

BIOLOGY PROGRAMS

Biology

Associate in Science for Transfer Degree (AS-T)*

The Associate of Science Degree for Transfer (AS-T) in Biology is designed for students who plan to transfer to CSU as biology majors. In this program, they gain exposure to the five main topics of biology (cell, molecular, organismal biology, evolution and ecology).

Students who successfully complete the AS-T in Biology earn specific guarantees for transfer to the CSU system: admission to a CSU with junior status, and priority admission to a CSU campus and to a program or major in biology or a similar major. Students transferring to a CSU campus will be required to complete no more than 60 units after transfer to earn a bachelor's degree.

Students are required to complete 60 semester units that are eligible for transfer to a California State University, including the following: (1) The Intersegmental General Education Transfer Curriculum (IGETC for STEM) Breadth Requirements (31 units) and (2) 39 semester units with a grade of C or better in the major or area of emphasis and an overall minimum grade point average (GPA) of at least 2.0 in all CSU transferable coursework.

Students are advised to consult with a Berkeley City College Counselor for additional information and to verify transfer requirements.

*Please note that students can only take the IGETC for Stem as the GE pattern for this program.

NOTE: Although it is possible to fulfill the requirements for the Associate Degree for Transfer by completing the IGETC for UC pattern, admission to CSU requires completion of an Oral Communication course (IGETC Area 1C; CSU GE Area A-1); therefore, students who plan to transfer to CSU should complete this course as part of their GE or elective units.

<i>Required Courses:</i>		<i>Units</i>
BIOL 1A	General Biology	5
BIOL 1B	General Biology	5
CHEM 1A	General Chemistry	5
CHEM 1B	General Chemistry	5
MATH 3A	Calculus I	5
PHYS 3A	General Physics	5
PHYS 3B	General Physics	5
Select one of the following courses:		
CHEM 30B	Introductory Organic and Biochemistry	4
MATH 13	Introduction to Statistics	4
	Major Requirements:	39
	General Education (IGETC or CSU GE) and Electives:	21
	Total Units:	60

Biology

Associate in Science for Transfer Degree

Recommended Two-Year Course Sequence Beginning in the Fall Semester

You can use the following pattern to complete an Associate in Science in Biology for Transfer degree. This is only one possible pattern. If you wish to earn an associate degree, you must participate in the Student Success Program (Matriculation), which includes assessing academic skills and developing a Student Education Plan (SEP) with a Counselor. This plan will map your sequence of courses to help you complete your degree regardless of the semester you begin classes.

<i>Course</i>		<i>Units</i>
1st Semester/Fall		
MATH 3A	Calculus I	5
CHEM 30B	Introductory Organic and Biochemistry	4
Or		
MATH 13	Introduction to Statistics	4
	General Education and Electives	6
	Total	15
2nd Semester/Spring		
CHEM 1A	General Chemistry	5
PHYS 3A	General Physics	5
	General Education and Electives	5
	Total	15
3rd Semester/Fall		
BIOL 1A	General Biology	5
CHEM 1B	General Chemistry	5
	General Education and Electives	5
	Total	15
4th Semester/Spring		
BIOL 1B	General Biology	5
PHYS 3B	General Physics	5
	General Education and Electives	5
	Total	15

Program Learning Outcomes

Students who complete the program will be able to:

- Demonstrate skills in the scientific methods used in the biological sciences.
- Explain core concepts of biology: chemical makeup of biomolecules and their importance in the structure and function of the cell; functions of organelles, cellular processing, including respiration, photosynthesis, mitosis, meiosis, transcription/translation, and fundamental biological concepts in classical and molecular genetics, and molecular biology; classification, life cycles, physiology, anatomy and development of animals, plants, fungi, protista and prokaryotes.
- Explain the core concepts of evolution and ecology.

Biotechnology

Associate in Science Degree and Certificate of Achievement*

Biotechnology draws from many disciplines, including genetics, immunology, chemistry, physics, and mathematics and computer science. Recent advances in biotechnology have resulted in major contributions to the fields of medicine, public health and agriculture. Berkeley City College's program, which integrates academic and occupational instruction, prepares students for employment in a broad range of laboratories, including those found in industry, research institutions, public health departments, hospitals and clinics. The Certificate of Achievement and the Associate in Science degree in Biotechnology allow students to pursue a variety of positions as bioscience technicians.

Career Opportunities: State and Federal laboratories, academic research laboratories, public and private laboratories, pharmaceutical and biotechnology industries.

<i>Required Courses:</i>		<i>Units</i>
BIOL 3	Microbiology	5
BIOL 10	Introduction to Biology **	4
BIOL 32	Scientific Literature	2
BIOL 33	Applied Immunology	6
BIOL 34	Molecular Genetics	6
BIOL 50A	Introduction to Biotechnology: Techniques and Methods	3
BIOL 50B	Protein Chemistry and Fermentation	3
CHEM 30A	Introductory General Chemistry **	4
CHEM 30B	Introductory Organic and Biochemistry **	4
CIS 200	Computer Concepts and Applications **	1.5
ENGL 1A	Composition and Reading	4
HUMAN 30A	Human Values/Ethics Or PHIL 31A Human Values/Ethics	3
MATH 1	Pre-Calculus **	4
PHYS 10	Introduction to Physics **	4
	Major Requirements	53.5
	General Education and Electives:	6.5
	Total Units:	60

