/L	General Ecology Lab (1)
BIOL	305	Evolution and Systematics (3)

Plus two courses from *Zoology Electives List* below (7–8)

##### *Zoology Electives List*

BIOL	301/L	General Entomology (4)
BIOL	307/L	Vertebrate Zoology (4)
BIOL	341/L	Parasitology (4)
BIOL	411/L	Herpetology (4)
BIOL	418	Medical Entomology (3)
BIOL	430/L	Limnology and Freshwater Biology (4)
BIOL	431/L	Mammalogy (4)
BIOL	436/L	Ichthyology (4)
BIOL	442/L	Ornithology (4)

#### Elective Course Requirements (8 hours)

A minimum of eight upper-division credit hours in consultation with the academic advisor

**Degree:** Bachelor of Arts (BA) or  
Bachelor of Science (BS)  
**Major:** Biology

Core, Emphasis, and Elective Curricula in Biology (48–53 hours) (see Page 70)

#### Required courses in other areas (16 hours)

CHEM	151/L	General Chemistry I (4)
CHEM	152/L	General Chemistry II (4)
PHYS	151/L	General Physics (4)

Select one of the following:

CHEM	251/L	Integrated Organic and Biochemistry (4) <b>OR</b>
CHEM	341/L	Organic Chemistry I (4)

**Note:** The Biology faculty strongly recommends that pre-medical students also take CHEM 342/L (4), CHEM 401 (1) and CHEM 452 (3).

**Minor:** Biology (18–19 hours)

BIOL	151/L	General Biology I (4)
BIOL	152/L	General Biology II (4)
BIOL	214/L	Microbiology (4) <b>OR</b>
BIOL	222	Cell Biology (3)
BIOL	231	Genetics (3)
BIOL	303/L	General Ecology (4)

**Degree: Bachelor of Science (BS)**  
**Major: Wildlife and Fisheries Sciences**

**Note:** This degree does not require a minor. Furthermore, choices from this degree program include 33 hours of the 46–50 hours General Education requirements. General education choices are indicated with an asterisk (\*).

**Course Requirements (Important: Consult with your advisor about certification requirements for The Wildlife Society and the American Fisheries Society.)**

**a. Biology Core Course Requirements (50 hours)**

Any one course counts towards 3 hours of general education requirements in the Science category (IV).

BIOL 110	Introduction to Wildlife and Fisheries Sciences (3)
BIOL 151/L	General Biology I (4)*
BIOL 152/L	General Biology II (4)
BIOL 216	General Botany (3)
BIOL 231	Genetics (3)
BIOL 303/L	General Ecology (4)
BIOL 404/L	Fisheries Management (4)
BIOL 405/L	Wildlife Management (4)
BIOL 430/L	Limnology and Freshwater Biology (4)
BIOL 431/L	Mammalogy (4)
BIOL 436/L	Ichthyology (4)
BIOL 492	Undergraduate Seminar (1)

Select one of the following:

BIOL 300/L	Invertebrate Zoology (4)
BIOL 301/L	General Entomology (4)

Select one of the following:

BIOL 411/L	Herpetology (4)
BIOL 442/L	Ornithology (4)

**b. Elective Course Requirements (10 additional hours in biology)**

Select at least one botanical and one zoological course with the approval of your advisor. Recommended courses include:

BIOL 214/L	Microbiology (4)
BIOL 300/L	Invertebrate Zoology (4)
BIOL 301/L	General Entomology (4)
BIOL 305	Evolution and Systematics (3)
BIOL 307/L	Vertebrate Zoology (4)
BIOL 341/L	Parasitology (4)
BIOL 410/L	Plant Systematics (4)
BIOL 411/L	Herpetology (4)
BIOL 415/L	Plant Physiological Ecology (4)
BIOL 420/L	Plant Structure and Function (4)
BIOL 425/L	Molecular Biology (4)
BIOL 442/L	Ornithology (4)
BIOL 460/L	Landscape Ecology and GIS (4)

In addition, the following is recommended for students wishing to pursue a graduate degree:

BIOL 222	Cell Biology (3)
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**Required Courses in Other Areas**

**c. Physical Sciences (15 hours)**

Any one course from GEOL, CHEM or PHYS counts toward 3 hours of General Education requirements in the Science category (IV). **Note:** Students wishing to pursue a graduate degree should take at least one general chemistry and one general physics course.

