

PROGRAM OVERVIEW

Biology is the study of life, and integrative biology emphasizes the study and understanding of living organisms at different levels of organization, from molecular biology to biosphere ecology. We teach biology students core information that serves as a foundation for advanced study and professional training. This basic knowledge includes concepts central to our understanding of molecular biology, as well as the relationship between structure and function, and the genetic mechanisms of inheritance. In addition, biology students are educated in cell biology and genetics, as well as the technological breakthroughs that have led to discoveries in these fields. They learn how organisms adapt to diverse environments and about energy flow and nutrient cycles through ecosystems, worldwide biodiversity and how ecological function can be altered by human impacts.

The Microbiology Track studies organisms that, for the most part, are not easily visible with the naked eye, including algae, archaea, bacteria, fungi, protozoa, and viruses. Microbes are notorious for causing disease, but microbes also play critical roles in maintaining human health and supporting life on Earth. In the Microbiology track, you will explore microbes in the context of medicine, molecular biology, cell biology, genetics, immunology, biotechnology, ecology, and evolution. The Microbiology track prepares students for careers in many fields including medicine, agriculture, public health, government, environmental science, basic research, education, industrial microbiology, food microbiology, and pharmaceuticals.

ACADEMIC ADVISING

The College of Liberal Arts and Sciences (CLAS) supports students to graduation using a shared advising system. CLAS students have two academic advisors with whom they should meet regularly to discuss academic and degree progress: a CLAS Academic Advisor and a major advisor.

For questions related to CU Denver Core Curriculum, CLAS, general graduation requirements, university/college academic policies, or campus resources contact:

CLAS Academic Advising

clas.advising@ucdenver.edu

Visit the CLAS Advising website [here](#)

North Classroom (NC) 1030

303-315-7100

For questions related to major requirements, major course prerequisites, or evaluation of transfer coursework in your major contact:

Biology Major Advising

[CLAS Major Advisor Contact Information](#)

Visit the program website [here](#)

Science Building (SI) 2071

303-315-7600

GENERAL GRADUATION REQUIREMENTS & POLICIES

All CU Denver CLAS students are required to complete the following minimum general graduation requirements to be eligible to apply for graduation:

1. Complete a minimum of 120 credit hours
2. Achieve a minimum 2.0 CU cumulative grade point average (GPA)
3. Complete a minimum of 30 upper-division (3000- to 4000-level) credit hours
4. Complete all CU Denver Core, CLAS, and major requirements
5. Complete a minimum of 30 CLAS credit hours with letter grades at CU Denver

*The following are **maximum** credit hours that can apply toward the minimum 120 credit hours required for graduation:*

- 16 credit hours Pass/Fail
- 12 credit hours of Independent Study/Directed Research
- 12 credit hours of internship credit
- 8 credit hours of physical education credit

PROGRAM REQUIREMENTS & POLICIES

Students are responsible for meeting with the major advisor to confirm major requirements. In addition to completing all CU Denver Core and CLAS requirements, students completing the Biology Microbiology B.S. Degree are required to complete the following minimum program requirements:

1. Students must complete a minimum of 36 BIOL credit hours.
2. Students must complete a minimum of 15 credit hours in ancillary coursework.
3. Students must complete a minimum of 18 upper division (3000- level and above) BIOL credit hours.
4. Students must earn a minimum grade of C- (1.7) in all courses that apply to the major and must achieve a minimum cumulative major GPA of 2.0. Courses taken using P+/P/F or S/U grading cannot apply to major requirements. Grades in courses that fulfill requirements for the major (including electives, required classes, and ancillary classes) are calculated in the major GPA.
5. Students must complete a minimum of 18 upper division (3000-level and above) BIOL credit hours with CU Denver faculty and at least 3 credits must be at 4000-level or higher.
6. Courses more than ten years old will not count automatically, but can be evaluated individually for their current relevance to the degree program through a petition process with the Department of Integrative Biology Curriculum Committee. Approval for courses older than ten years is not guaranteed so students may be required to update their knowledge by taking additional courses when past courses are outdated.
7. Undergraduate students may count up to six credit hours of independent study or internship (any combination of BIOL 3840 Independent Study, BIOL 3939 Internship, BIOL 4840 Independent Study, BIOL 4880 Directed Research) toward the upper-division Biology electives requirement in the major.

LYNXCONNECT RESOURCES

Are you interested in learning about internship, study abroad, career, and research opportunities for this major? Visit the CU Denver LynxConnect, located in Tivoli Student Union (TV) Suite 339, and browse the LynxConnect [website](#) for more information.