**For the Certificate of Achievement, students must complete the 53.5 units of required courses. For the Associate Degree, students must complete the 53.5 units of required courses plus 6.5 units of General Education requirements and elective courses.*

***You may substitute higher level courses in biology, chemistry, mathematics and physics.*

Biotechnology

Associate in Science Degree

Recommended Two-Year Course Sequence Beginning in the Fall Semester

You can use the following pattern to complete an Associate in Science degree or Certificate of Achievement in Biotechnology. This is only one possible pattern. If you wish to earn an associate degree or certificate, you must participate in the Student Success Program (Matriculation), which includes assessing academic skills and developing a Student Education Plan (SEP) with a Counselor. This plan will map your sequence of courses to help you complete your degree regardless of the semester you begin classes.

<i>Course</i>		<i>Units</i>
	1st Semester/Fall	
BIOL 10	Introduction to Biology	4
ENGL 1A	Composition and Reading	4
CIS 200	Computer Concepts and Applications	1.5
CHEM 30A	Introduction to Inorganic Chemistry	4
	Total	13.5
	2nd Semester/Spring	
BIOL 50A	Introduction to Biotechnology: Techniques and Methods	3
MATH 1	Pre-Calculus	4
PHYS 10	Introduction to Physics	4
CHEM 30B	Introductory Organic and Biochemistry	4
	Total	15
	3rd Semester/Fall	
BIOL 3	Microbiology	5
BIOL 32	Molecular Literature	6
BIOL 34	Scientific Genetics	2
	Total	13
	4th Semester/Spring	
BIOL 33	Applied Immunology	6
BIOL 50B	Protein Chemistry and Fermentation	3
HUMAN 30A	Human Values/Ethics	3
	Total	12

Program Learning Outcomes

Students who complete the program will be able to:

- Demonstrate a facility with laboratory mathematics, an ability to follow scientific protocols, operate standard equipment, handle hazardous materials, work aseptically and make solutions.
- Demonstrate ability to understand and interpret scientific research papers, use scientific databases, construct scientific research papers and use presentation software.
- Demonstrate an ability to select appropriate laboratory tools and experimental materials to conduct experiments, interpret and analyze results, trouble shoot and maintain lab manuals.
- Demonstrate ability to conduct scientific work as a member of a team and alone.
- Demonstrate general knowledge of the ethical issues and key concepts in the fields of general biology, microbiology, immunology, molecular genetics and protein chemistry.

Biotechnology

Certificate of Proficiency

Biotechnology draws from many disciplines, including genetics, immunology, chemistry, physics, and mathematics and computer science. Recent advances in biotechnology have resulted in major contributions to the fields of medicine, public health and agriculture. Berkeley City College's program, which integrates academic and occupational instruction, prepares students for employment in a broad range of laboratories, including those found in industry, research institutions, public health departments, hospitals and clinics. The Certificate of Proficiency is a first step into this exciting field and prepares students for entry level laboratory assistant positions. The Certificate of Achievement and the Associate in Science degree in Biotechnology allow students to pursue a variety of positions as bioscience technicians.

Career Opportunities: Entry level positions as a laboratory assistant in industry, research, public health, hospital and clinical laboratories.

<i>Required Courses</i>		<i>Units</i>
BIOL 10	Introduction to Biology	4
BIOL 50A	Introduction to Biotechnology: Techniques and Methods	3
CHEM 30A	Introductory General Chemistry	4
CIS 200	Computer Concepts & Applications	1.5
MATH 201	Elementary Algebra	4
	Total Units	16.5
Recommended Preparation for this certificate may include:		
ENGL 264A	Preparation for Composition, Reading, and Research	5

Biotechnology
Certificate of Proficiency
Recommended One-Semester or One-Year Course
Starting either in Fall or Spring Semester

This certificate can be completed in one semester providing prerequisites are met. This is only one possible pattern. If you wish to earn a certificate, you must participate in the Student Success Program (Matriculation), which includes assessing academic skills and developing a Student Education Plan (SEP) with a Counselor. This plan will map your sequence of courses to help you complete your degree regardless of the semester you begin classes.

Recommended Preparation prior to enrollment in the program—course offered in the Summer, Fall and Spring Semesters:

<i>Course</i>		<i>Units</i>
ENGL 264A	Preparation for Composition, Reading, and Research	5
	Total	5
1st Semester/Fall or Spring		
BIOL 10	Introduction to Biology	4
CIS 200	Computer Concepts & Applications	1.5
MATH 201	Elementary Algebra	4
	Total	9.5
2nd Semester/Fall or Spring		
BIOL 50A	Introduction to Biotechnology: Techniques and Methods	3
CHEM 30A	Introductory General Chemistry	4
	Total	7

Program Learning Outcomes

Students who complete the program will be able to:

- Demonstrate facility with laboratory mathematics, and an ability to follow scientific protocols, operate standard equipment, handle hazardous materials, work aseptically, and make solutions.
- Demonstrate ability to maintain a detailed and clearly written laboratory manual that contains properly labeled tables and figures and sufficient direction to allow one to repeat the experiments.
- Demonstrate ability to work with a team and individually and to assume responsibility for assigned work.