

BS IN BIOLOGICAL SCIENCE (FORENSIC BIOLOGY)

Units required for Major: 73-85, includes units of study in chosen concentration (see below).

Total units required for BS: 120

Program Description

The curriculum in Forensic Biology is designed to prepare students for careers as criminalist specializing in the analysis and interpretation of serological and DNA evidence. This curriculum meets the educational requirements for entry level career positions with city, county, and federal agencies. Students selecting this concentration are urged to pursue internship opportunities (BIO 195), such as those available through the Sacramento County Coroner's Office, and/or directed research (BIO 199A or BIO 199B) with a faculty member in Biological Sciences or Chemistry who utilizes molecular biology techniques and instrumentation. Students completing the requirements for a concentration in Forensic Biology also fulfill the requirements for a minor in Chemistry.

Pre-Major Requirements

The Biological Sciences program at Sacramento State is one of the most highly sought after programs in Northern California. Due to the large number of applications, the program is now officially impacted. Students wishing to become Biological Science majors must complete a series of required lower division and then must apply for admission to the program. Check the department website for requirements, and it is highly recommended that interested students speak with an advisor at the Natural Sciences Advising Center (NSAC) as soon as possible.

Freshmen interested in the major are admitted as pre-Biological Science majors.

To change to the Biological Sciences major, pre-major students are required to complete the following courses and grade requirements and submit a Declaration of Major form to the Biological Science Department Office along with transcript copies.

1. Completion of the following lower division "pre-major" courses with a minimum "C" or better. Only first or second attempt will be considered:

Code	Title	Units
BIO 1	Biodiversity, Evolution and Ecology	5
BIO 2	Cells, Molecules and Genes	5
CHEM 1A	General Chemistry I	5
STAT 1	Introduction to Statistics	3
ENGL 5	Accelerated Academic Literacies ¹	3

1. Overall GPA of 2.5 based on the pre-major courses listed above.
2. Minimum of 30 units completed at the college level.

¹ Course also satisfies General Education (GE)/Graduation Requirement.

Program Requirements

Code	Title	Units
Required Lower Division Core Courses (37-41 Units)		
BIO 1	Biodiversity, Evolution and Ecology ¹	5
BIO 2	Cells, Molecules and Genes	5
CHEM 1A	General Chemistry I ¹	5
CHEM 1B	General Chemistry II	5
Select one of the following:		3 - 6
CHEM 20	Organic Chemistry Lecture–Brief Course ²	
CHEM 24 & CHEM 124	Organic Chemistry Lecture I & Organic Chemistry Lecture II	
Select one of the following:		3 - 4
MATH 26A	Calculus I for the Social and Life Sciences	
MATH 30	Calculus I	
PHYS 5A	General Physics: Mechanics, Heat, Sound	4
PHYS 5B	General Physics: Light, Electricity and Magnetism, Modern Physics	4
STAT 1	Introduction to Statistics ¹	3
Required Upper Division Core Courses (6 Units)		
BIO 100	Introduction to Scientific Analysis	2
BIO 184	General Genetics	4
Concentration (30-38 Units)		
Select from the following concentrations:		30 - 38
General Biology		
Biomedical Sciences		
Cell and Molecular Biology		
Clinical Laboratory Sciences		
Ecology, Evolution, and Conservation		
Forensic Biology		
Microbiology		
Total Units		73-85

- 1 Course also satisfies General Education (GE)/Graduation Requirement.
- 2 CHEM 24 and CHEM 124 may be taken in lieu of CHEM 20. (CHEM 124 is not counted toward the 36 upper division unit requirement in the major except in the Biomedical Sciences Concentration.)

Notes:

- Pre-Health Professional students should take the Chemistry and Math requirements as stated in the Pre-Health Professional Program section of this catalog.
- With approval, up to six units of upper division coursework from related fields may be applied as electives in the major.
- No more than 2 units from the following combined can be applied to the Biological Sciences upper division major requirement.

Code	Title	Units
BIO 195	Biological Internship	1 - 2

BIO 197A	Laboratory Teaching Assistant	1 - 2
BIO 197B	Laboratory Techniques	1 - 2
BIO 197C	Co-curricular Activities in Biology	1 - 2
BIO 199A	Introductory Undergraduate Research	1 - 2
BIO 199B	Directed Readings	1 - 2

Concentration in Forensic Biology (38 units)

