

# BIOLOGICAL SCIENCES MAJOR (B.A.)

<https://manchester.unh.edu/program/ba/biological-sciences-major>

## Description

Biology is the study of living organisms in both laboratory and field conditions. It concerns itself with questions of understanding the living world, its complex interrelationships, and the role of human beings within it.

The B.A. in biological sciences at UNH Manchester is designed to:

1. allow students to earn a baccalaureate degree in biology at UNH Manchester;
2. allow students to combine study in biology with other programs and disciplines by completing a second major, a minor, or a self-designed set of elective courses along with their biology degree;
3. provide an opportunity for students to complete a baccalaureate degree in biology while preparing to pursue a Master's degree in biology, biotechnology, or other fields. These degree programs could be undertaken after completion of the B.A. Alternatively, UNH offers several accelerated Master's programs where excellent senior students in the Biological Sciences major can complete coursework towards their undergraduate and graduate degrees at the same time;
4. allow students to complete a major in biology while taking required courses in education in preparation for the five-year M.A.T. or M.Ed. programs and state certification in secondary science education; or alternative state certification pathway;
5. provide an opportunity for students to complete a baccalaureate degree in biology while completing the required courses for admission to medical, dental, veterinary, physician assistant, pharmacy, physical therapy, optometry, and other professional or graduate programs.

Employment opportunities in the public and private sectors include education; industrial, clinical, and research laboratories; biotechnology; and environmental field research.

## Requirements

Students must complete a minimum of 128 credits and satisfy the University's Discovery Program and foreign language requirements. Each course required in the major must be completed with a minimum grade of C-. Students must attain a minimum GPA in the major of 2.0. Transfer students must complete at least 24 credits in the major at UNH. BIOL 413 Principles of Biology I, BIOL 414 Principles of Biology II may be used to satisfy the biological sciences Discovery requirement and CHEM 403 General Chemistry I, CHEM 404 General Chemistry II may be used to satisfy the Physical Sciences Discovery requirement. PSYC 402 Statistics in Psychology may be used to satisfy the Quantitative Reasoning Discovery requirement; however, students interested in graduate or professional programs are encouraged to take MATH 425 Calculus I, or MATH 424B Calculus for Life Sciences, to satisfy the Quantitative Reasoning requirement.

The UNH Manchester B.A. in biological sciences program is structured with three levels of coursework.

## Biology Core Curriculum

Code	Title	Credits
<b>Biology Courses</b>		
BIOL 411 or BIOL 413	Introductory Biology: Molecular and Cellular Principles of Biology I	4
BIOL 412 or BIOL 414	Introductory Biology: Evolution, Biodiversity and Ecology Principles of Biology II	4
BMS 503 & BMS 504	General Microbiology and General Microbiology Laboratory	5
BIOL 541	Ecology	4
GEN 604	Principles of Genetics	4
<b>Chemistry Courses</b>		
CHEM 403 & CHEM 404	General Chemistry I and General Chemistry II	8
<b>Mathematics Courses</b>		
Select one of the following:		4
MATH 418	Analysis and Applications of Functions	
MATH 425	Calculus I	
MATH 424B	Calculus for Life Sciences	
<b>Statistics Course</b>		
PSYC 402	Statistics in Psychology <sup>1</sup>	4
<b>Total Credits</b>		<b>37</b>

<sup>1</sup> Other statistics courses such as BIOL 528 Applied Biostatistics I or BUS 430 Introduction to Business Statistics may be used to satisfy this requirement.

Depending on their specific academic and career goals, in particular, students preparing for professional or graduate programs, may, in consultation with their advisor, elect to take additional supporting science courses such as:

Code	Title	Credits
CHEM 545 & CHEM 546	Organic Chemistry and Organic Chemistry Laboratory (one semester)	5
CHEM 651 & CHEM 653	Organic Chemistry I and Organic Chemistry Laboratory (two semesters)	5
CHEM 652 & CHEM 654	Organic Chemistry II and Organic Chemistry Laboratory (two semesters)	5
BMCB 658 & BMCB 659	General Biochemistry and General Biochemistry Lab	5
MATH 426	Calculus II	4
PHYS 401	Introduction to Physics I	4
PHYS 402	Introduction to Physics II	4

These courses are often required for admission to medical, professional, and other graduate programs. Medical and dental graduate schools also require PSYC 401 Introduction to Psychology and SOC 400 Introductory Sociology.

