

**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 Biotechnology Track will allow students to master skills used within areas such as biotechnology, medicine, agriculture, and response to climate change. Students in this track will practice employable laboratory and research skills. Example employers for this track include biotechnology companies, Centers for Disease Control and Prevention, hospital laboratories, pharmaceutical research labs, and food science labs.

**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](mailto: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 department 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 45 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 Biotechnology B.S. Degree are required to complete the following minimum program requirements:

1. Students must complete a minimum of 54 credit hours, including a minimum of 36 BIOL credit hours and a minimum of 18 credit hours in ancillary coursework.
2. Students must complete a minimum of 18 upper division (3000- level and above) BIOL credit hours.
3. 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.
4. Students must complete a minimum of 18 upper division (3000-level and above) BIOL credit hours with CU Denver faculty and at least 6 credits must be at 4000-level or higher.
5. Upper division BIOL courses more than ten years old will not count automatically to the Major, 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.
6. 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
<b>* Course prerequisites change regularly. Students are responsible for consulting advisors and the class schedule in the student portal for prerequisite information. *</b>		
<b>CU Denver Core Curriculum Requirements</b>	<b>34 - 40</b>	<a href="#">CU Denver Core Curriculum Requirements</a>
<b>CLAS Graduation Requirements</b>	<b>15 - 29</b>	<a href="#">CLAS Graduation Requirements</a>
<b>BIOL Major Requirements</b>	<b>54</b>	
<b>BIOL Required Courses</b>		
BIOL 2010 & 2011 Organisms to Ecosystems (Gen Bio) with lab <b>or</b> BIOL 2030 & 2031 Honors Organisms to Ecosystems (Gen Bio) with lab	4	Courses can fulfill CU Denver Core Natural/Physical Science with lab <b>*Prerequisite:</b> High School chemistry or CHEM 1000 recommended
BIOL 2020 & 2021 Molecules to Cells (Gen Bio) with lab <b>or</b> BIOL 2040 & 2041 Honors Molecules with Cells (Gen Bio) with lab	4	Courses can fulfill CU Denver Core Natural/Physical Science with lab <b>*Prerequisite:</b> C- or higher in BIOL 2010 & 2011 or 2030 & 2031
BIOL 3124 Introduction to Molecular Biology	3	<b>*Prerequisite:</b> C- or higher in BIOL 2010 or 2030, 2011 or 2031, 2020 or 2040, and 2021 or 2041
BIOL 3611 General Cell Biology	3	<b>*Prerequisite:</b> C- or higher in BIOL 2010 or 2030, 2011 or 2031, 2020 or 2040, 2021 or 2041, CHEM 2031 or 2081, 2038 or 2088, 2061 or 2091, and 2068 or 2098
BIOL 3024 Introduction to Biotechnology	3	<b>*Prerequisite:</b> C- or higher in BIOL 3124 or 3832
BIOL 4125 Molecular Biology Laboratory	3	<b>*Prerequisite:</b> C- or higher in BIOL 3124 or 3832
BIOL 3651 General Microbiology Lab <b>or</b> CHEM 4282 Biochemistry Lab	2 - 3	<b>*Check individual courses for prerequisites</b>
<b>Upper Division Biology Electives</b> Complete an additional 14 credit hours of upper-division biology including: Two three-credit hour 4000-level BIOL courses from CU Denver Biology faculty <b>and</b> Two upper division (3000-level and above) BIOL courses to complete the minimum 36 BIOL credits required	14	<b>*Check individual courses for prerequisites</b> <b>*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.</b> <b>Internship or Directed Research is highly recommended.</b> <b>*BIOL 4125, 4840, 4880, and 4990 will not count as the 4000-Level elective but can apply as biology electives.</b>
<b>Ancillary Coursework:</b>		
CHEM 2031 & 2038 General Chemistry I with lab <b>or</b> CHEM 2032 & 2039 Majors General Chemistry I with lab <b>or</b>	4 - 5	<b>*Prerequisite:</b> MATH1110 and High School chemistry or CHEM 1000 recommended
CHEM 2061 & 2068 General Chemistry II with lab <b>or</b> CHEM 2062 & 2069 Majors General Chemistry II with lab <b>or</b>	5	<b>*Prerequisite:</b> C- or higher in CHEM 2031 or 2032 and 2038 or 2039
CHEM 3810 Biochemistry <b>or</b> CHEM 4820 General Biochemistry II	3 - 4	<b>*Check individual courses for prerequisites</b>
Complete one of the following quantitative courses: MATH 1401, IWKS 2300, BIOL 3762 <b>or</b> MATH 4830	3 - 4	<b>*Check individual courses for prerequisites</b>
Complete one of the following writing intensive courses: ENGL 4175, ENGL 3154, ENGL 4280, ENGL 4180 <b>or</b> COMM 4550	3	Course can fulfill the CLAS Graduation Requirement for Behavioral Science, Communicative Skills or Humanities based on chosen course <b>*Check individual courses for prerequisites</b>
<b>Estimated General Electives</b>	<b>0 - 17</b>	General Elective credit hours vary based on Core & CLAS Requirements. Consult with CLAS Advisor.
<b>Total Minimum Credit Hours:</b>	<b>120</b>	45 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 One	<b>Fall</b>	CRS
	ENGL 1020 – Core Composition I	3
	MATH 2830 <sup>C</sup> or MATH 1110 <sup>PE</sup> or 1120 <sup>PE</sup> or MATH 1130 <sup>PE</sup>	3-4
	BIOL 2010 & 2011 <sup>PR C</sup> or 2030 & 2031 <sup>PR</sup>	4
	CHEM 2031 & 2038 <sup>PR C</sup> or 2032 & 2039 <sup>PR C</sup>	4
	UNIV 1110 College Success	1
	<b>Total Credit Hours</b>	<b>15-16</b>