Degree Requirements	Credits	Notes
* Course prerequisites change regularly. Students are responsible for consulting advisors and the class schedule in the student portal for prerequisite information. *		
CU Denver Core Curriculum Requirements	34 - 40	CU Denver Core Curriculum Requirements
CLAS Graduation Requirements		CLAS Graduation Requirements
BIOL Major Requirements	51	
BIOL Required Courses		
BIOL 2010 & 2011 Organisms to Ecosystems (Gen Bio) with lab or BIOL 2030 & 2031 Honors Organisms to Ecosystems (Gen Bio) with lab	4	Courses can fulfill CU Denver Core Natural/Physical Science with lab *Prerequisite: High School chemistry or CHEM 1000 recommended
BIOL 2020 & 2021 Molecules to Cells (Gen Bio) with lab or BIOL 2040 & 2041 Honors Molecules with Cells (Gen Bio) with lab	4	Courses can fulfill CU Denver Core Natural/Physical Science with lab *Prerequisite: C- or higher in BIOL 2010 & 2011 or 2030 & 2031
BIOL 3650 General Microbiology	3	*Prerequisite: C- or higher in BIOL 2010 or 2030, 2011 or 2031, 2020 or 2040, 2021 or 2041 and CHEM 2031 or 2032 or 2081
BIOL 3651 General Microbiology Lab	2	*Prerequisite: C- or higher in BIOL 2010 or 2030, 2011 or 2031, 2020 or 2040, 2021 or 2041 and CHEM 2031 or 2032 or 2081, and CHEM 2038 or 2039 or 2088
BIOL 3832 General Genetics or BIOL 3124 Introduction to Molecular Biology	3	*Prerequisite: C- or higher in BIOL 2010 or 2030, 2011 or 2031, 2020 or 2040, and 2021 or 2041
Upper Division Microbiology Courses Complete nine credits from the following list, including one three-credit hour 4000-level BIOL course from CU Denver Biology faculty: BIOL 3525 Parasitology or BIOL 3621 Introduction to Immunology or BIOL 4055 Virology or BIOL 4144 Medical Microbiology or BIOL 4410 Microbial Genomics or BIOL 4415 Applied Microbial Ecology	9	*Check individual courses for prerequisites
Upper Division Biology Electives Complete an additional 11 credit hours of upper-division biology electives	11	*Check individual courses for prerequisites *A max of six hours of Independent Study (BIOL3840/4840) or Directed Research (BIOL4880) or Internship (BIOL3939) be may counted toward upper-division biology elective. Internship or Directed Research is highly recommended.
Ancillary Coursework:		
CHEM 2031 & 2038 General Chemistry I with lab or CHEM 2032 & 2039 Majors General Chemistry I with lab	4 - 5	*Prerequisite: MATH1110 and High School chemistry or CHEM 1000 recommended
CHEM 2061 & 2068 General Chemistry II with lab or CHEM 2062 & 2069 Majors General Chemistry II with lab	5	*Prerequisite: C- or higher in CHEM 2031 or 2032 and 2038 or 2039
Complete one of the following quantitative courses: BIOL 3762, MATH 1401, or MATH 4830	3 - 4	*Check individual courses for prerequisites
Complete one of the following writing intensive courses: COMM 4550, ENGL 3154, ENGL 4175, ENGL 4180, or ENGL 4280	3	*Check individual courses for prerequisites
Estimated General Electives	29 - 35	General Elective credit hours will vary. Students are highly encouraged to explore and complete additional programs including certificates, minors, double-majors, and dual-degrees. Consult with CLAS Academic Advisor.
Total Minimum Credit Hours:	120	30 credit hours must be upper-division

SAMPLE ACADEMIC PLAN OF STUDY

The following academic plan is a *sample* pathway to completing degree requirements for this major. Students should tailor this plan based on previously completed college coursework (e.g., AP, IB, CLEP, dual/concurrent enrollment, and transfer credit), course availability, and individual preferences related to course load, schedules, or add-on programs such as certificates, minors, double-majors, or dual-degrees.

Year 1 - Fall	CRS
ENGL 1020 – Core Composition I	3
MATH 2830 ^C or MATH 1110 ^{PE} or 1120 ^{PE} or MATH 1130 ^{PE}	3-4
BIOL 2010 & 2011 ^{PR C} or 2030 & 2031 ^{PR}	4
CU Denver Core Social Science	3
UNIV 1110 College Success	1
Total Credit Hours	15-16

Year 1 - Spring	CRS
ENGL 2030 – Core Composition II	3
BIOL 2020 & 2021 ^{PE C} or 2040 & 2041 ^{PE}	4
MATH 1401 ^{PE} or MATH 4830 ^{PE} or BIOL 3762 ^{PE}	3-4
General Elective (Quantitative Course/MATH prerequisite if needed)	3
Total Credit Hours	15

Year 2 - Fall	CRS
BIOL 3832 ^{PE} or BIOL 3124 ^{PE}	3
BIOL Upper-Division Course ^{PE}	3
CHEM 2031 & 2038 ^{PR C} or 2032 & 2039 ^{PR C}	4
CU Denver Core Arts	3
General Elective	3
Total Credit Hours	15-16

Year 2 - Spring	CRS
BIOL 3650 ^{PE}	3
BIOL 3651 ^{PE}	2
CHEM 2061 & 2068 ^{PE C} or 2062 & 2069 ^{PE C}	5
CU Denver Core Humanities	3
General Elective	3
Total Credit Hours	14

Year 3 - Fall	CRS
BIOL 4144 ^{PE} or BIOL 4415 ^{PE} or BIOL 4055 ^{PE} (<i>only offered fall</i>)	3
BIOL Upper-Division Course ^{PE PR}	3
ENGL 4175 ^{PE} , ENGL 3154 ^{PE} , ENGL 4280 ^{PE} , ENGL 4180 ^{PE} or COMM 4550 ^{PE}	3
General Elective	3
General Elective	3
Total Credit Hours	15

Year 3 - Spring	CRS
BIOL 3525 ^{PE} or BIOL 3621 ^{PE} or BIOL 4410 ^{PE} (<i>only offered spring</i>)	3
CU Denver Core Behavioral Science	3
General Elective	3
General Elective	3
General Elective	3
Total Credit Hours	15

Year 4 - Fall	CRS
BIOL 4144 ^{PE} or BIOL 4415 ^{PE} or BIOL 4055 ^{PE} (<i>only offered fall</i>)	3
BIOL Upper-Division Course ^{PE} (Consider Internship/Directed Research)	3
CU Denver Core Cultural Diversity	3
General Elective	3
General Elective	4
Total Credit Hours	16

Year 4 - Spring	CRS
BIOL 3525 ^{PE} or BIOL 3621 ^{PE} or BIOL 4410 ^{PE} (<i>only offered spring</i>)	3
CU Denver Core International Perspectives	3
General Elective	3
General Elective	3
General Elective	3
Total Credit Hours	15