BIOLOGICAL SCIENCES MAJOR

Students must also complete the Undergraduate Registration Requirement (https://catalogs.northwestern.edu/undergraduate/requirements-policies/undergraduate-registration-requirement/) and the degree requirements of their home school.

NOTE: This Catalog describes Weinberg College BA requirements that pertain to students who matriculated at Northwestern after spring quarter 2023. Refer to the Archives (https://catalogs.northwestern.edu/archives/) if you are following BA requirements described in the 2018-2019 through 2022-2023 editions.

Course	Title
Program Courses (10.02 units)	
7 core courses (5.02 units):	
BIOL_SCI 201-0	Molecular Biology
BIOL_SCI 202-0	Cell Biology
BIOL_SCI 203-0	Genetics and Evolution
BIOL_SCI 232-0	Molecular and Cellular Processes Laboratory
BIOL_SCI 233-0	Genetics and Molecular Processes Laboratory
BIOL_SCI 234-0	Investigative Laboratory
BIOL_SCI 301-0	Principles of Biochemistry
2 300-level BIOL SCI Electives [1]	
3 courses from one of the concentration areas:	
Molecular Genetics and Genomics (p. 1)	
Cell and Developmental Biology (p. 1)	
Human Health and Disease (p. 1)	
Ecology, Evolution, and Conservation Biology (p. 2)	
Biochemistry and Biophysics (p. 2)	
Computational and Systems Biology (p. 2) [2]	
Molecular Neurobiology (p. 2)	
Interdisciplinary Biology (p. 2)	
Related Courses [3]	
CHEM 110-0 & CHEM 131-0 & CHEM 132-0	Quantitative Problem Solving in Chemistry and Fundamentals of Chemistry I and Fundamentals of Chemistry II
or CHEM 151-0 & CHEM 152-0	General Chemistry I and General Chemistry II
or CHEM 171-0 & CHEM 172-0	Advanced General Inorganic Chemistry and Advanced General Physical Chemistry
CHEM 215-1 & CHEM 215-2	Organic Chemistry I and Organic Chemistry II
or CHEM 217-1 & CHEM 217-2	Accelerated Organic Chemistry I and Accelerated Organic Chemistry II
MATH 218-3	Single-Variable Calculus with Precalculus
or MATH 220-2	Single-Variable Integral Calculus
1 statistics course - BIOL_SCI 337-0 or STAT 202-0 or other approved course [4]	
PHYSICS 130-1 & PHYSICS 130-2	College Physics and College Physics
or PHYSICS 135-1 & PHYSICS 135-2	General Physics and General Physics
or PHYSICS 140-1 & PHYSICS 140-2	Fundamentals of Physics and Fundamentals of Physics

1 BIOL_SCI 398-0 Tutorial in Biology and BIOL_SCI 399-0 Independent Research do not count as 300-level BIOL SCI Electives. Students doing the Computational and Systems Biology concentration and taking a 1.0 unit course to satisfy the coding requirement may use this in place of one of the required 300-level electives.

2 This concentration also has a programming competency requirement.

3 Number of related course units depend on chemistry and mathematics sequences taken. Laboratory components of general and organic chemistry courses and physics courses require separate registration and bear separate credit. See chemistry (https://catalogs.northwestern.edu/undergraduate/arts-sciences/chemistry/) and physics (https://catalogs.northwestern.edu/undergraduate/arts-sciences/physics-astronomy/) pages of this Catalog for more information.

4 BIOL_SCI 337-0 Biostatistics may fulfill both a concentration or elective requirement and the related course requirement in statistics.

Concentration Courses

Molecular Genetics and Genomics

Course	Title
Any three of the following courses:	
BIOL_SCI 332-0	Conservation Genetics
BIOL_SCI 341-0	Population Genetics
BIOL_SCI 353-0	Molecular Biology Laboratory
BIOL_SCI 354-0	Quantitative Analysis of Biology
BIOL_SCI 359-0	Quantitative Experimentation in Biology
BIOL_SCI 378-0	Functional Genomics
BIOL_SCI 390-0	Molecular Biology of Genome Editing and Engineering
BIOL_SCI 391-0	Developmental Biology
BIOL_SCI 392-0	Developmental Genetics Laboratory
BIOL_SCI 393-0	Human Genomics
BIOL_SCI 395-0	Molecular Genetics
BIOL_SCI 396-0	Evolution and Diversity: Mushroom Genetics and Genomics

Cell and Developmental Biology

Course	Title
Any three of the following courses:	
BIOL_SCI 310-0	Human Physiology
BIOL_SCI 315-0	Advanced Cell Biology
BIOL_SCI 319-0	Biology of Animal Viruses
BIOL_SCI 327-0	Biology of Aging
BIOL_SCI 328-0	Microbiology
BIOL_SCI 353-0	Molecular Biology Laboratory
BIOL_SCI 355-0	Immunobiology
BIOL_SCI 360-0	Principles of Cell Signaling
BIOL_SCI 377-0	The Human Microbiome
BIOL_SCI 380-0	Biology of Cancer
BIOL_SCI 381-0	Stem Cells and Regeneration
BIOL_SCI 390-0	Molecular Biology of Genome Editing and Engineering
BIOL_SCI 391-0	Developmental Biology
BIOL_SCI 392-0	Developmental Genetics Laboratory

