BIOLOGY (BA)

Department Website (http://as.nyu.edu/biology/)

NYSED: 07759 **HEGIS:** 0401.00 **CIP:** 26.0101

Program Description

The science of biology reveals the workings of life in all its varied forms. The Department of Biology is home to world-class laboratories with faculty dedicated to pushing the frontiers of knowledge and educating the next generation of scientists and biomedical professionals. Research and teaching span the range of modern biology, from microbes to multicellular animals and plants, and from molecular and cellular processes to genetics, development, behavior, and evolution.

The department is committed to providing an education that is rigorous, exciting, and inclusive. Students are exposed to modern concepts and state-of-the-art methods throughout their studies, from introductory courses to upper-level electives that explore major fields of biology in depth. Education extends beyond the classroom as well. Students are encouraged to participate in laboratory research in the department and at other New York City institutions. Students also may study away while advancing in the major, an opportunity for global engagement that science majors elsewhere typically do not have.

The Biology majors and minors provide outstanding preparation for careers in research, academia, medicine, dentistry, and related fields. Graduates of the department have a remarkable record of success in acceptance into professional schools and in establishing notable careers in the biomedical sciences.

Honors Program

Candidates for a degree with honors in Biology must have an overall GPA of at least 3.65 and a minimum 3.65 GPA in all science and mathematics courses required for the major. It is the student's responsibility to secure a faculty member to sponsor the research and to provide laboratory space and equipment. All research credits should be completed by the end of the junior year.

In addition to all courses required for the Biology major, students pursuing honors must also complete the following three courses (10 credits):

- One semester of either Independent Study (BIOL-UA 997, 998; 4 credits per term) or Internship (BIOL-UA 980, 981; 4 credits per term). Department approval of laboratory-based research is required. Application forms are available online on the Department of Biology's website. For Biology majors on the standard track or on the Ecology track, this research course may count as one of the five required upper-level elective courses. For GPH/Science majors with concentration in Biology, this research course may count as one of the two additional major electives (not as an emphasis area elective). Note that GPH/Science majors with concentration in Biology must also take Experiential Learning (UGPH-GU 60) as part of the core GPH requirements. It is recommended that honors track students enroll in section 002 (Individual Project) of UGPH-GU 60 while engaged in mentored research (but not in the same semester as BIOL-UA 980, 981, 997, or 998).
- BIOL-UA 995 Becoming a Scientist (Honors), 4 credits: must be taken in the fall semester before graduation. This course does not count toward the reasoning skill category.
- BIOL-UA 999 Undergraduate Research Thesis, 2 credits: must be taken in the final semester. Students prepare a written thesis based on the research results from their independent study or internship experience and defend the thesis at an oral examination before a faculty committee. Application forms, available online on the Department of Biology's website, must be submitted by the beginning of the final semester.

Admissions

New York University's Office of Undergraduate Admissions supports the application process for all undergraduate programs at NYU. For additional information about undergraduate admissions, including application requirements, see How to Apply (https://www.nyu.edu/admissions/undergraduate-admissions/how-to-apply.html).

Program Requirements

The standard track of the Biology major requires sixteen courses (70 credits) completed with a grade of C or better (courses graded Pass/Fail do not count).

The Ecology track of the Biology major requires 16 courses (69 credits) completed with a grade of C or better (courses graded Pass/Fail do not count).

Course	Title	Credits
General Education Requirements		
First-Year Seminar		4
EXPOS-UA 1	Writing as Inquiry	4
Foreign Language [1]		16
Texts and Ideas		4
Cultures and Contexts		4
Societies and the Social Sciences		4
Expressive Culture		4
Major Requirements		
Select one of the following tracks:		69-70
Standard Biology (see track requirements below)		
Ecology (see track requirements below)		
Electives		
Other Elective Credits		18
Total Credits		**128**

[1] The foreign language requirement is satisfied upon successful completion through the Intermediate level of a language. This may be accomplished in fewer than 16 credits, but those credits must then be completed as elective credit.