## Self-Designed Concentration in Biology

Students will select, in consultation with their advisor, four biology courses at the 600-700 level to be taken at UNH Manchester or UNH Durham.

## Capstone Experience

Code	Title	Credits
BSCI 701	Senior Seminar I (during either semester of senior year)	1
In consultation with your academic advisor, select a capstone experience, such as the following:		4
BSCI 792	Research	
BSCI 793	Internship	
BSCI 794	Clinical Microbiology Internship	

BSCI 795	Independent Study	
<b>Total Credits</b>		<b>5</b>

BSCI 701 Senior Seminar I will meet weekly during either semester of the senior year in a seminar format. Students will share information about capstone experiences, listen to presentations on timely issues in biology, develop career preparation skills, and receive training in poster production. Other methods of oral presentation and scientific writing are explored as students prepare to present the results of their capstone activities at the Undergraduate Research Conference or other venues.

In addition, all students will take elective courses to fulfill the 128-credit requirement for a B.A. degree. These elective courses could fulfill the requirements for a major or minor in another program or they could fulfill a self-designed interdisciplinary concentration. Where appropriate, they could include some of the biology-related supporting science courses listed above. These courses would be selected in consultation with the advisor and the appropriate faculty advisor in another program.

For more information, contact Kyle MacLea, Program Coordinator, at [Kyle.MacLea@unh.edu](mailto:Kyle.MacLea@unh.edu) or contact the [Office of Admissions](mailto:unhm.admissions@unh.edu) ([unhm.admissions@unh.edu](mailto:unhm.admissions@unh.edu)), (603) 641-4150.

## Degree Plan

### Sample Course Sequence

Course	Title	Credits
<b>First Year</b>		
<b>Fall</b>		
BIOL 413	Principles of Biology I	4
CHEM 403	General Chemistry I	4
ENGL 401	First-Year Writing	4
MATH 418	Analysis and Applications of Functions	4
UMST 401	First Year Seminar	1
<b>Credits</b>		<b>17</b>
<b>Spring</b>		
BIOL 414	Principles of Biology II	4
CHEM 404	General Chemistry II	4
PSYC 402	Statistics in Psychology	4
Discovery Course		4
<b>Credits</b>		<b>16</b>
<b>Second Year</b>		
<b>Fall</b>		
BIOL 541	Ecology	4
Foreign Language I		4
Discovery Course		4
Discovery Course		4
<b>Credits</b>		<b>16</b>
<b>Spring</b>		
BMS 503 & BMS 504	General Microbiology and General Microbiology Laboratory	5
GEN 604	Principles of Genetics	4
Foreign Language II		4
Discovery Course		4
<b>Credits</b>		<b>17</b>

### Third Year

#### Fall

600/700 Biological Concentration	4
Discovery Course	4
Elective Course	4
Elective Course	4

**Credits** **16**

#### Spring

600/700 Biological Concentration	4
Discovery Course	4
Elective Course	4
Elective Course	4

**Credits** **16**

### Fourth Year

#### Fall

600/700 Biological Concentration	4
Capstone	4
Elective Course	4
Elective Course	4

**Credits** **16**

#### Spring

600/700 Biological Concentration	4	
BSCI 701	Senior Seminar I	1
Elective Course	4	
Elective Course	4	
Elective Course	1	

**Credits** **14**

**Total Credits** **128**

## Student Learning Outcomes

A student successfully completing the Biological Sciences program will be able to:

- Understand the fundamentals of basic biological principles, concepts, and theories.
- Demonstrate the ability to evaluate, apply, and synthesize biological information and ideas.
- Be competent in basic biology and chemistry laboratory skills and with the use of common laboratory equipment and instrumentation.
- Demonstrate the ability to communicate technical information related to biological sciences related topics in scientific writing and oral presentations.
- Understand, analyze, and evaluate primary research literature involving biological sciences related topics.
- Understand and apply the process of the scientific method, including being able to formulate hypotheses, design and conduct experiments with adequate controls to test hypotheses, interpret and evaluate data, and draw conclusions.
- Gather, analyze, organize, evaluate, and present scientific data, including the use of technology to solve problems and communicate information.
- Demonstrate the ability to function as a member of a team.

- Compete effectively for entry-level employment and for admission to graduate or professional schools in their chosen area and be successful in these endeavors.