



**Bachelor of Science
BIOLOGY**

The mission of the Program in Biology is to provide a first-rate education for undergraduates in the biological sciences. This mission is accomplished through high-quality instruction in the traditional classroom and in student-faculty research. The faculty recognize that student involvement is meaningful; participation in research is a critical component in a strong biology program. The program is committed to providing an excellent education in biology by helping students to acquire fundamental knowledge in biology spanning a wide range of biological disciplines, the ability to critically analyze information, the ability to recognize connections among different areas of biology and between biology and the liberal arts, and the ability to effectively communicate knowledge and ideas to others within and outside the field of biology.

Matriculation into this program is dependent upon: 1) your having been granted final regular admission to Northern; 2) your having a cumulative grade point average of at least 2.50 in all coursework attempted at Northern and/or other institutions; 3) your having completed 48 credits of college level work (excluding remedial courses), including the following required courses: BIOL 151/L, BIOL 201/L, BIOL 202/L, BIOL 203/L, BIOL 204/L, MATH 150, and CHEM 121/L, and CHEM 122/L; and 4) submission of a personal statement to the program director in which you outline your interest in biology and your career goals.

GENERAL EDUCATION REQUIREMENTS (35 crs)

COMPLETED

**Planned Timeline
(By Semester)**

Communications (9 crs)

ENG 111 English Composition I (3)

Prerequisite: ENG 109 or adequate score on the Course Placement Evaluation

SPCH 130 Public Speaking (3)

Prerequisite: ENG 109 or adequate score on the Course Placement Evaluation

Choose **one** of the following courses:

ENG 112 English Composition II (3)

Pre-requisite: ENG 111

ENG 116 Technical Writing (3)

Pre-requisite: ENG 111

Mathematics (3 crs)

MATH 150 College Algebra (3)

Pre-requisite: MATH 130

Laboratory Sciences (8 crs)

BIOL 201 Introduction to Molecular and Cell Biology (3)

Prerequisite/Co-requisite: CHEM 121/L; Co-requisite: BIOL 201L

BIOL 201L Introduction to Molecular and Cell Biology Lab (1)

Co-requisite: BIOL 201

CHEM 121 General Chemistry I (3)

Prerequisite: MATH 130, high school chemistry or ACT score of 19 or higher in Natural Science;

Co-requisite: CHEM 121L

CHEM 121L General Chemistry I Lab (1)

Co-requisite: CHEM 121

Social/Behavioral Sciences (6-9 crs)*

Pre-requisite: ENG 109 or adequate score on the Course Placement Evaluation

You must select survey courses from *at least two different discipline areas* from the following list:

ANTH 101/L Physical Anthropology w/Lab (4)

ANTH 102 Introduction to Social and Cultural Anthropology (3)

ANTH 111 Language and Culture (3)

ANTH 207 Cultures of New Mexico (3)

GEOG 111 World Geography (3)

PSCI 110 The Political World (3)

PSCI 200 American Politics (3)

PSY 105 General Psychology (3)

SOC 101 Introduction to Sociology (3)

SOC 220 Social Problems (3)

SOC 225 Marriage and the Family (3)

	COMPLETED	Planned Timeline (By Semester)
ENG 111 English Composition I (3)	_____	_____
SPCH 130 Public Speaking (3)	_____	_____
ENG 112 English Composition II (3)	_____	_____
ENG 116 Technical Writing (3)	_____	_____
MATH 150 College Algebra (3)	_____	_____
BIOL 201 Introduction to Molecular and Cell Biology (3)	_____	_____
BIOL 201L Introduction to Molecular and Cell Biology Lab (1)	_____	_____
CHEM 121 General Chemistry I (3)	_____	_____
CHEM 121L General Chemistry I Lab (1)	_____	_____
ANTH 101/L Physical Anthropology w/Lab (4)	_____	_____
ANTH 102 Introduction to Social and Cultural Anthropology (3)	_____	_____
ANTH 111 Language and Culture (3)	_____	_____
ANTH 207 Cultures of New Mexico (3)	_____	_____
GEOG 111 World Geography (3)	_____	_____
PSCI 110 The Political World (3)	_____	_____
PSCI 200 American Politics (3)	_____	_____
PSY 105 General Psychology (3)	_____	_____
SOC 101 Introduction to Sociology (3)	_____	_____
SOC 220 Social Problems (3)	_____	_____
SOC 225 Marriage and the Family (3)	_____	_____

