

Biology - B.S.

Effective Fall 2020, Johnson & Wales University will complete its transition from a term calendar to a semester calendar. Starting with the 2020–21 catalog, all programs will represent course requirements in semester credit hours rather than quarter credit hours. Students who started on terms and will finish their degree requirements on semesters should consult with their assigned academic counselor in Student Academic Services or faculty advisor on semester transition academic planning.

The Biology bachelor's degree program provides a strong background of critical thinking skills and knowledge needed for further study in professional and graduate schools, and for careers in biological science. The study of biology enables students to gain an understanding of the principles that govern life from the basic biochemistry of living cells to that of complex ecosystems. This understanding helps students identify and address the biological problems associated with human beings and their environments.

Upon completion of the program, graduates are expected to:

- Understand and apply the fundamental biological concepts of evolution, structure and function, information exchange and storage, and transformation of energy and matter to explain biological systems from molecules to communities.
- Communicate scientific information using oral and written arguments, and visual presentation.
- Identify, evaluate and analyze scientific information.
- Apply the scientific method and critical thinking skills to address scientific questions.
- Apply mathematical and computational skills and interdisciplinary concepts and knowledge to interpret biological phenomena.
- Recognize ethical concerns pertaining to biological science and apply ethical practice in the scientific process.
- Evaluate the influence that biological science has on society including the historical context of major findings in modern biology.

The courses in this program have been designed to provide students with a strong foundation in the fundamental principles of biology. The biology courses allow students to explore the molecular and cellular basis of life, structure and function of organisms, and ecological interactions of organisms. The physical science courses provide opportunities for students to break the barriers between traditional sciences and integrate their knowledge of biology, chemistry and physics, a practice that is essential to the future of scientific progress.

To support student success in the Biology program, science faculty members are committed to following best practices for science education. This includes using active learning pedagogies in the classroom and guided inquiry learning pedagogies in the laboratories, and providing quality internships opportunities. These teaching pedagogies are student-centered, interactive and focused on problem-based learning. They provide students with multiple opportunities to gain experiential training and use critical-thinking skills, both of which are essential for being successful members of the scientific community.

Graduates are prepared for careers that include, but are not limited to, biological technicians, forensic scientists, environmental scientists, microbiologists, medical laboratory scientists, zoologists and wildlife biologists. The Biology degree program also prepares students to pursue careers in healthcare, education and business.

Biology

A four-year program leading to the bachelor of science degree

Major Courses

| | | |
|---------|---|------|
| BIO1022 | General Biology - Organismal | 4.5 |
| BIO1025 | General Biology Laboratory - Organismal | 2.25 |
| BIO2001 | Genetics | 4.5 |
| BIO3010 | Principles of Biochemistry | 4.5 |
| BIO3040 | Molecular Biology | 4.5 |
| BIO4011 | Microbiology | 4.5 |
| BIO4015 | Microbiology Laboratory | 2.25 |

Major Electives

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|--|------|
| Choose 22.5 credits of the following (at least two courses must be at 3000 level or higher): | 22.5 |
|--|------|

| | |
|-------------------|--|
| ASCI4799 | College of Arts & Sciences Internship |
| BIO2021 & BIO2025 | Functional Human Anatomy and Functional Human Anatomy Laboratory |
| BIO2041 & BIO2045 | Human Physiology and Human Physiology Laboratory |
| BIO2100 | Coastal Ecology |
| BIO2201 & BIO2205 | General Microbiology and General Microbiology Laboratory |
| BIO3070 | Evolution |
| BIO4040 | Functional Histology |
| BIO4070 | Fundamentals of Immunology |
| SCI3020 | Sustainability Policy and Planning |
| SCI3070 | Food Sustainability |
| SCI3080 | The Business of Sustainability |
| SCI4090 | Research Seminar in Sustainability |

