

BIOLOGY, B.A.

Program Learning Outcomes

Students who complete the B.A. program in Biology will be able to:

1. Demonstrate an understanding of the process of science and of the concepts and theories of biology across a broad range of organizational levels: molecular, cellular, organismal, and ecological (population, community, ecosystem).
2. Participate in the life of the Biology Department by involvement in one or more of the following areas: research, biology clubs, and/or various positions of responsibility serving as graders, tutors, and/or teaching assistants.
3. Develop a rationally defensible integration of science and faith.
4. Be prepared for post-graduate studies or science-related careers.

Code	Title	Units
Lower-Division Requirements		
BIO 2010 and BIO 2010L	Cell Biology and Biochemistry (GE) and Cell Biology and Biochemistry Lab (GE) ¹	4
BIO 2011 and BIO 2011L	Ecological and Evolutionary Systems (GE) and Ecological and Evolutionary Systems Lab (GE) ¹	4
BIO 2012 and BIO 2012L	Organismal Biology and Organismal Biology Lab	4
CHE 1052 and CHE 1052L	General Chemistry I (GE) and General Chemistry I Lab (GE) ¹	5
CHE 1053 and CHE 1053L	General Chemistry II and General Chemistry II Lab	4
CHE 2094 and CHE 2094L	Organic Chemistry I and Organic Chemistry I Lab ¹	4
MTH 1044	Calculus with Applications (GE) ¹	4
Upper-Division Requirements		
BIO 3045 and BIO 3045L	Genetics and Genetics Lab	4
BIO 3052	Research Methodology	3
BIO 3063 and BIO 3063L	Conservation Ecology and Conservation Ecology Lab	4
BIO 4097	Biology Seminar	1
MTH 3063	Calculus Based Statistics with R	3
Elective Courses		
Choose a minimum of twelve (12) units of electives from the following: ²		12
BIO 3015 and BIO 3015L	Microbiology and Microbiology Lab	
BIO 3023 and BIO 3023L	Introduction to Oceanography and Introduction to Oceanography Lab	
BIO 3033 and BIO 3033L	Marine Biology and Marine Biology Lab	
BIO 3040 and BIO 3040L	Field Biology: Neotropical Ecology and Field Biology: Neotropical Ecology Lab	
BIO 3050 and BIO 3050L	Advanced Cell Biology and Advanced Cell Biology Lab	
BIO 3060	Ethnobotany	
BIO 3070	Sustainable Agriculture	

BIO 3080 and BIO 3080L	Molecular Biology and Molecular Biology Lab
BIO 3090 and BIO 3090L	Immunology and Immunology Lab
BIO 4000 and BIO 4000L	Developmental Biology and Developmental Biology Lab
BIO 4010 and BIO 4010L	Vertebrate Biology and Vertebrate Biology Lab
BIO 4023 and BIO 4023L	Advanced Human Physiology and Advanced Human Physiology Lab
BIO 4030 and BIO 4030L	Animal Behavior and Animal Behavior Lab
BIO 4050 and BIO 4050L	Advanced Biochemistry and Advanced Biochemistry Lab
BIO 4063	Learning and Teaching in Science
BIO 4070	Neuroscience
BIO 4073 and BIO 4073L	Experimental Marine Ecology and Experimental Marine Ecology Lab
BIO 4083	Introduction to Geographic Information Systems (GIS)
BIO 4090 or BIO 4099	Internship in Biology Research in Biology

Total Units **56**

¹ 12 units meet General Education requirements.

² Courses and their corresponding lab (if applicable) must be taken concurrently.

4-Year Credential Track: Single Subject Teaching Credential

Majors in the Bachelor of Arts and Bachelor of Science degrees complete a minimum of 128 units to graduate. The following majors have the option of choosing the 4-year credential track by fulfilling additional units within the undergraduate degree in fulfillment of the Single Subject California Teaching Credential.