Humanities and Fine Arts (6-9 crs) *

Pre-requisite: ENG 109 or adequate score on the Course Placement Evaluation

PHIL 220 Ethics (3)

In addition, you must select survey courses from *at least one other discipline area* from the following list:

ART 105	Introduction to Art (3)	_____	_____
ART 107	History of Art (3)	_____	_____
ENG 262	Southwest Literature (3)	_____	_____
<i>Pre-Requisite: ENG 112</i>			
ENG 265	Native American Literature I (3)	_____	_____
<i>Pre-Requisite: ENG 111</i>			
ENG 266	Native American Literature II (3)	_____	_____
<i>Pre-Requisite: ENG 111</i>			
ENG 270	Children’s Literature (3)	_____	_____
<i>Pre-Requisite: ENG 111</i>			
ENG 280	Readings in Literature (3)	_____	_____
<i>Pre-Requisite: ENG 111</i>			
ENG 290	Study of Literature (3)	_____	_____
<i>Pre-Requisite: ENG 111</i>			
ENG 294	Mythology (3)	_____	_____
<i>Pre-Requisite: ENG 111</i>			
HIST 101	Western Civilization I (3)	_____	_____
HIST 102	Western Civilization II (3)	_____	_____
HIST 161	History of the U.S. to 1877 (3)	_____	_____
HIST 162	History of the U.S. from 1877 (3)	_____	_____
HIST 260	History of New Mexico (3)	_____	_____
HUM 101	Humanities I (3)	_____	_____
HUM 102	Humanities II (3)	_____	_____
MUS 105	Music Appreciation (3)	_____	_____
PHIL 110	Intro to Philosophical Problems (3)	_____	_____
THE 120	Introduction to Theatre I (3)	_____	_____
<i>Co-requisite: THE 150</i>			
THE 130	History of Theatre (3)	_____	_____
THE 220	Introduction to Theatre II (3)	_____	_____
<i>Prerequisite: THE 120/150</i>			
THE 238	Teatro Chicano (3)	_____	_____

*** You must complete at least 15 crs between these two areas, maintaining at least two disciplines in each area.**

Health, Physical Education & Recreation (1 crs)

Elective (1) _____

PROGRAM REQUIREMENTS (77 crs)

Biology Core Curriculum (44 crs)

Required 100 and 200 level sequence (16 credits; BIOL 201/L is included in the Gen Ed sequence))

BIOL 151/L	Science and Society (4)	_____	_____
BIOL 202/L	Genetics (4)	_____	_____
<i>Pre-requisite: BIOL 201/L</i>			
BIOL 203/L	Ecology and Evolution (4)	_____	_____
<i>Pre-requisite: BIOL 201/L-202/L, CHEM 121/L-122/L; Co-requisite: MATH 162</i>			
BIOL 204/L	Plant and Animal Form and Function (4)	_____	_____
<i>Pre-requisite: BIOL 201/L-203/L, CHEM 121/L-122/L</i>			

Required Seminar, Research Experience and Capstone project (5 crs)

BIOL 392	Undergraduate Research Experience (3)	_____	_____
BIOL 472	Biology Seminar (1)	_____	_____
BIOL 492	Biology Capstone Project (1)	_____	_____

Two required 300 level courses to be chosen from the following list (8 crs)