Select courses from at least two areas:

**Physical Sciences Electives List**

**Geology**

GEOL 123/L	Earth Resources (4)
GEOL 151/L	Physical Geology (4)
GEOL 152/L	Historical Geology (4)

**Soils**

AG 204/L	Soil Science (3)
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**Chemistry**

CHEM 151/L	General Chemistry I (4)
CHEM 152/L	General Chemistry II (4)
CHEM 251/L	Integrated Organic and Biochemistry (4)
CHEM 341/L	Organic Chemistry I (4)
CHEM 342/L	Organic Chemistry II (4)

**Physics**

PHYS 141/L	Astronomy (4)
PHYS 151/L	General Physics (4)
PHYS 152/L	General Physics (4)
PHYS 201/L	Physics I (5)
PHYS 202/L	Physics II (5)

**d. Quantitative Sciences (10 hours)**

Ten hours of quantitative sciences from the Quantitative Sciences Electives List with at least two disciplines represented. \*Any two asterisked courses count toward 7 hours of General Education requirements in the Understanding and Applying Mathematical Principles category (II).

**Quantitative Sciences Electives List**

MATH 119	College Algebra (3)*
STAT 213	Statistical Methods I (4)*

Select one of the following:

MATH 124	Calculus I (4)*
STAT 313	Statistical Methods II (3)
STAT 414	Nonparametric Methods (3)
STAT 415	Survey Sampling Methods (3)
STAT 432	Statistical Packages (3)

**e. Humanities and Social Sciences (9 hours)**

Select three of the following courses from the Social Science and Humanities General Education categories (categories VI and VII). Your selection must include at least one course from category VI, no more than two courses from a single area in category VII and no more than one foreign language course from category VII. The three courses will count towards 9 hours of General Education requirements in categories VI and/or VII.

**Category VI: Social Science**

**Economics**

ECON 221	Principles of Macro Economics (3)
ECON 222	Principles of Micro Economics (3)

**Political Science**

PSCI 101	Introduction to Political Science (3)
PSCI 102	American National Government (3)

**Psychology**

PSY 101	Introductory Psychology (3)
PSY 134	Psychology of Adjustment (3)

**Sociology**

SOC 101	Introductory Sociology (3)
SOC 212	Contemporary Social Issues (3)

**Category VII: Humanities**

**History**

HIST 101	Survey of American History to 1877 (3)
HIST 102	Survey of American History since 1877 (3)
HIST 121	Survey of Western Civilization (3)
HIST 122	Survey of Western Civilization (3)
HIST 203	New Mexico (3)

**Humanities**

HUM 221	Introduction to World Humanities (3)
HUM 222	Introduction to Modern World Humanities (3)

**Literature**

ENG 201	Types of Literature (3)
ENG 211	Introduction to Literature (3)
ENG 221	British Literature Survey I (3)
ENG 222	British Literature Survey II (3)

**Foreign Language**

FR 101	Beginning French (4)
FR 102	Continuation of Beginning French (4)
FR 201	Intermediate French (3)
FR 202	Continuation of Intermediate French (3)
SPAN 101	Beginning Spanish (4)
SPAN 102	Continuation of Beginning Spanish (4)
SPAN 201	Intermediate Spanish (3)
SPAN 202	Continuation of Intermediate Spanish (3)

**f. Communication (12 hours)**

Any three asterisked courses count toward 9 hours of General Education requirements.

**Communications Electives List**

Select one of the following:

ENG 102	English Composition (3)*
ENG 108	English Composition (honors) (3)*

Select one of the following:

ENG 104	English Composition and Research (3)*
ENG 109	Composition and Research (honors) (3)*

Select one of the following:

COMM 101/L	Interpersonal Communication (3)*
COMM 102	Public Speaking (3)*
COMM 202	Dynamics of Group Behavior (3)

Select one of the following:

COMM	any additional course (3)
ENG 325	Professional and Technical Writing (3)
ENG 335	Creative Writing (3)
ENG 415	Expository Writing (3)
ENG 416	Report Writing (3)

**g. Policy, Administration, Law, Human Dimensions (6 hours)**

Select two of the following:

CJ 102	Introduction to Criminal Justice (3)
PSCI 321	Public Policy Process (3)
PSCI 332	Public Administration (3)
PSCI 410	Public Policy Issues (3)
SOC/CJ432	Police and Society (3)