Related Professional Studies

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|--------------------|---|------|
| BIO4100 | Senior Seminar in Biology | 4.5 |
| CAR0010 | Career Management | 1 |
| CHM1011 | General Chemistry I | 4.5 |
| CHM1015 | General Chemistry I Laboratory | 2.25 |
| CHM1022 | General Chemistry II | 4.5 |
| CHM1025 | General Chemistry II Laboratory | 2.25 |
| CHM2011 | Organic Chemistry I | 4.5 |
| CHM2015 | Organic Chemistry I Laboratory | 2.25 |
| CHM2022 | Organic Chemistry II | 4.5 |
| CHM2025 | Organic Chemistry II Laboratory | 2.25 |
| PHY1011 or PHY2011 | General Physics I / Physics I | 4.5 |
| PHY1015 or PHY2015 | General Physics I Laboratory / Physics I Laboratory | 1.5 |
| PHY1022 or PHY2022 | General Physics II / Physics II | 4.5 |
| PHY1025 or PHY2025 | General Physics II Laboratory / Physics II Laboratory | 1.5 |

A&S Core Experience

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|---|--|
| Communications Foundation Courses | 13.5 |
| ENG1020 | English Composition |
| ENG1021 | Advanced Composition and Communication |
| ENG1030 | Communication Skills |
| Integrative Learning | 9 |
| Two ILS courses, one at the 2000 level, one at the 4000 level | |
| Arts and Humanities | 9 |
| PHIL3240 | Ethics: A Global Perspective |
| One course from ART, HIST, HUM±, LIT or REL | |
| Mathematics | 9 |
| MATH1040 | Calculus I (or higher, based on student's placement) * |
| MATH2010 | Introduction to Biostatistics |
| Science | 6.75 |
| BIO1011 & BIO1015 | General Biology - Cellular and General Biology Laboratory - Cellular |
| Social Sciences | 9 |
| PSYC1001 | Introductory Psychology |
| One course from ANTH°, ECON, LEAD, PSCI or SOC | |
| A&S Electives | 9 |
| Two courses with an EASC attribute, at least one at 3000 level or higher. | |

Free Electives

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|--|---------------|
| 22.5 credits selected from 1000-4999 numbered offerings within the university. | 22.5 |
| Total Credits | 181.75 |

* Students that do not place in MATH1040 Calculus I will need to take an extra course(s), MATH1020 Fundamentals of Algebra and/or MATH1030 Precalculus, as prerequisite(s). If needed one will count as an A&S elective and the other as a free elective.

Visit Courses by Subject Code for a listing of all campus courses.

±HUM courses are not offered in North Miami or Online.

^BIO courses are not offered in North Miami, Charlotte or Online.

¶CAD courses are only offered in Providence.

±CHM courses are not offered in North Miami or Online.

°PHY courses are not offered in Charlotte.

°°ANTH courses are not offered in North Miami or Charlotte.

In addition to classes, free elective credit can be applied to a number of options such as Directed Experiential Education (DEE), Internship, Minor

or Study Abroad. For Accelerated Master's program students, up to three graduate-level courses may apply. Students are strongly encouraged to contact an adviser before scheduling free elective credits.

NOTE: Students must pass MATH0010 Basic Mathematics or have equivalent placement scores to enroll in required math course(s).

Students who graduate with a bachelor's degree must leave Johnson & Wales University with effective writing skills to fulfill the graduation writing requirement. These writing skills will be assessed at the completion of ENG1021 Advanced Composition and Communication. Students who have met the requirement of ENG1021 Advanced Composition and Communication or ENG1027 Honors Advanced Composition and Communications: Civic Discourse outside of Johnson & Wales University must fulfill the graduation writing requirement through successful completion of ENG0001 Writing Workshop.

In collaboration with academic colleges across all JWU campuses, JWU Study Abroad programs offer a variety of international options for major, minor, Arts & Sciences, and elective credit at many price points for students during the academic year and summer. Faculty-led, exchange, affiliate, and direct-enroll programs range in duration from one week to a full semester. Financial aid is applicable and scholarships are available. Visit the study abroad website for information, program descriptions and online applications.