Track Requirements

Standard Biology

Course	Title	Credits
Core Courses		
BIOL-UA 11	Principles of Biology I [1]	4
BIOL-UA 12	Principles of Biology II [1]	4
BIOL-UA 21	Molecular and Cell Biology I [2]	4
BIOL-UA 22	Molecular and Cell Biology II [2]	4
Upper-Level Courses		

Select five upper-level biology courses [3]		20
Additional Courses		
Chemistry		
CHEM-UA 125	General Chemistry I & Laboratory	5
CHEM-UA 126	General Chemistry II & Laboratory	5
CHEM-UA 225	Organic Chemistry I & Laboratory	5
CHEM-UA 226	Organic Chemistry II & Laboratory	5
Physics		
PHYS-UA 11	General Physics I	5
PHYS-UA 12	General Physics II	5
Mathematics		
MATH-UA 121	Calculus I	4
Total Credits		**70**

1 Biology majors are not required to register for the 1-credit BIOL-UA 123 Principles of Biology Laboratory. It is intended for prehealth students not majoring in Biology.

2 Students may also register for the optional 1-credit BIOL-UA 223 Molecular and Cell Biology Laboratory concurrently with BIOL-UA 21 Molecular and Cell Biology I.

3 Biology majors must complete five additional 4-point upper-level biology courses. In consultation with their adviser or with the director of undergraduate studies, students select at least one course from each of the following three skill categories, plus two additional electives:

1. Laboratory skill courses: “At the Bench” or research courses
2. Quantitative skill courses: math, computational, and modeling courses
3. Reasoning skill courses: reading-intensive courses

The two additional upper-level electives may be satisfied either by taking advanced biology courses (electives covering key areas of biology) or by taking additional reasoning, quantitative, or laboratory skills courses. A current list of advanced biology courses and of courses satisfying each category above is maintained on the official website of the Department of Biology.

Ecology

Course	Title	Credits
Core Courses		
BIOL-UA 11	Principles of Biology I [1]	4
BIOL-UA 12	Principles of Biology II [1]	4
BIOL-UA 21	Molecular and Cell Biology I [2]	4
BIOL-UA 63	Fundamentals of Ecology [2]	4
Upper-Level Courses		
Select five upper-level biology courses [3]		20
Additional Courses		
Chemistry		
CHEM-UA 125	General Chemistry I & Laboratory	5
CHEM-UA 126	General Chemistry II & Laboratory	5
CHEM-UA 225	Organic Chemistry I & Laboratory	5
CHEM-UA 226	Organic Chemistry II & Laboratory	5
Physics		
PHYS-UA 11	General Physics I	5
Mathematics		
MATH-UA 121	Calculus I	4
MATH-UA 122 or MATH-UA 140	Calculus II Linear Algebra	4
Total Credits		**69**

1 Biology majors are not required to register for the 1-credit BIOL-UA 123 Principles of Biology Laboratory. It is intended for prehealth students not majoring in Biology.

2 Students may also register for the optional 1-credit BIOL-UA 223 Molecular and Cell Biology Laboratory concurrently with BIOL-UA 21 Molecular and Cell Biology I.

3 Biology majors must complete five additional 4-point upper-level biology courses. In consultation with their adviser or with the director of undergraduate studies, students select at least one course from each of the following three skill categories, plus two additional electives:

1. Laboratory skill courses: “At the Bench” or research courses
2. Quantitative skill courses: math, computational, and modeling courses
3. Reasoning skill courses: reading-intensive courses

The two additional upper-level electives may be satisfied either by taking advanced biology courses (electives covering key areas of biology) or by taking additional reasoning, quantitative, or laboratory skills courses. A current list of advanced biology courses and of courses satisfying each category above is maintained on the official website of the Department of Biology. Note that the set of courses that may be used as electives for the Ecology track is not identical to the set that may be used for the standard Biology track.