<b>Spring</b>	CRS
ENGL 2030 – Core Composition II	3
BIOL 2020 & 2021 <sup>PE C</sup> or 2040 & 2041 <sup>PE</sup>	4
CHEM 2061 & 2068 <sup>PE C</sup> or 2062 & 2069 <sup>PE C</sup>	5
General Elective (Quantitative Course/MATH prerequisite if needed)	3
<b>Total Credit Hours</b>	<b>15</b>

Year Two	<b>Fall</b>	CRS
	BIOL 3124 <sup>PE</sup>	3
	BIOL 3611 <sup>PE</sup>	3
	MATH 1401 <sup>PE</sup> or IWKS 2300 or MATH 4830 <sup>PE</sup> or BIOL 3762 <sup>PE</sup>	3-4
	CU Denver Core Arts	3
	CU Denver Core Behavioral Science	3
	<b>Total Credit Hours</b>	<b>15-16</b>

<b>Spring</b>	CRS
BIOL Upper-Division Course <sup>PE</sup>	3
BIOL Upper-Division Lab Course <sup>PE PR</sup>	2-3
CHEM 3401 <sup>PE</sup> or 3411 <sup>PE</sup>	3-4
CU Denver Core Humanities	3
CLAS Behavioral Science <sup>M</sup>	3
<b>Total Credit Hours</b>	<b>14-15</b>

Year Three	<b>Fall</b>	CRS
	BIOL 4125 <sup>PE</sup>	3
	CHEM 3810 <sup>PE</sup> or 4820 <sup>PE</sup>	3-4
	CU Denver Core Social Science	3
	CLAS Second Language Semester I	5
	General Elective	3
	<b>Total Credit Hours</b>	<b>17-18</b>

<b>Spring</b>	CRS
BIOL 3024 <sup>PE</sup>	3
ENGL 4175 <sup>PE</sup> , ENGL 3154 <sup>PE</sup> , ENGL 4280 <sup>PE</sup> , ENGL 4180 <sup>PE</sup> or COMM 4550 <sup>PE</sup>	3
CLAS Communicative Skills <sup>M</sup>	3
CLAS Second Language Semester II	5
CLAS Social Science	3
<b>Total Credit Hours</b>	<b>17</b>

Year Four	<b>Fall</b>	CRS
	BIOL 4000-Level Course <sup>PE</sup>	3
	BIOL Upper-Division Course <sup>PE</sup> (Consider Internship/Directed Research)	3
	CLAS Humanities <sup>M</sup>	3
	Upper-Division General Elective	3
	Upper-Division General Elective	3
	<b>Total Credit Hours</b>	<b>15</b>

<b>Spring</b>	CRS
BIOL 4000-Level Course <sup>PE</sup>	3
BIOL Upper-Division Course <sup>PE</sup>	3
CU Denver Core International Perspectives	3
CU Denver Core Cultural Diversity	3
Upper-Division General Elective	3
<b>Total Credit Hours</b>	<b>15</b>

<sup>M</sup> Major Course Available    <sup>C</sup> CU Denver Core Course    <sup>PE</sup> Prerequisite Enforced    <sup>PR</sup> Prerequisite Recommended