

# BIOLOGY, BS, CONCENTRATION IN BIOTECHNOLOGY

Natural Sciences, Mathematics, and Engineering (nsme) (<https://catalog.csub.edu/general-information/csub-information/school-natural-sciences-mathematics-engineering/>)

Department of Biology (<https://catalog.csub.edu/general-information/csub-information/school-natural-sciences-mathematics-engineering/department-biology/>)

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[www.csub.edu/Biology](http://www.csub.edu/Biology) (<http://www.csub.edu/Biology/>)

The Department of Biology offers the Bachelor of Science in Biology with or without a concentration in Biotechnology, the Bachelor of Arts in Human Biological Sciences, and the Master of Science in Biology. Throughout its curriculum the Department emphasizes evolution and the relationship between organisms and the environment. Classes include extensive field and laboratory investigations allowing students to observe and measure biological systems. Students are encouraged to select elective courses best suited to their interests. See Biology Tracks below. A detailed description of student learning goals and objectives can be found at <http://www.csub.edu/biology/>.

## Program Requirements

### Requirements for the major in Biology with a Concentration in Biotechnology

The Bachelor of Science in Biology with a concentration in Biotechnology curriculum includes a specific set of courses designed to provide students with a foundation in Biotechnology related fields. Students seeking a Bachelor of Science degree with a major in Biology and a concentration in Biotechnology must complete the following:

Code	Title	Units
<b>General Education Requirements</b>		
	First-Year Seminar (FYS)	2
	Lower Division Area A: Foundational Skills	9
	Lower Division Area B: Natural Sciences <sup>4</sup>	0
	Lower Division Area C: Arts and Humanities	6
	Lower Division Area D: Social and Behavioral Sciences	3
	Lower Division Area E: Student Enrichment and Lifelong Learning (SELF) <sup>5</sup>	0
	Lower Division Area F: Ethnic Studies	3
	American Institutions: Government and History	6
	Junior Year Diversity & Reflection (JYDR)	3
	Graduation Writing Assessment Requirement (GWAR)	3
	Upper Division Thematic Area C and D	6
	General Education Capstone <sup>5</sup>	0
	<i>General Education Subtotal</i>	<i>41</i>

### Major Requirements

<i>Biology courses</i> <sup>1</sup>		
Core Requirements		
BIOL 2010	Introductory Biology - Cells <sup>2</sup>	4
BIOL 2110	Introductory Biology - Animals	4
BIOL 2120	Introductory Biology - Plants	4
BIOL 3010	General Genetics	3
BIOL 3020	General Physiology	3
BIOL 3110	General Ecology	3
BIOL 3120	Research Design and Analysis	4
BIOL 4100	Evolution	3
BIOL 4918	Senior Seminar	1
Concentration Specific		
BIOL 3410	General Microbiology	4
BIOL 4440	Molecular Genetics	4
At least 8 units of additional upper division elective coursework in Biology that must include two laboratory courses at the 4000-level.		8
<i>Cognates</i> <sup>3</sup>		
CHEM 1000	Foundations of Chemistry	3
CHEM 1001	Foundations of Chemistry Laboratory	2
CHEM 1100	Foundations of Analytical Chemistry	2
CHEM 2300	Foundations of Organic Chemistry	3
CHEM 2400	Foundations of Biochemistry	2
CHEM 3300	Intermediate Organic Chemistry	3
CHEM 3301	Organic Chemistry Laboratory I	2
PHYS 2110	College Physics I	4
PHYS 2120	College Physics II	4
MATH 2010	Calculus for the Biological and Chemical Sciences I	4
<i>Major Subtotal</i>		<i>74</i>
<b>Additional Units Needed Towards Graduation</b> <sup>6</sup>		<b>12</b>
<b>Total Units</b>		<b>127</b>

<sup>1</sup> A minimum GPA for these 45 units is 2.0

<sup>2</sup> **Note:** A grade of C- or better is required to advance into upper division Biology courses.

<sup>3</sup> A minimum GPA for these 30 units is 2.0

<sup>4</sup> A modification to the standard GE program has been approved that allows the possibility of satisfying some GE requirements through the major. BIOL 2010 Introductory Biology - Cells or BIOL 2110 Introductory Biology - Animals satisfies B2, MATH 1050 Precalculus I or higher satisfies B4, and CHEM 1000 Foundations of Chemistry satisfies B1.

<sup>5</sup> The SELF requirement is met by completing a LD Area B, C, or D course with a SELF component..

<sup>6</sup> Biotechnology majors are encouraged to consider taking additional upper-division biology elective courses or additional upper-division scientific cognate courses to fulfill their university-wide additional unit requirement. Depending on student career objectives, faculty advisors may be able to recommend courses that would be appropriate, and students are encouraged to speak with their faculty advisor about course options.