Code	Title	Units
Required Courses (32 Units)		
BIO 121	Molecular Cell Biology	3
BIO 150	Forensic Biology	3
BIO 151	Advanced Laboratory Techniques in Forensic Biology	2
BIO 180	Advanced Molecular Biology	4
CHEM 20L	Introductory Organic Chemistry Laboratory	1
CHEM 31	Quantitative Analysis	4
CHEM 161	General Biochemistry ¹	3
CHEM 162	General Biochemistry Laboratory ²	3
CRJ 4	General Investigative Techniques	3
CRJ 154	Introduction to Physical Evidence	3
Select one of the following: 3		
CRJ 112	Gangs and Threat Groups in America	
CRJ 114	Sexual Offenses and Offenders	
CRJ 118	Drug Abuse and Criminal Behavior	
Elective Courses (6 Units)		
Select one of the following Structure and Function electives: 3		
BIO 104	Physiology of Human Reproduction	
BIO 122	Advanced Human Anatomy	
BIO 123	Neuroanatomy	
BIO 126	Comparative Vertebrate Morphology	
BIO 127	Developmental Biology	
BIO 128	Plant Anatomy and Physiology	
BIO 130	Histology	
BIO 131	Systemic Physiology	
BIO 132	Neurophysiology	
BIO 133	Cardiovascular, Respiratory and Renal Physiology	
Select one of the following Ecology, Evolution, and Biodiversity electives: 3		
<i>Part A: Biodiversity Electives</i>		
BIO 103	Plants and Civilization	
BIO 112	Plant Taxonomy	
BIO 145	The Diversity of Microorganisms	
BIO 152	Human Parasitology	
BIO 157	General Entomology	
BIO 162	Ichthyology: The Study of Fishes	
BIO 164	Amphibians and Reptiles: An Introduction to Herpetology	
BIO 166	Ornithology	

BIO 168	Mammalogy	
<i>Part B: Ecology and Evolution Electives</i>		
BIO 113	Evolution and Speciation in Flowering Plants	
BIO 118	Natural Resource Conservation	
BIO 160	General Ecology	
BIO 169	Animal Behavior	
BIO 173	Principles of Fisheries Biology	
BIO 179	Conservation Biology & Wildlife Management	
BIO/ENVS 186B	Ecological and Environmental Issues Seminar	
BIO 188	Evolution	

Total Units 38

¹ CHEM 160A and CHEM 160B may be taken in lieu of CHEM 161. Only three units of the package may be counted toward the upper division requirement.

² CHEM 162 can be included in the 36 upper division unit requirement for this concentration.

Note: Students with a declared concentration in Forensic Biology do not need to take CRJ 1, CRJ 2 or CRJ 102 as prerequisites for the CRJ courses required in this concentration.

General Education Requirements ¹

Code	Title	Units
Area A: Basic Subjects (6 Units)		
A1	Oral Communication	3
A2	Written Communication ²	0
A3	Critical Thinking	3
Area B: Physical Universe and Its Life Forms (3 Units)		
B1	Physical Science ²	0
B2	Life Forms ²	0
B3	Lab (Note: Lab experience to be taken with one of the following: B1, B2 or B5 ²)	0
B4	Math Concepts ²	0
B5	Additional Course (Any B to reach 12 units) - Take upper-division course to complete Area & upper division requirements.	3
Area C: Arts and Humanities (12 Units)		
C1	Arts	3
C2	Humanities	3
C1/C2	Area Course C	3
C1/C2	Area C Course - Take upper-division course to complete Area & upper division requirements.	3
Area D: The Individual and Society (12 Units)		
Area D Course		3
Area D Course		3
Area D Course		3
Area D Course	- Take upper-division course to complete Area & upper division requirements.	3
Area E: Understanding Personal Development (3 Units)		
Area E Course		3
Total Units		36

¹ To help you complete your degree in a timely manner and not take more units than absolutely necessary, there are ways to use single courses to meet more than one requirement (overlap). For further information, please visit the General Education page (<http://catalog.csus.edu/colleges/academic-affairs/general-education>).
Note: There is no way to list all possible overlaps so please consult with a professional advisor. The Academic Advising Center can be visited online (<http://www.csus.edu/acad>), by phone (916) 278-1000, or email (advising@csus.edu).

² Required in Major; also satisfies GE.

Graduation Requirements ¹

Code	Title	Units
Graduation Requirements (required by CSU) (9 Units)		
	American Institutions: U.S. History	3
	American Institutions: U.S. Constitution & CA Government	3
	Writing Intensive (WI)	3
Graduation Requirements (required by Sacramento State) (12 Units)		
	English Composition II	3
	Race and Ethnicity in American Society (RE)	3
	Foreign Language Proficiency Requirement ²	6

¹ To help you complete your degree in a timely manner and not take more units than absolutely necessary, there are ways to use single courses to meet more than one requirement (overlap). For further information, please visit the General Education page (<http://catalog.csus.edu/colleges/academic-affairs/general-education>).
Note: There is no way to list all possible overlaps so please consult with a professional advisor. The Academic Advising Center can be visited online (<http://www.csus.edu/acad>), by phone (916) 278-1000, or email (advising@csus.edu).

² If not satisfied before entering Sacramento State, it may be satisfied in General Education Area C2 (Humanities). "C- or better required." The alternative methods for satisfying the Foreign Language Proficiency Requirement are described here: <https://www.csus.edu/wll/flgr/>