

Biology

Biologists study many aspects of how *life* operates – from the molecular details of how cells work to how entire ecosystems function. The course offerings in the Cal Lutheran Biology Department reflect this diversity, with courses ranging from molecular to marine biology.

The Biology Department emphasizes “doing” science rather than listening to it or reading about it. Small classes and the availability of a faculty with diverse research interests allow students to get involved in ongoing scholarship. Students are encouraged to join faculty mentors as collaborators, either in formal laboratory or field classes, or in mentored research outside of the classroom. Undergraduate research projects help make Cal Lutheran graduates more competitive in their chosen career paths.

At Cal Lutheran, biology majors typically focus on one of three general career paths: health careers, which include physician, dentist, veterinarian or physical therapist; research in biological fields such as botany, physiology, marine biology, ecology, genetics or molecular biology; or teaching.

Careers in biology are available in both government and private companies and include positions in research, teaching, administration and sales of pharmaceuticals or medical equipment. In addition, the growing areas of genetics and biotechnology provide many career opportunities. The global biotechnology company Amgen is located near the University and hires Cal Lutheran graduates each year.

Likewise, many biology majors from Cal Lutheran are accepted into medical, dental and graduate schools throughout the United States.

Students interested in careers in teaching may obtain teaching credentials through the School of Education.

Bachelor of Arts in Biology

32 credits minimum, 20 credits upper division. At least 16 biology units must be taken at CLU.

BIOL 120	Introduction to Ecology and Populations	3
BIOL 121	Introduction to Cells and Organisms	3
BIOL 122	Introduction to Metabolism, Genes and Development	3
BIOL 123L	Introduction to Biological Experimentation I	2
BIOL 124L	Introduction to Biological Experimentation II	2
BIOL 311	Evolution	3
Select one of the following: (Biol 399, 498, 499 - Dept Honors Option)		8-3
BIOL 399/498/499 or BIOL 463	Junior Honors and Senior Honors I - Capstone and Senior Honors II - Capstone Scientific Literature	
Select three courses from the following with at least one from each category:		12
Molecular and Cellular Biology		
BIOL 331/331L	Genetics and Genetics Lab	
BIOL 375/375L	Cell Biology and Cell Biology Lab	
BIOL 425/425L	Biochemistry and Biochemistry Lab	
BIOL 426/426L	Molecular Biology and Molecular Biology Lab	
BIOL 428/428L	Virology and Virology Lab	
BIOL 438/438L	Immunology and Immunology Lab	
Organismal Biology and Ecology		
BIOL 325/325L	Environmental Ecology and Environmental Ecology Lab	
BIOL 333/333L	Ecology and Ecology Lab	
BIOL 345/345L	Marine Biology and Marine Biology Lab	
BIOL 352/352L	Oceanography and Oceanography Lab	
BIOL 361/361L	Microbiology and Microbiology Lab	
BIOL 437/437L	Herpetology and Herpetology Lab	
BIOL 452/452L	California Plant Communities and California Plant Communities Lab	
Functional Biology		
BIOL 341/341L	Comparative Anatomy and Comparative Anatomy Lab	
BIOL 342/342L	Developmental Biology and	
BIOL 343/343L	Invertebrate Zoology and Invertebrate Zoology Lab	
BIOL 350/350L	Introduction to Neuroscience and Neuroscience Lab	
BIOL 461/461L	Vertebrate Physiology and Vertebrate Physiology Lab	

Upper Division Biology Elective Credits (if needed)	0-2
Total Hours	36-33

Required Supporting Courses

MATH 231	Statistics for the Science (or a statistics course taught in a math department)	4
or MATH 251	Calculus I	
CHEM 151	General Chemistry	4
CHEM 151L	General Chemistry Lab	1
CHEM 152	General Chemistry II	4
CHEM 152L	General Chemistry II Lab	1
Select one of the following:		4
CHEM 331/341	Organic Chemistry and Organic Chemistry Lab	
CHEM 201/201L	Elementary Organic Chemistry and Elementary Organic Chemistry Lab	
Total Hours		18

Bachelor of Science in Biology

40 credits minimum, 28 credits upper division. At Least 16 biology units must be taken at CLU.

