College of Liberal Arts and Sciences
UNIVERSITY OF COLORADO **DENVER**

BIOLOGY

Bachelor of Science (B.S.) – Catalog Year Fall 2018

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 cell and molecular to the biosphere. 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.

Through the study of biology, students are introduced to the cornerstones of the discipline within an evolutionary context, thereby leading to an appreciation for the diversity of life on earth and the processes supporting it. Our majors are instilled with a respect, concern, and sense of responsibility for life and the environment, as well as the knowledge to understand and evaluate biological advances that are transforming society. Our curriculum is designed to offer, through core and ancillary courses, a firm foundation in those areas that provide an important background for understanding life processes. Choosing from among a variety of biology electives accommodates individual interests.

ACADEMIC ADVISING

The College of Liberal Arts and Sciences (CLAS) supports students to graduation using a dual-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/faculty 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
Find your CLAS Advisor here
North Classroom (NC) Building 1030
303-315-7100

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

Kim Regier or **Cheri Jones**
kimberly.regier@ucdenver.edu or cheri.jones@ucdenver.edu
Visit the department website here
Science Building Room 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 semester hours passed
2. Achieve a minimum 2.0 CU cumulative grade point average (GPA)
3. Complete a minimum of 45 upper-division (3000- to 4000-level) semester hours
4. Complete all CU Denver Core, college, and major requirements
5. Residency: complete a minimum of 30 CLAS hours at CU Denver

Credits exceeding the following maximum hour restrictions will not be applied toward the minimum 120 hours required for graduation:

- 56 semester hours in major department/prefix courses
- 16 semester hours Pass/Fail
- 12 semester hours of Independent Study/Directed Research
- 9 semester hours of internship credit
- 8 semester hours of physical education credit

CAREER RESOURCES

Are you interested in learning about career and occupational options for this major? Visit the CU Denver Career Center located in the Tivoli Student Union (TV) Suite 267 to speak with a career counselor. The Career Center also provides *Career Briefs*, overviews of careers related to specific CU Denver majors, which include related links and resources to the particular field and show potential jobs related to the major. Access Career Briefs here.

PROGRAM REQUIREMENTS & POLICIES

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

1. To ensure a proper background for the study of biology, majors are required to pass 31-33 hours of coursework in ancillary disciplines.
2. A minimum of 36 hours of biology must be completed, of which 18 hours must be at the upper-division level and taken in residence with CU Denver downtown campus Biology faculty.
3. All biology courses applied to the undergraduate biology major must be completed within 10 years of graduation.
4. A minimum GPA of 2.0 is required for all BIOL courses applying to Biology requirements.
5. Biology and ancillary courses must be completed with a letter grade of C- (1.7) or higher.

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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	15 - 29	*CLAS Graduation Requirements*
BIOL Major Requirements	67 - 69	
BIOL Required Courses		
BIOL 2051 & 2071 General Biology I with lab **or** BIOL 2095 &2096 Honors General Biology I with lab	4	**Prerequisite: High School chemistry or CHEM 1000 recommend*
BIOL 2061 & 2081 General Biology II with lab **or** BIOL 2097 & 2098 Honors General Biology II with lab	4	**Prerequisite: C- or higher in General or Honors BIOL I with lab*
BIOL 3411 Principles of Ecology	3	**Prerequisite: C- or higher in General or Honors BIOL I & II with labs*
BIOL 3445 Introduction to Evolution	3	**Prerequisite: C- or higher in General or Honors BIOL I & II with labs*
BIOL 3611 General Cell Biology	3	**Prerequisite: C- or higher in General or Honors BIOL I & II with labs and General or Honors CHEM I & II with labs*
BIOL 3832 General Genetics	4	**Prerequisite: C- or higher in General or Honors BIOL I & II with labs*
BIOL Major Electives Complete an additional 15 semester hours of upper-division biology including: One upper-division biology lab course **and** One 3 credit-hour 4000-level lecture course taken in residence from CU Denver Biology faculty	15	**Check individual courses for prerequisites.* **CHEM3810 or 4820 may be counted as BIOL elective hours* **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* **BIOL 4125, 4840, 4880, and 4990 will not count as the 4000-Level elective*
Ancillary Courses:		
CHEM 2031 & 2038 General Chemistry I with lab **or** CHEM 2081 & 2088 Honors 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 2091 & 2098 Honors General Chemistry II with lab	5	**Prerequisite: C- or higher in General or Honors CHEM I with lab*
CHEM 3411 Organic Chemistry I **or** CHEM 3481 Honors Organic Chemistry I	4	**Prerequisite: C- or higher in General or Honors CHEM I & II with labs*
PHYS 2010 & 2030 College Physics I with lab **or** PHYS 2311 & 2321 General Physics I with lab	5	**Check individual courses for recommended prerequisites*
PHYS 2020 & 2040 College Physics II with lab **or** PHYS 2331 & 2341 General Physics II with lab	5	**Check individual courses for recommended prerequisites*
Complete one of the following options: 1) MATH 1401 Calculus I **or** 2) BIOL 3763 Biostatistics **and** MATH 1110 College Algebra, MATH 1120 College Trigonometry, or MATH 1130 Precalculus **or** 3) MATH 4830 Applied Statistics **and** MATH 1110 College Algebra, MATH 1120 College Trigonometry, or MATH 1130 Precalculus	4 - 8	**Check individual courses for prerequisites.*
Estimated General Electives	0 - 4	*General Elective credits vary based on Core & CLAS Requirements. Consult with CLAS Advisor.*
Total Minimum Program Hours:	120	*45 semester hours must be upper-division*

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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 minors or double-majors.