Human Health and Disease

Course	Title
Any three of the following courses:	
BIOL_SCI 302-0	Fundamentals of Neurobiology
BIOL_SCI 310-0	Human Physiology
BIOL_SCI 319-0	Biology of Animal Viruses

BIOL_SCI 325-0	Animal Physiology
BIOL_SCI 327-0	Biology of Aging
BIOL_SCI 328-0	Microbiology
BIOL_SCI 344-0	Anatomy of Vertebrates
BIOL_SCI 353-0	Molecular Biology Laboratory
BIOL_SCI 355-0	Immunobiology
BIOL_SCI 358-0	Advanced Physiology Laboratory
BIOL_SCI 360-0	Principles of Cell Signaling
BIOL_SCI 377-0	The Human Microbiome
BIOL_SCI 380-0	Biology of Cancer
BIOL_SCI 381-0	Stem Cells and Regeneration
BIOL_SCI 391-0	Developmental Biology
BIOL_SCI 392-0	Developmental Genetics Laboratory

Ecology, Evolution, and Conservation Biology

Course	Title
Any three of the following courses:	
BIOL_SCI 332-0	Conservation Genetics
BIOL_SCI 333-0	Plant-Animal Interactions
BIOL_SCI 334-0	Soils and the Environment: The Earth's Critical Zone
BIOL_SCI 336-0	Spring Flora
BIOL_SCI 337-0	Biostatistics
BIOL_SCI 339-0	Critical Topics in Ecology and Conservation
BIOL_SCI 341-0	Population Genetics
BIOL_SCI 342-0	Evolutionary Processes
BIOL_SCI 344-0	Anatomy of Vertebrates
BIOL_SCI 346-0	Field Ecology
BIOL_SCI 347-0	Conservation Biology
BIOL_SCI 349-0	Community Ecology
BIOL_SCI 350-0	Plant Evolution and Diversity Lab

Biochemistry and Biophysics

Course	Title
Any three of the following courses:	
BIOL_SCI 323-0	Bioinformatics: Sequence and Structure Analysis
BIOL_SCI 338-0	Modeling Biological Dynamics
BIOL_SCI 353-0	Molecular Biology Laboratory
BIOL_SCI 360-0	Principles of Cell Signaling
BIOL_SCI 361-0	Protein Structure and Function
BIOL_SCI 363-0	Biophysics

Computational and Systems Biology

Course	Title
Coding requirement for this concentration may be satisfied by COMP_SCI 110-0, COMP_SCI 111-0, or NICO 101-0 plus NICO 102-0. One unit of programming coursework may substitute for one of the two required 300-level Biol Sci electives.	
Any three of the following courses:	
BIOL_SCI 323-0	Bioinformatics: Sequence and Structure Analysis
BIOL_SCI 337-0	Biostatistics
BIOL_SCI 338-0	Modeling Biological Dynamics
BIOL_SCI 354-0	Quantitative Analysis of Biology
BIOL_SCI 359-0	Quantitative Experimentation in Biology
BIOL_SCI 378-0	Functional Genomics
CHEM_ENG 379-0	Computational Biology: Analysis and Design of Living Systems
Selected sections of BIOL_SCI 345-0 and ES_APPM 495-0 are also eligible to be applied to this concentration. [5]	

[5] For example BIOL_SCI 345-0 may be applied towards the Computational and Systems Biology concentration when the topic is, "Principles & Methods in Systems Biology;" ES_APPM 495-0 may be applied when the topic is, "Introduction to the Analysis of RNA Sequencing Data."

Molecular Neurobiology

Course	Title
Any three of the following courses:	
BIOL_SCI 302-0	Fundamentals of Neurobiology
BIOL_SCI 303-0	Molecular Neurobiology
BIOL_SCI 305-0	Neurobiology Laboratory
BIOL_SCI 307-0	Brain Structure, Function, and Evolution
BIOL_SCI 325-0	Animal Physiology
BIOL_SCI 360-0	Principles of Cell Signaling
BIOL_SCI 391-0	Developmental Biology
BIOL_SCI 392-0	Developmental Genetics Laboratory

Interdisciplinary Biology

Customized concentration consisting of a thematic set of three, 300-level Biol Sci courses approved by the biology program. Interdisciplinary themes should be unique and distinct from already established concentrations.

Honors in Biological Sciences

Seniors may be recommended to the college for graduation with honors if they have completed BIOL_SCI 397-0 Senior Thesis Colloquium and at least one quarter of BIOL_SCI 398-0 Tutorial in Biology or BIOL_SCI 399-0 Independent Research, have written an approved honors thesis based on their independent study, and have sufficiently high grades.

Majors with strong academic records and an interest in pursuing honors must complete BIOL_SCI 397-0 Senior Thesis Colloquium in Winter Quarter of Senior Year.

For more information consult the biological sciences website and see the Honors in the Major (https://catalogs.northwestern.edu/undergraduate/arts-sciences/#academicoptionstext).