BIOL 329	Molecular Cell Biology (4)	_____	_____
<i>Pre-requisite: BIOL 201/L- 204/L</i>			
BIOL 349/L	Essentials of Anatomy and Physiology (3)	_____	_____
<i>Pre-requisite: BIOL 201/L- 204/L or BIOL 237/L-238/L</i>			
BIOL 351/L	General Microbiology (3)	_____	_____
<i>Pre-requisite: BIOL 201/L- 204/L</i>			
BIOL 360/L	Plant Biology (3)	_____	_____
<i>Pre-requisite: BIOL 201/L- 204/L</i>			

BIOL 371/L	Invertebrate Biology (3)	_____	_____
<i>Pre-requisite: BIOL 201/L- 204/L</i>			
BIOL 386/L	General Vertebrate Zoology (3)	_____	_____
<i>Pre-requisite: BIOL 201/L- 204/L; Co-requisite: BIOL 386L</i>			
<u>Four 400 level courses to be chosen from the following list (15 crs)</u>			
BIOL 406	Stream Ecology and Field Methods (3)	_____	_____
<i>Pre-requisite: BIOL 203/L or ES 112/L or ES 125</i>			
BIOL 410	Bioinformatics (3)	_____	_____
<i>Pre-requisite: BIOL 201/L- 204/L</i>			
BIOL 412	Developmental Biology (3)	_____	_____
<i>Pre-requisite: BIOL 201/L- 204/L ; Co-requisite: BIOL 412L</i>			
BIOL 412L	Developmental Biology (1)	_____	_____
<i>Pre-requisite: BIOL 201/L- 204/L ; Co-requisite: BIOL 412</i>			
BIOL 416	Cells and Tissues (3)	_____	_____
<i>Pre-requisite: BIOL 201/L- 204/L ; Co-requisite: BIOL 416L</i>			
BIOL 416L	Cells and Tissues Laboratory (1)	_____	_____
<i>Pre-requisite: BIOL 201/L- 204/L ; Co-requisite: BIOL 416</i>			
BIOL 418	Conservation Biology	_____	_____
<i>Pre-requisite: BIOL 2013/L- 204/L ; Co-requisite: BIOL 416</i>			
BIOL 422	Comparative Vertebrate Anatomy (3)	_____	_____
<i>Pre-requisite: BIOL 201/L- 204/L ; Co-requisite: BIOL 422L</i>			
BIOL 422L	Comparative Vertebrate Anatomy Laboratory (1)	_____	_____
<i>Pre-requisite: BIOL 201/L- 204/L ; Co-requisite: BIOL 422</i>			
BIOL 425	Molecular Genetics (3)	_____	_____
<i>Pre-requisite: BIOL 201/L- 204/L ; Co-requisite: BIOL 425L</i>			
BIOL 425L	Molecular Genetics Laboratory (1)	_____	_____
<i>Pre-requisite: BIOL 201/L- 204/L ; Co-requisite: BIOL 425</i>			
BIOL 426	Neurobiology (3)	_____	_____
<i>Pre-requisite: BIOL 201/L- 204/L ; Co-requisite: BIOL 426L</i>			
BIOL 426	Neurobiology Laboratory (1)	_____	_____
<i>Pre-requisite: BIOL 201/L- 204/L ; Co-requisite: BIOL 426</i>			
BIOL 431	Drugs and Their Actions (3)	_____	_____
<i>Pre-requisite: BIOL 201/L- 204/L; CHEM 210/L</i>			
BIOL 435	Comparative Animal Physiology (3)	_____	_____
<i>Pre-requisite: BIOL 201/L- 204/L ; Co-requisite: BIOL 435L</i>			
BIOL 435L	Comparative Animal Physiology Laboratory (1)	_____	_____
<i>Pre-requisite: BIOL 201/L- 204/L ; Co-requisite: BIOL 435</i>			
BIOL 451	General Ecology (3)	_____	_____
<i>Pre-requisite: BIOL 201/L- 204/L ; Co-requisite: BIOL 451L</i>			
BIOL 451L	General Ecology laboratory (1)	_____	_____
<i>Pre-requisite: BIOL 201/L- 204/L ; Co-requisite: BIOL 451</i>			
BIOL 456	Immunology (3)	_____	_____
<i>Pre-requisite: BIOL 201/L- 204/L ; Co-requisite: BIOL 456L</i>			
BIOL 456L	Immunology Laboratory (1)	_____	_____
<i>Pre-requisite: BIOL 201/L- 204/L ; Co-requisite: BIOL 456</i>			
BIOL 467	Evolutionary Plant Ecology (3)	_____	_____
<i>Pre-requisite: BIOL 451/L</i>			