General Information

There is no chemistry (or any other) prerequisite or corequisite for the Principles of Biology sequence. However, students intending any major or minor in this department -- or in Neural Science -- are expected to take BIOL-UA 11 Principles of Biology I, BIOL-UA 12 Principles of Biology II, CHEM-UA 125 General Chemistry I & Laboratory, CHEM-UA 126 General Chemistry II & Laboratory, and calculus in the first year.

Suggested Course Plans and Study Away

For reference, suggested four-year course plans for all Biology majors, including those combined with the prehealth track and also the Global Public Health/Science major with concentration in Biology, are available on the official website of the Department of Biology. Opportunities for study away that are appropriate for Biology majors are also available on the department's website. These options should be discussed with the faculty adviser, who must also approve declared majors' programs for each term.

Graduate Courses

A number of courses in specialized fields are offered at the graduate level. Courses at the BIOL-GA 1000 level are available to undergraduates who have the necessary prerequisites. To take any of the relevant BIOL-GA 1000-level graduate courses in biology, students must obtain the approval of the course instructor and the director of undergraduate studies and have their registration material approved in the department's graduate office.

Sample Plan of Study

Standard Biology

Course	Title	Credits
1st Semester/Term		
BIOL-UA 11	Principles of Biology I	4
CHEM-UA 125	General Chemistry I & Laboratory	5
MATH-UA 121	Calculus I	4
First-Year Seminar		4
	Credits	**17**
2nd Semester/Term		
EXPOS-UA 1	Writing as Inquiry	4
BIOL-UA 12	Principles of Biology II	4
CHEM-UA 126	General Chemistry II & Laboratory	5
Texts and Ideas		4
	Credits	**17**
3rd Semester/Term		
CHEM-UA 225	Organic Chemistry I & Laboratory	5
BIOL-UA 21	Molecular and Cell Biology I [1]	4
Cultures and Contexts		4
Foreign Language		4
	Credits	**17**
4th Semester/Term		
BIOL-UA 22	Molecular and Cell Biology II	4
CHEM-UA 226	Organic Chemistry II & Laboratory	5
Foreign Language		4
Expressive Culture		4
	Credits	**17**
5th Semester/Term		
BIOL-UA XXX	Upper-Level Major Elective 1 of 5 [2]	4
PHYS-UA 11	General Physics I	5
Foreign Language		4
Societies and the Social Sciences		4
	Credits	**17**
6th Semester/Term		
BIOL-UA XXX	Upper-Level Major Elective 2 of 5 [2]	4
PHYS-UA 12	General Physics II	5
Foreign Language		4
Elective		4
	Credits	**17**
7th Semester/Term		
BIOL-UA XXX	Upper-Level Major Elective 3 of 5	4
BIOL-UA XXX	Upper-Level Major Elective 4 of 5	4
Elective		4
Elective		2
	Credits	**14**
8th Semester/Term		
BIOL-UA XXX	Upper-Level Major Elective 5 of 5	4
Elective		4
Elective		4
	Credits	**12**
	Total Credits	**128**

[1] Majors are advised to also take the optional BIOL-UA 223 Molecular and Cell Biology Laboratory course.

[2] For details on these five required courses, see the "Curriculum" tab; majors must complete one course in Laboratory Skills, one in Quantitative Skills, and one in Reasoning Skills, as well as two additional advanced courses in Biology.

