

# BIOTECHNOLOGY CERTIFICATE

## Introduction

Please click here (<http://catalog.ucdenver.edu/cu-denver/undergraduate/schools-colleges-departments/college-liberal-arts-sciences/integrative-biology/>) to see Integrative Biology department information.

Biotechnology is a rapidly growing field in Colorado and nationally that encompasses many disciplines. Agriculture, biofuels, biomedical biotechnology, pharmaceuticals, microbiology, and medical device development are all well-represented areas of biotechnology in Colorado. The Department of Integrative Biology offers a Certificate program in Biotechnology that allows students to acquire foundational knowledge and specialized skills relevant to these research areas. The certificate is designed to provide a strong background in biochemistry and molecular biology, with an emphasis on applied training via lab work and research experiences. Upon completion of the requirements, students obtain recognition in the form of a Certificate and official designation on their transcript.

These degree requirements are subject to periodic revision by the academic department, and the College of Liberal Arts and Sciences reserves the right to make exceptions and substitutions as judged necessary in individual cases. Therefore, the College strongly urges students to consult regularly with their major advisor and CLAS advisor to confirm the best plans of study before finalizing them.

## Program Delivery

- This is an on-campus program.

## Declaring This Certificate

Students may earn the certificate while working on their Bachelors Degree# or, the courses may be taken through non#degree admission. All admissions questions should be directed to the Registrar's office. All questions regarding tuition and fees should be directed to the Bursar's office.

Students interested in completing the Biotechnology certificate should contact the Department of Integrative Biology. ([https://clas.ucdenver.edu/integrative-biology/academics/certificates/#biotechnology\\_certificate-93](https://clas.ucdenver.edu/integrative-biology/academics/certificates/#biotechnology_certificate-93)) A certificate will be issued and noted on your transcript upon proof of satisfactory completion of the course work. You must contact the Biotechnology Certificate faculty advisor no later than the start of the semester of graduation in order for the certificate recognition to appear on your transcripts.

## General Requirements

Students must satisfy all requirements as outlined below and by the department offering the certificate.

- Click here (<http://catalog.ucdenver.edu/cu-denver/undergraduate/academic-policies-procedures/>) for information about Academic Policies.

## Program Requirements

1. Students must complete a minimum of 17 credits from approved courses.

2. Students must complete a minimum of 17 upper division (3000-level and above) credit hours from approved courses.
3. Students must earn a minimum grade of C (2.0) in all certificate courses taken at CU Denver and must achieve a minimum cumulative certificate GPA of 2.0. All graded attempts in required and elective courses are calculated in the certificate GPA. Students cannot complete certificate or ancillary course requirements as pass/fail.
4. All courses used to satisfy the requirements for the Certificate must be completed at CU Denver.

## Program Restrictions, Allowances and Recommendations

1. Individual courses used to earn the Biotechnology Certificate carry prerequisites that must be met before enrolling.
2. All courses used to satisfy the requirements for the Certificate must be completed within a five-year period.
3. You must contact the Biotechnology Certificate faculty advisor (Dr. Chris Miller) no later than the start of the semester of graduation in order for the certificate recognition to appear on your transcripts.

## Required Courses

Code	Title	Hours
<i>Take all of the following</i>		<i>15-16</i>
BIOL 3124	Introduction to Molecular Biology	3
BIOL 4024	Introduction to Biotechnology	3
BIOL 4125	Molecular Biology Laboratory	3
BIOL 3939	Internship	3
or BIOL 4880	Directed Research	
CHEM 3810	Biochemistry	3-4
or CHEM 4820	General Biochemistry II	

## Elective Courses

Code	Title	Hours
<i>Take one elective from among those listed below, or a course pre-approved by the Biotechnology Certificate faculty advisor</i>		<i>2-4</i>
BIOL 3612	Cell Biology Laboratory	3
BIOL 3763	Biostatistics	4
BIOL 4055	Virology	3
BIOL 4064	Cell Biology of Disease	3
BIOL 4134	Human Genetics	3
BIOL 4144	Medical Microbiology	3
BIOL 4225	Genomics and Bioinformatics	3
BIOL 4622	Topics in Immunology	3
BIOL 4634	Biology of Cancer	3
CHEM 3111	Analytical Chemistry	3
CHEM 4121	Instrumental Analysis	3
CHEM 4828	Biochemistry Lab	2
CHEM 4835	Biochemistry of Gene Regulation and Cancer	3

To learn more about the Student Learning Outcomes for this program, please visit our website ([https://clas.ucdenver.edu/integrative-biology/academics/certificates/#biotechnology\\_certificate-93](https://clas.ucdenver.edu/integrative-biology/academics/certificates/#biotechnology_certificate-93)).