

BA IN BIOLOGICAL SCIENCE

Units required for Major: 63-67

Total units required for BA: 120

Program Description

The Department of Biological Sciences offers both undergraduate and graduate degree programs. At the undergraduate level, students are able to earn a Bachelor of Arts degree, a Bachelor of Science degree, or a Minor in Biological Sciences.

Program Requirements

Code	Title	Units
Required Lower Division 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 Courses (23 Units)		
BIO 100	Introduction to Scientific Analysis	3
BIO 121	Molecular Cell Biology	3
BIO 139	General Microbiology	4
BIO 160	General Ecology	3
BIO 184	General Genetics	4
BIO 188	Evolution	3
CHEM 161	General Biochemistry ³	3
Elective Courses (3 Units)		
Select one course from the following Electives:	Structure and Function	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	

BIO 135	Endocrinology	Total Units	63-67
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- 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 24 upper division unit requirement in the major.)
³ 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 major requirement.

Notes:

- Pre-Health Professional students should take the Chemistry and Math requirements as stated in the Pre-Health Professional Program section of this catalog.

General Education Requirements ¹

Code	Title	Units
Area A: Basic Subjects (9 Units)		
A1	Oral Communication	3
A2	Written Communication	3
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 C Course	3
C1/C2	Area C Course - Take upper-division course to complete Area & upper division requirements.	3
Area D: The Individual and Society (9 Units)		
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
Area F: Ethnic Studies (3 Units)		
Area F Course		3
Total Units		39

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 (<https://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

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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/college/arts-letters/world-languages-literatures/foreign-language-requirement.html> (<https://www.csus.edu/college/arts-letters/world-languages-literatures/foreign-language-requirement.html>)

The following roadmaps are sample planning resources. Please consult your academic advisor and Academic Catalog for graduation requirements as you develop your individualized academic plan.

Biological Science, BA: 4-Year Roadmap

Course	Title	Units
Year 1		
First Semester		
MATH 26A or MATH 30	Calculus I for the Social and Life Sciences ³ or Calculus I	3 - 4
GE Area 1B - Critical Thinking ²		3
GE Area 4 - Social & Behavioral Sciences ²		3
GE Area 6 - Ethnic Studies ²		3
Elective of Choice		3
Units		15-16
Second Semester		
CHEM 1A	General Chemistry I	5
STAT 1	Introduction to Statistics	3
GE Area 1A - English Composition ²		3
GE Area 1C - Oral Communication ²		3
Units		14
Year 2		
First Semester		
BIO 1	Biodiversity, Evolution and Ecology	5

CHEM 1B	General Chemistry II	5
ENGL 20	College Composition II	3
Elective of Choice		3

Units 16

Second Semester		
BIO 2	Cells, Molecules and Genes	5
CHEM 20 or CHEM 24 or CHEM 124	Organic Chemistry Lecture– Brief Course ³ or Organic Chemistry Lecture I or Organic Chemistry Lecture II	3
GE Area 3B - Humanities ²		3
GR American Institutions (US History) ²		3

Units 14

Year 3		
First Semester		
BIO 100	Introduction to Scientific Analysis	3
BIO 184	General Genetics	4
GE Area 3A - Arts ²		3
Foreign Language Semester 1 ²		4
Upper Division Elective		3

Units 17

Second Semester		
BIO 121	Molecular Cell Biology	3
BIO 160	General Ecology	3
CHEM 161	General Biochemistry	3
Foreign Language Semester 2 ²		4
GR American Institutions (GOVT) ²		3

Units 16

Year 4		
First Semester		
BIO 139	General Microbiology	4
BIO 188	Evolution	3
PHYS 5A	General Physics: Mechanics, Heat, Sound	4
Upper Division GE Area 4 - Social & Behavioral Sciences ²		3

Units 14

Second Semester		
PHYS 5B	General Physics: Light, Electricity and Magnetism, Modern Physics	4
Biological Science Elective ³		3
Upper Division GE Area 3 - Arts or Humanities + Writing Intensive ²		3
Upper Division Elective		3
Upper Division Elective		3

Units 16

Total Units 122-123

Biological Science, BA: 2-Year Roadmap

Course	Title	Units
Year 1		
First Semester		
BIO 100	Introduction to Scientific Analysis	3
BIO 184	General Genetics	4
Foreign Language Semester 1 ²		4
GR American Institutions (US History) ²		3
Units		14
Second Semester		
BIO 121	Molecular Cell Biology	3

BIO 160	General Ecology	3
CHEM 161	General Biochemistry	3
Foreign Language Semester 2 ²		4
GR American Institutions (GOVT) ²		3
Units		16
Year 2		
First Semester		
BIO 139	General Microbiology	4
BIO 188	Evolution	3
Upper Division GE Area 4 - Social & Behavioral Sciences ²		3
Upper Division Elective		3
Upper Division Elective		3
Units		16
Second Semester		
Biological Science Elective ³		3
Upper Division GE Area 3 - Arts or Humanities + Writing Intensive ²		3
Upper Division Elective		3
Upper Division Elective		3
Upper Division Elective		3
Units		15
Total Units		61

¹. Any course not completed in the first semester should be taken in the second or a later semester.

². Please see General Education/Graduation Requirement **course options** (https://www.csus.edu/academic-affairs/curriculum-workflow/_internal/_documents/program-road-maps/als_2yr/art_transfer-roadmap-2024-25.pdf).

³. Please see an academic advisor for elective options.