

# NORTHERN



AMENDED 2015-16 Catalog (Revised 1/2/16)

## Bachelor of Science BIOLOGY

This program prepares you to pursue a graduate degree in biology or to go on to professional schools in the health sciences. Training in biology also prepares you for a wide variety of career choices, including careers in research in academic, government, and private research laboratories, science teaching, positions in the biomedical, biotechnology, and pharmaceutical industries, and other related fields. While many positions are open to those holding a BS degree, some may only be open to those holding advanced graduate degrees.

### 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, including the following required courses: BIOL 110/L, BIOL 201/L, BIOL 202/L, BIOL 203/L, and BIOL 204/L, CHEM 121/L, CHEM 122/L, and MATH 150; 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 (38 CR) SEE PAGES 26-29.

Courses listed under each area are specific requirements for the BS in Biology that also fulfill the requirements for General Education. See pages 26-29 in the Course Catalog for additional courses to meet the required credits in each area.

#### Area I. Communications (9 cr)

- ENG 111 English Composition I (3)  
SPCH 130 Public Speaking (3)

#### Area II. Mathematics (3 cr)

- MATH 150 College Algebra (3)

#### Area III. Laboratory Sciences (8 cr)

- BIOL 110/L Current Topics in Biology with lab (4)  
CHEM 110/L Introduction to Chemistry with lab (4)

#### Area IV. Social/Behavioral Sciences (6-9 cr)

#### Area V. Humanities and Fine Arts (6-9 cr)

- PHIL 220 Ethics (3)

*\* You must complete at least 15 credits between areas IV and V, Social/Behavioral Science and Humanities/Fine Arts, maintaining at least two disciplines in each area.*

#### Area VI. First Year Experience (3 cr)

- FYE 101 First Year Experience (3)

### PROGRAM REQUIREMENTS (86 CR)

#### ☐ Biology Core Curriculum (20 cr)

- BIOL 201/L Introduction to Molecular and Cell Biology with Lab (4)  
BIOL 202/L Principles of Genetics with Lab (4)  
BIOL 203/L Ecology and Evolution with Lab (4)  
BIOL 204/L Plant and Animal Form and Function with Lab (4)  
BIOL 329 Cellular and Molecular Biology (4)

#### ☐ Seminar and Research Experience (7 cr)

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

▣ **Supportive Courses in Math, Chemistry, and Physics (35 cr)**

**Mathematics (11 cr)**

MATH	145	Introduction to Probability and Statistics (3)
MATH	155	Trigonometry and Pre-Calculus (4)
MATH	162	Calculus I (4)

**Chemistry (16 cr)**

CHEM	121/L	General Chemistry I with lab (4)
CHEM	122/L	General Chemistry II with lab (4)
CHEM	301/L	Organic Chemistry I with lab (4)
CHEM	421/L	Biochemistry with lab (4)

**Physics (8 cr)**

PHYS	121/L	Applied Physics I with lab (4)
PHYS	122/L	Applied Physics II with lab (4)

▣ **Additional Program Requirements (24)**

The *remaining 24 credit hours MUST* be upper division (300-400). Please seek departmental advisement to tailor your course selections to your individual career objectives. The following courses are suggestions from each discipline. *Note:* Course selection must be approved by BIOL program advisor and Chair of the department.

***Suggested Areas of Concentration:***

**Cellular and Molecular Biology**

BIOL	410	Bioinformatics (3)
BIOL	412/L	Developmental Biology with lab (4)
BIOL	416/L	Cells and Tissues with lab (4)
BIOL	425	Molecular Genetics (4)
BIOL	426/L	Neurobiology with lab (4)
BIOL	431	Drugs and Their Actions (3)
BIOL	456	Immunology (4)
MATH	345	Elements of Mathematical Statistics and Probability Theory (3)

**Ecology and Evolution**

BIOL	371/L	Invertebrate Biology with lab (4)
BIOL	360/L	Plant Biology with lab (4)
BIOL	386	Vertebrate Biology (4)
BIOL	406	Stream Ecology and Field Methods (4)
BIOL	451/L	General Ecology with lab (4)
BIOL	467	Evolutionary Plant Ecology (3)
ES	308	Invasive Species (3)
ES	420	Ecology and Hydrology of the Southwest (3)
MATH	345	Elements of Mathematical Statistics and Probability Theory (3)

**Supportive Courses in Math, Chemistry, and Physics**

CHEM	302/L	Organic Chemistry II with lab (4)
CHEM	311	Physical Chemistry (3)
PHYS	302	Optics (3)
PHYS	330	Introduction to Modern Physics (3)
PHYS	331	Thermodynamics and Statistical Mechanics (3)
PHYS	405	Electricity and Magnetism (3)

MATH 345 Elements of Mathematical Statistics and Probability Theory (3)

**TOTAL CREDITS: 124**