**Minor: Wildlife and Fisheries Sciences (26 hours)**

BIOL 110	Introduction to Wildlife and Fisheries Sciences (3)
BIOL 151/L	General Biology I (4)
BIOL 152/L	General Biology II (4)
BIOL 231	Genetics (3)
BIOL 303/L	General Ecology (4)

**Applied Wildlife/Fisheries Course Requirement\* (4 hours)**

Select one of the following:

BIOL 404/L	Fisheries Management (4)
BIOL 405/L	Wildlife Management (4)

**Electives\* (4 hours)**

Select one of the following with advisor's approval:

BIOL 411/L	Herpetology (4)
BIOL 431/L	Mammalogy (4)
BIOL 436/L	Ichthyology (4)
BIOL 442/L	Ornithology (4)

\*Some courses may have prerequisites.

**Degree: Bachelor of Science (BS)****Major: Biology****Licensure: Secondary Science**

**Courses that must be chosen within the Teaching Degree General Education Requirements:**

**Course Requirements (19 hours)**

Fulfill the 12-hour science requirement by taking the following:

GEOL 151/L	Physical Geology (4)
GEOL 152/L	Historical Geology (4)
PHYS 151/L	General Physics (4)

Fulfill the 6-hour math requirement by taking the following:

MATH 119	College Algebra (3)
STAT 213	Statistical Methods I (4)

**Teaching Field Block (35–37 hours)**

BIOL 151/L	General Biology I (4)
BIOL 152/L	General Biology II (4)
BIOL 209/L	Anatomy and Physiology I (4)
BIOL 210/L	Anatomy and Physiology II (4)
BIOL 214/L	Microbiology (4)
BIOL 231	Genetics (3)

**Select one course from each of the four areas:**

**a. Molecular**

BIOL 409/L	Microbial Physiology (4)
BIOL 425/L	Molecular Biology (4)

**b. Morphology and Physiology**

BIOL 307/L	Vertebrate Zoology (4)
BIOL 415/L	Plant Physiological Ecology (4)
BIOL 420/L	Plant Structure and Function (4)

**c. Organismic**

BIOL 214/L	Microbiology (4)
BIOL 216	General Botany (3)
BIOL 301/L	General Entomology (4)
BIOL 431/L	Mammalogy (4)
BIOL 436/L	Ichthyology (4)
BIOL 442/L	Ornithology (4)

**d. Ecology**

BIOL 110	Introduction to Wildlife and Fisheries Sciences (3)
BIOL 303/L	General Ecology (4)
BIOL 305	Evolution and Systematics (3)
BIOL 415/L	Plant Physiological Ecology (4)
BIOL 430/L	Limnology and Freshwater Biology (4)

**Required Minor (22 hours)**

For Teaching of Natural Science course requirements for Biology, see below.

**Minor: Teaching of Natural Science**

**(To be used with Secondary Science Licensure Biology major)**

**Teaching Requirements (10 hours)**

BIOL 439	Teaching in Biology (1)
CHEM 439	Teaching in Chemistry (1)
GEOL 439	Teaching in Geology (1)
PHYS 439	Teaching in Physics (1)
SED 380	Secondary School Teaching/Learning (3)
SED 410	Issues in Secondary Teaching (3)

**Additional Science Courses (12 hours)**

CHEM 151/L	General Chemistry I (4)
CHEM 152/L	General Chemistry II (4)
PHYS 152/L	General Physics (4)

**Subject Matter Endorsement****Area/Minor: General Science****Licensure: Elementary**

Up to 12-hours of science coursework taken as part of the general education requirements may apply to the endorsement. Students must take the 151/L courses. See advisor to assist with the selection of electives.

**Required Courses (16 hours):**

BIOL	151/L	General Biology I (4)
CHEM	151/L	General Chemistry I (4)
GEOL	151/L	Physical Geology (4)
PHYS	151/L	General Physics (4)

**Electives (8 hours)**

BIOL	214/L	Microbiology* (4)
BIOL	216	General Botany* (3)
GEOL	410	Environmental Geology* (3)
GEOL	482	Geology of New Mexico* (2)
GEOL	484	Geology of Western National Parks (3)
PHYS	141/L	Astronomy (4)

Students wishing to pursue middle school licensure must take 12 of upper division courses (300/400-level). Other science courses with prior consent of advisor.

\*Requires prerequisites or consent of instructor.