Required Supportive Courses in Math, Physics and Chemistry (33 crs)

Mathematics (14 crs)

MATH 145	Introduction to Probability and Statistics (3)	_____	_____
<i>Pre-requisite: MATH 130</i>			
MATH 155	Trigonometry (3)	_____	_____
<i>Pre-requisite: MATH 130</i>			
MATH 162	Calculus I (4)	_____	_____
<i>Pre-requisite: MATH 155</i>			
MATH 163	Calculus II (4)	_____	_____
<i>Pre-requisite: MATH 162</i>			

Chemistry (11 crs; CHEM 121/L is taken under Gen Ed requirements)

CHEM 122	General Chemistry II (3)	_____	_____
<i>Pre-requisite: CHEM 121/L; Co-requisite: CHEM 122L</i>			
CHEM 122L	General Chemistry II Lab (1)	_____	_____

Co-requisite: CHEM 122

CHEM 210 Integrated Organic and Biochemistry (3)

Co-requisite: CHEM 210L

CHEM 210L Integrated Organic and Biochemistry Lab (1)

Co-requisite: CHEM 210

CHEM 341 Survey of Biochemistry (3)

Pre-requisite: CHEM 210/L

Physics (8 crs)

PHYS 121/L Applied Physics I (3)

Pre-requisite: MATH 130;

PHYS 122/L Applied Physics II (3)

Pre-requisite: PHYS 121/L

MINOR CONCENTRATIONS

You **may** choose one of the following minor concentrations (16 crs):

Mathematics (16 crs)

MATH 264 Calculus III (4)

MATH 311 Vector Analysis (3)

MATH 312 Linear Analysis (3)

MATH 314 Differential Equations (3)

MATH 316 Partial Differential Equations (3)

Chemistry (16 crs)

CHEM 301 Organic Chemistry I (3)

CHEM 301L Organic Chemistry I Lab (1)

CHEM 302 Organic Chemistry II (3)

CHEM 302L Organic Chemistry II Lab (1)

CHEM 311 Physical Chemistry (3)

CHEM 311L Physical Chemistry Lab (1)

Electives (4 hrs): Choose **four** additional upper-division credits in chemistry

Physics (16 crs)

PHYS 262 General Physics (3)

PHYS 262L General Physics Lab (1)

PHYS 302 Optics (3)PHYS 330 Introduction to Modern Physics (3)

PHYS 331 Thermodynamics and Statistical Mechanics (3)

PHYS 405 Electricity and Magnetism (3)

IF YOU DO NOT CHOOSE A MINOR CONCENTRATION

You must choose 16 more credit hours, at least 13 at the upper division level, from elective courses in biology, chemistry, mathematics, physics, humanities, or the social and behavioral sciences.

TOTAL CREDIT HOURS 129

Educational Planning Form (Semester)

Name _____ Date _____

Major _____ Student ID _____

Fall Semester	Spring Semester	Summer
Total Units	Total Units	Total Units
Fall Semester	Spring Semester	Summer
Total Units	Total Units	Total Units
Fall Semester	Spring Semester	Summer
Total Units	Total Units	Total Units

Advisor's Signature _____

Student Signature _____