- Art Education, B.A. (<https://pointloma-public.courseleaf.com/tug-catalog/colleges-schools-departments/shape/art/art-education-ba/>) (Single Subject Art California Teaching Credential)
- Biology, B.A. (p. 1) (Single Subject Science California Teaching Credential)
- English, B.A. (<https://pointloma-public.courseleaf.com/tug-catalog/colleges-schools-departments/shape/ljwl/english-ba/>) (Single Subject English Teaching Credential)
- French, B.A. (<https://pointloma-public.courseleaf.com/tug-catalog/colleges-schools-departments/shape/ljwl/french-ba/>) (Single Subject World Languages: French California Teaching Credential)
- History, B.A. (<https://pointloma-public.courseleaf.com/tug-catalog/colleges-schools-departments/shape/hps/history-ba/>) (Single Subject Social Sciences Teaching Credential)
- Mathematics, B.S. (<https://pointloma-public.courseleaf.com/tug-catalog/colleges-schools-departments/stem/mics/mathematics-bs/>) (Single Subject Mathematics Teaching Credential)
- Music Education, B.A. (<https://pointloma-public.courseleaf.com/tug-catalog/colleges-schools-departments/shape/mus/music-education-ba/>) (Single Subject Music California Teaching Credential)

- Spanish, B.A. (<https://pointloma-public.courseleaf.com/tug-catalog/colleges-schools-departments/shape/ljwl/spanish-ba/>) (Single Subject World Languages: Spanish California Teaching Credential)
- Sport Science, B.S. (<https://pointloma-public.courseleaf.com/tug-catalog/colleges-schools-departments/chs/kin/sport-science-bs/>) (Single Subject Physical Education California Teaching Credential)

For the 4-year credential track, the following 3000 or 4000-level credential courses are strategically added to the undergraduate degree course plan. These courses represent the required courses for the California SB2042 Single Subject Teaching Credential. Students desiring to enroll in the 4-year credential track would need to make application to the Teacher Education program before entry in the 3rd credential course, meeting all program, university and state requirements for classroom observations and tests required prior to student teaching. Students will be vetted through a screening process, which may include a faculty interview, prior to being placed in student teaching. Candidates major in the academic discipline of their choice (e.g. Kinesiology) and are co-advised by both departments throughout their undergraduate program.

Candidates may also apply to the School of Education Graduate Program to fulfill the remaining requirements toward the California Teaching Credential(s). Any 4000-level courses cross listed with the 6000-level credential courses cannot be repeated between the undergraduate and graduate programs. At the point that the requirements for the undergraduate degree are fulfilled, the candidate would apply to the Graduate School of education and complete the remaining courses required for the credential post-baccalaureate.

The following courses may be used for the credentialing purposes in the State of California. When taken prior to the posting of a baccalaureate degree, unit values may not be applied toward master's degree courses. Other appropriate master's degree-level courses must be substituted for unit values.

Requirements

Code	Title	Units
EDU 3002	Foundations of Education and Learning Theory ¹	3
EDU 3006	Principles of Language Acquisition ¹	3
EDU 4004	Foundations of Special Education ¹	3
EDU 4009	Classroom Assessment and Research Practices	3
EDU 4017	Teaching and Learning Capstone: Contemporary Issues in the Vocation of Education	2
EDU 4020	Literacy Instruction for Secondary Teachers ¹	3
EDU 4021	General Methods for Secondary Teachers ¹	3
EDU 4050	Secondary Clinical Practice I	4
EDU 4055	Secondary Clinical Practice II	4
EDU 40CP1	Clinical Practice Seminar I	1
EDU 40CP2	Clinical Practice Seminar II	1
Choose one (1) course from the following based on major:		3
EDU 4032	Methods of Teaching Secondary Language Arts	
EDU 4033	Methods for Teaching Secondary Mathematics (Mathematics Majors)	
EDU 4034	Methods of Teaching Secondary Science (Biology Major) ²	
EDU 4035	Methods of Teaching Secondary Social Science (History Majors)	
EDU 4036	Methods for Teaching Secondary Foreign Language (French/Spanish Majors)	

EDU 4037	Methods for Teaching Secondary Visual Arts (Art Education Majors) ³	
EDU 4038	Methods for Teaching Secondary Physical Education (Exercise and Sports Science Majors)	
EDU 4039	Content-Specific Pedagogy for Secondary Teachers (Music Education Majors) ⁴	
Total Units		33

¹ Requires 20 hours of supervised field experience working with students in a classroom setting.

² BIO 4063 also satisfies this credential requirement.

³ ART 4055 also satisfies this credential requirement.

⁴ MUE 4054 also satisfies this credential requirement.