



# BIOLOGICAL SCIENCE

## **A.S. Degree**

Biological Science  
Health Science

## **Certificate of Achievement**

Biotechnology

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The Biological Science Program at Gavilan Community College provides a quality education that emphasizes critical thinking skills for all students (Majors and Non-majors). Our primary goals are to prepare students to transfer to a 4-year college, enter programs that require our courses as prerequisites, and prepare students for possible employment upon completing certificate and/or graduating with an A.S. degree. It is also our intent to encourage our students to gain practical experience in biological science by working with our faculty and local industry.

## Biological Science *A.S. Degree*

### REQUIREMENTS:

CHEM 1A/B	General Chemistry	5-5	units
BIO 1	General Biology	4	units
BIO 4	General Zoology	4	units
BIO 5	General Botany	4	units
PHYS 2A/B	General Physics	4-4	units
Total Units Required:		30	UNITS

Plus completion of general education requirements: units vary  
Total Units Required: minimum of 60 UNITS

### Recommended Electives:

BIO 7, AH/BIO 8, 9, BIO 13, AH/BIO 15 (AH/BIO 15 may only be taken before BIO 7 and AH/BIO 9), BIO 21; BIOT 105; ECOL 1; MATH 1A/B

Students completing the courses will have satisfied requirements for physical and biological sciences. See the Gavilan general education requirements on page 48.

Recommended preparation for the major requirements listed.

1. One year of high school chemistry or CHEM 30A (Elementary Chemistry) or equivalent, and/or Bio 10 or equivalent.
2. At a minimum be eligible to enter ENGL 250 and ENGL 260.
3. Two years of high school math or MATH 233.

**Program Learning Outcomes:** After completing the Biological Science major a student will be able to:

- ▶ Use raw experimental data to conduct statistical analysis, and present conclusions in a graphical and narrative form.
- ▶ Find, select and evaluate various types of scientific information including primary research articles, mass media sources and world-wide web information.
- ▶ Effectively communicate scientific concepts in both written and oral formats.
- ▶ Identify the evolutionary processes that lead to adaptation and biological diversity.
- ▶ Describe the relationship between life forms and their environment and ecosystems.
- ▶ Explain the basic structures and fundamental processes of life at molecular, cellular and organismal levels.
- ▶ Demonstrate the correct operating procedures in the use of common lab equipment such as compound microscopes, spectrophotometer, pH meter, electrophoresis gel apparatus, micropipettes, and centrifuges.

**General Education Requirements:** A student may complete the Gavilan College AA/AS general education, the CSU-GE Breadth or the IGETC pattern, plus sufficient electives to meet a 60 unit total. See pages 48-56 or see a counselor for details.

**NOTE:** A course may be used to satisfy both general education and major courses. See "Double Counting Rule" on page 46.

## Biotechnology *Certificate of Achievement*

### REQUIREMENTS:

BIOT 103	Biotechnology Lab Skills and Instrumentation	4 units
BIOT 104	Seminar in Biotechnology	1 unit
BIO 10	Principles of Biology	4 units
CHEM 30A	Elementary Chemistry	4 units
CHEM 30B	Elementary Organic and Biochemistry	4 units
Total Units Required for Certificate of Achievement:		17 UNITS

This certificate program allows students to attain essential skills in biotechnology and provides opportunities to learn basic laboratory procedures, how to record data, perform basic calculations and write laboratory reports. Students also learn about careers and ethical issues in biotechnology.

**Career Options:** Careers for those with a Biotechnology Certificate of Achievement would be animal care technician, assay analyst, laboratory assistant or technician, manufacturing technician, QA/QC technician. In addition to the biotechnology industry, jobs for technicians may be found in environmental testing labs, forensic labs, hospitals, plant pathology labs, research labs and wineries.

Gainful Employment Statistics for Certificate		
Name of Program: (if different than the CIP program description)	CA in Biotechnology	
Program Length: (in years)	1.00	
# of units/credits required for program:	17	
Total Tuition and Required Fees for the entire program completed in normal time:	CA Resident	Nonresident
	\$ 654	\$ 3,714
Total estimated costs for books and supplies for the entire program:	\$ 1,620	
Total room and board charges for living on campus:	College does not offer on-campus living.	
For more information visit the Gavilan College Gainful Employment website at <a href="http://www.gavilan.edu/gainful_employment">http://www.gavilan.edu/gainful_employment</a> . Fees based on fall 2011 per-unit rates.		

## Health Science *A.S. Degree*

### REQUIREMENTS:

AH 3	The Person in the Life Cycle	.3 units
AH/BIO 11	Nutrition	.3 units

Choose one of the following:

CHEM 1A or 1B	General Chemistry (5 units)	4-5 units
CHEM 30A	Elementary Chemistry (4 units)	
CHEM 30B	Elementary Organic and Biochemistry (4 units)	
BIO 1	General Biology (4 units)	
BIO 10	Principles of Biology (4 units)	
AH/BIO 15	Survey Human Anatomy and Physiology (5 units)	

Choose two of the following:

BIO 7	Human Anatomy (4 units)	9-10 units
AH/BIO 8	General Microbiology (5 units)	
AH/BIO 9	Human Physiology (5 units)	

Total Units Required: 19-21 UNITS

Plus completion of general education requirements: units vary  
 Total Units Required: minimum of 60 UNITS

**Recommended Electives:** AH/BIO 11; MATH 233 or higher; ECOL 1; PSYC 1A

The degree in Health Science is intended for students who plan to pursue a more advanced degree or certificate in a health career.

**Career Options:** Careers for those with an Associate's Degree in Health Science will be able to work as a health educator, pre-professional in X-ray technology, dental hygienist, physician's assistant or in another related health career.

**General Education Requirements:** A student may complete the Gavilan College AA/AS general education, the CSU-GE Breadth or the IGETC pattern, plus sufficient electives to meet a 60 unit total. See pages 48-56 or see a counselor for details.

**NOTE:** A course may be used to satisfy both general education and major courses. See "Double Counting Rule" on page 46.