BIOTECHNOLOGY MAJOR (B.S.)

https://manchester.unh.edu/academics/degree-programs/biotechnology

Description

Biotechnology is the use of living organisms, biological systems, and small chemicals and biomolecules in technology. Biotechnology has applications in the treatment of diseases, the production of food, the protection of ecosystems, and the generation of energy, as well as in the basic science study of many biological questions.

The B.S. in biotechnology at UNH Manchester is designed to:

1. allow students to earn a baccalaureate degree in biotechnology at UNH;
2. allow students to combine study in biotechnology with other programs and disciplines by completing a minor, or a self-designed set of elective courses along with their biotechnology degree;
3. allow students to complete a major in biotechnology 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;
4. provide an opportunity for students to complete a baccalaureate degree in biotechnology while completing the required courses for admission to medical, dental, veterinary, physician assistant, pharmacy, physical therapy, optometry, and other professional or graduate programs.
5. allow students to complete a baccalaureate degree in biotechnology while completing the required courses for admission to graduate research programs (M.S. or Ph.D.) in the life sciences and related fields.

Employment opportunities in the public and private sectors include education; research laboratories; clinical laboratories; forensic laboratories; jobs in diverse areas from research to quality control to sales in the pharmaceutical industry; industrial positions in the food industry; water and wastewater laboratories and facilities; and environmental research and monitoring.

Requirements

Students must complete a minimum of 128 credits and satisfy the University’s Discovery Program and writing requirement. 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 and Principles of Biology II
BMS 503 General Microbiology
& BMS 504 and General Microbiology Laboratory
GEN 604 Principles of Genetics
BSCI 501 Ethical Issues in Biology
CHEM 403 General Chemistry I
& CHEM 404 and General Chemistry II
CHEM 651 Organic Chemistry I
& CHEM 653 and Organic Chemistry Laboratory
CHEM 652 Organic Chemistry II
& CHEM 654 and Organic Chemistry Laboratory
BMCB 658 General Biochemistry
& BMCB 659 and General Biochemistry Lab
PHYS 401 Introduction to Physics I
or PHYS 407 General Physics I
PSYC 402 Statistics in Psychology
MATH 424B Calculus for Life Sciences
or MATH 425 Calculus I

Advanced Biology Courses (600/700 level)
Select five courses (at least one course from each of the three categories)

I. Advanced Biology courses
GEN 711W Genomics and Bioinformatics
GEN 714 Personal Genomics
GEN 771 Molecular Genetics
BMS 702 Endocrinology
BMS 705 Immunology
or BMS 705 Immunology
& BMS 715 and Immunology Laboratory
BSCI 620 Global Science Exploration
BSCI 670 Clinical Pathophysiology
BSCI 680 Pharmacology
BSCI 692 Evolutionary Medicine
BSCI 695 Exploring Biology Teaching (1-4 credits)
BSCI 735 Cell Biology
BSCI 750 Cancer Biology: From Benchtop Research to Therapeutic Interventions

II. Laboratory Techniques courses
BMCB 753 Cell Culture
BSCI 765 Nucleic Acid Techniques
BSCI 766 Protein and Immunologic Techniques
BSCI 777 Molecular Biology and Biotechnology
CHE 651 Biotech Experience/Blomanchuring (BTEC 220 GBCC)
ZOOL 625 Principles of Animal Physiology
& ZOOL 626 and Animal Physiology Laboratory

III. Advanced Microbiology courses
BMS 601 Bacteriology of Food
BMS 602 Pathogenic Microbiology
& BMS 603 and Pathogenic Microbiology Laboratory
BMS 706 Virology
& BMS 708 Virology Laboratory
BSCI 737 Microbial Genomics
BSCI 740 Aquatic Microbiology

Total Credits 76

1 BMS 705 Immunology, may optionally be taken with or without BMS 715 Immunology Laboratory.

Depending on their specific academic and career goals and in consultation with their adviser, students may elect to take additional supporting science courses and a full year of physics (adding PHYS 402 Introduction to Physics II to PHYS 401 Introduction to Physics I listed above). These courses are often required for admission to medical, veterinary, and other professional and graduate programs.

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<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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<tr>
<td>BSCI 701</td>
<td>Senior Seminar I (during either semester of the senior year)</td>
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<td>Select a capstone experience, such as the following:</td>
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<td>BSCI 792</td>
<td>Research</td>
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<tr>
<td>BSCI 793</td>
<td>Internship</td>
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<td>BSCI 794</td>
<td>Clinical Microbiology Internship</td>
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<tr>
<td>BSCI 795</td>
<td>Independent Study</td>
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Total Credits 5

Senior Seminar 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 provide 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.S. 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. These courses would be selected in consultation with the adviser and the appropriate faculty adviser in another program.

For more information, contact Stephen Pugh, program coordinator, at Stephen.Pugh@unh.edu; or contact the Office of Admissions (unhm.admissions@unh.edu), (603) 641-4150.