Ecology

Course	Title	Credits
1st Semester/Term		
BIOL-UA 11	Principles of Biology I	4
CHEM-UA 125	General Chemistry I & Laboratory	5
MATH-UA 121	Calculus I	4
First-Year Seminar		4
	Credits	**17**
2nd Semester/Term		
EXPOS-UA 1	Writing as Inquiry	4
BIOL-UA 12	Principles of Biology II	4
CHEM-UA 126	General Chemistry II & Laboratory	5
MATH-UA 122 or MATH-UA 140	Calculus II or Linear Algebra	4
	Credits	**17**
3rd Semester/Term		
CHEM-UA 225	Organic Chemistry I & Laboratory	5
BIOL-UA 63	Fundamentals of Ecology	4
Cultures and Contexts		4
Foreign Language		4
	Credits	**17**
4th Semester/Term		
BIOL-UA 21	Molecular and Cell Biology I	4
CHEM-UA 226	Organic Chemistry II & Laboratory	5
Foreign Language		4
Texts and Ideas		4
	Credits	**17**
5th Semester/Term		
BIOL-UA XXX	Upper-Level Major Elective 1 of 5 [1]	4
PHYS-UA 11	General Physics I	5
Foreign Language		4
Societies and the Social Sciences		4
	Credits	**17**
6th Semester/Term		
BIOL-UA XXX	Upper-Level Major Elective 2 of 5 [1]	4
Expressive Culture		4
Foreign Language		4
Elective		4
	Credits	**16**
7th Semester/Term		
BIOL-UA XXX	Upper-Level Major Elective 3 of 5 [1]	4
BIOL-UA XXX	Upper-Level Major Elective 4 of 5 [1]	4
Elective		4
Elective		2
	Credits	**14**
8th Semester/Term		
BIOL-UA XXX	Upper-Level Major Elective 5 of 5 [1]	4
Elective		4
Elective		4
Elective		1
	Credits	**13**
	Total Credits	**128**

[1] For details on these five required courses, see the "Curriculum" tab; majors must complete one course in Laboratory Skills, one in Quantitative Skills, and one in Reasoning Skills, as well as two additional advanced courses in Biology. BIOL-UA 16 Ecological Field Methods is recommended but not required.

Learning Outcomes

Upon successful completion of the program, graduates will have:

1. A foundation of knowledge in current concepts of, and the mechanisms underlying, living systems.
2. Skills that enable them to reason critically and to analyze primary literature in the life sciences.
3. Experience in problem-solving, including quantitative analysis.
4. The ability to use the scientific method to design and implement controlled experiments or tests to address explicit hypotheses.
5. Proficiency in communicating scientific ideas in both oral and written formats, and also in collaborating on common scientific projects.

Policies

Program Policies

Advanced Placement

Students who achieve a score of 4 or 5 on the College Entrance Examination Board Advanced Placement Examination in Biology (or have equivalent international exam credits) are exempted from taking the Principles of Biology I, II (BIOL-UA 11, 12) sequence. However, because of medical, dental, and other professional school requirements, students on the prehealth track cannot place out of Principles of Biology.

AP (or equivalent international exam credits) in Chemistry cannot count toward any majors or minors offered by the Department of Biology, or substitute for General Chemistry I, II (CHEM-UA 125, 126) wherever this sequence is a corequisite or prerequisite for any BIOL-UA course.

Biology Major and Minors: Restrictions

Students may not declare and pursue a Biology major (https://bulletins.nyu.edu/undergraduate/arts-science/programs/biology-ba/#text) in combination with any minor offered by the Department of Biology (Environmental Biology (https://bulletins.nyu.edu/undergraduate/arts-science/programs/environmental-biology-minor/); Genetics (https://bulletins.nyu.edu/undergraduate/arts-science/programs/genetics-minor/); Genomics and Bioinformatics (https://bulletins.nyu.edu/undergraduate/arts-science/programs/genomics-bioinformatics-minor/); or Molecular and Cell Biology (https://bulletins.nyu.edu/undergraduate/arts-science/programs/molecular-cell-biology-minor/)), or vice-versa. Students are also not permitted to double-minor in this department; the policy is therefore either one major or one minor in Biology. There are no exceptions.

NYU Policies

University-wide policies can be found on the New York University Policy pages (https://bulletins.nyu.edu/nyu/policies/).

College of Arts and Science Policies

A full list of relevant academic policies can be found on the CAS Academic Policies page (https://bulletins.nyu.edu/undergraduate/arts-science/academic-policies/).