BIOL 120	Introduction to Ecology and Populations	3
BIOL 121	Introduction to Cells and Organisms	3
BIOL 122	Introduction to Metabolism, Genes and Development	3
BIOL 123L	Introduction to Biological Experimentation I	2
BIOL 124L	Introduction to Biological Experimentation II	2
BIOL 311	Evolution	3
Select one of the following: (Biol 399, 498, 499 - Dept Honors Option)		8-3
BIOL 399/498/499	Junior Honors and Senior Honors I - Capstone and Senior Honors II - Capstone	
or BIOL 463	Scientific Literature	
Select four courses from the following with at least one from each category: ¹		16
Molecular and Cellular Biology		
BIOL 331/331L	Genetics and Genetics Lab	
BIOL 375/375L	Cell Biology and Cell Biology Lab	
BIOL 425/425L	Biochemistry and Biochemistry Lab	
BIOL 426/426L	Molecular Biology and Molecular Biology Lab	
BIOL 428/428L	Virology and Virology Lab	
BIOL 438/438L	Immunology and Immunology Lab	
Organismal Biology and Ecology		
BIOL 325/325L	Environmental Ecology and Environmental Ecology Lab	
BIOL 333/333L	Ecology and Ecology Lab	
BIOL 345/345L	Marine Biology and Marine Biology Lab	
BIOL 352/352L	Oceanography and Oceanography Lab	
BIOL 361/361L	Microbiology and Microbiology Lab	
BIOL 437/437L	Herpetology and Herpetology Lab	
BIOL 452/452L	California Plant Communities and California Plant Communities Lab	
Functional Biology		
BIOL 341/341L	Comparative Anatomy and Comparative Anatomy Lab	
BIOL 342/342L	Developmental Biology and	
BIOL 343/343L	Invertebrate Zoology and Invertebrate Zoology Lab	
BIOL 350/350L	Introduction to Neuroscience and Neuroscience Lab	
BIOL 461/461L	Vertebrate Physiology and Vertebrate Physiology Lab	

Upper Division Biology Elective Credits (if needed)	0-6
Total Hours	40-41

¹ Students that successfully complete the Biology Department Honors Program are exempted from one of these four course requirements.

Required Supporting Courses

Select one of the following:		8-10
PHYS 201/201L/202/202L	Mechanics and Thermodynamics-Algebra and Mechanics and Thermodynamics-Algebra Lab and Electricity, Magnetism, and Optics - Algebra and Electricity, Magnetism, and Optics - Algebra Lab	
PHYS 211/211L/212/212L	Mechanics and Thermodynamics-Calculus and Mechanics and Thermodynamics-Calculus Lab and Electricity, Magnetism, and Optics - Calculus and Electricity, Magnetism, and Optics - Calculus Lab	
Select one of the following:		4
MATH 231 or MATH 251	Statistics for the Science (or Statistics course taught in a Math Department) Calculus I	
CHEM 151	General Chemistry	4
CHEM 151L	General Chemistry Lab	1
CHEM 152	General Chemistry II	4
CHEM 152L	General Chemistry II Lab	1
Select one of the following:		
CHEM 331/341	Organic Chemistry and Organic Chemistry Lab	
CHEM 201/201L	Elementary Organic Chemistry and Elementary Organic Chemistry Lab	
Total Hours		22-24

Minor in Biology

22 Credits minimum, 12 credits upper division.

Two Courses From:		6
BIOL 120	Introduction to Ecology and Populations	
BIOL 121	Introduction to Cells and Organisms	
BIOL 122	Introduction to Metabolism, Genes and Development	
BIOL 123L	Introduction to Biological Experimentation I	2
BIOL 124L	Introduction to Biological Experimentation II	2
Upper Division Biology Electives		12
Total Hours		22

The Biology Departmental Honors Program

Students with excellent academic credentials will be nominated by the Biology Department Faculty for Departmental Honors (Biol DH) in the Fall of their junior year. Students will be nominated based on Science GPA, Overall GPA, and demonstrated interest and aptitude for undergraduate research. Students who are not nominated may petition for admission to the Biol DH program by meeting with the Biology faculty in the Fall of their junior year.

Nominated/petitioned students who choose to participate in the Biol DH will enroll in a 2-unit Biology class, BIOL 399 Junior Honors, in the spring semester of their junior year. Students will then normally participate in the summer research on the proposed project between their junior and senior years. During the senior year, Biol DH students will enroll in BIOL 498 Senior Honors I - Capstone, during the Fall, and BIOL 499 Senior Honors II - Capstone in the Spring semester. Students who successfully complete these 8 units of coursework and present their work in a public setting will be awarded Departmental Honors in Biology.