Year One	Fall	CRS
	ENGL1020 – Core Composition I	3
	MATH 1130 [C]	4
	BIOL 2051 & 2071 [PR C] or 2095 & 2096 [PR]	4
	CHEM 2031 & 2038 [PR C] or 2081 & 2088	4
	UNIV 1110 College Success	1
	Total Credit Hours	**16**

Spring	CRS
ENGL2030 – Core Composition II	3
MATH 1401 [PE], 4830 [PE] or BIOL 3763 [PE]	3-4
BIOL 2061 & 2081 [PE C] or 2097 & 2098 [PE]	4
CHEM 2061 & 2068 [PE C] or 2091 & 2098 [PE]	5
Total Credit Hours	**15-16**

Year Two	Fall	CRS
	CLAS Communicative Skills – ENGL 4175 *recommended*	3
	BIOL 3611 [PE]	3
	CHEM 3411 [PE] or 3481 [PE]	4
	CLAS Foreign Language Semester I	5
	Total Credit Hours	**15**

Spring	CRS
BIOL 3411 [PE]	3
BIOL 3445 [PE]	3
BIOL 3832 [PE]	4
CLAS Foreign Language Semester II	5
Total Credit Hours	**15**

Year Three	Fall	CRS
	PHYS 2010 & 2030 [C] or 2311 & 2321 [PR C]	5
	BIOL Upper-Division Course with lab [PE PR]	4
	CU Denver Core Behavioral Science	3
	CLAS Social Science, Upper-Division	3
	Total Credit Hours	**15**

Spring	CRS
PHYS 2020 & 2040 [C] or 2331 & 2341 [PE]	5
BIOL Upper-Division Course [PE] (Consider Internship/Directed Research)	3
CLAS Humanities – PHIL 2441 *recommended*	3
CU Denver Core Social Science	3
Total Credit Hours	**14**

Year Four	Fall	CRS
	BIOL Upper-Division Course [PE]	3
	BIOL Upper-Division Course [PE]	2
	CU Denver Core Humanities	3
	CLAS Behavioral Science	3
	Upper-Division General Electives	5
	Total Credit Hours	**16**

Spring	CRS
BIOL 4000-Level Course [PE]	3
CU Denver Core International Perspectives	3
CU Denver Core Cultural Diversity	3
CU Denver Core Arts	3
Upper-Division General Elective	3
Total Credit Hours	**15**

[M] *Major Course Available* [C] *CU Denver Core Course* [PE] *Prerequisite Enforced* [PR] *Prerequisite Recommended*

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ALTERNATIVE 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 minors or double-majors.

Students who choose this plan must realize they may take longer to graduate and may not be able to apply to professional health career programs until after their fourth, instead of their third, year.

Year One

Fall	CRS
ENGL1020 – Core Composition I	3
MATH 1110 [C]	4
CU Denver Core Humanities / First-Year Seminar	3
CHEM 1000	3
CU Denver Core Social Science	3
Total Credit Hours	**16**

Spring	CRS
ENGL2030 – Core Composition II	3
MATH 1120 [C]	3
BIOL 2051 & 2071 [PR C] or 2095 & 2096 [PE]	4
CHEM 2031 & 2038 [PR C] or 2081 & 2088 [PE]	4
Total Credit Hours	**14**

Year Two

Fall	CRS
BIOL 2061 & 2081 [PE C] or 2097 & 2098 [PE]	4
CHEM 2061 & 2068 [PE C] or 2091 & 2098 [PE]	5
MATH 1401 [PE], 4830 [PE] or BIOL 3763 [PE]	3-4
CLAS Communicative Skills – ENGL 4175 *recommended*	3
Total Credit Hours	**15-16**

Spring	CRS
BIOL 3611 [PE]	3
CHEM 3411 [PE] or 3481 [PE]	4
CLAS Humanities – PHIL 2441 *recommended*	3
CLAS Social Science, Upper-Division	3
Upper-Division General Elective	3
Total Credit Hours	**16**

Year Three

Fall	CRS
BIOL 3411 [PE]	3
BIOL 3445 [PE]	3
PHYS 2010 & 2030 [C] or 2311 & 2321 [PR C]	5
CLAS Foreign Language Semester I	5
Total Credit Hours	**16**

Spring	CRS
BIOL 3832 [PE]	4
PHYS 2020 & 2040 [C] or 2331 & 2341 [PE]	5
CLAS Foreign Language Semester II	5
Total Credit Hours	**14**

Year Four

Fall	CRS
BIOL Upper-Division Course with lab [PE PR]	4
BIOL Upper-Division Course [PE] (Consider Internship/Directed Research)	3
BIOL Upper-Division Course [PE]	2
CLAS Behavioral Science, Upper-Division	3
CU Denver Core Cultural Diversity	3
Total Credit Hours	**15**

Spring	CRS
BIOL 4000-Level Course [PE]	3
BIOL Upper-Division Course [PE]	3
CU Denver Core Arts	3
CU Denver Core International Perspectives, Upper-Division	3
CU Denver Core Behavioral Science	3
Total Credit Hours	**15**

[M] *Major Course Available* [C] *CU Denver Core Course* [PE] *Prerequisite Enforced* [PR] *Prerequisite Recommended*