

BIOLOGY

Biology is the study of life, its variety and processes. It emphasizes the relationship between structure and function in living systems and their interactions with the environment. The discipline is dynamic and rapidly advancing with the development of biotechnology and information technology. The major in biological sciences is designed for students who wish to enter graduate or health professional schools, the teacher credential program, or to seek careers in science education, business, industry or government. The minor will allow students in other majors to get a solid background in biology with further room to explore in-depth knowledge in a selected area. The Biology Program provides its students with a strong theoretical foundation in biology, combined with extensive, hands-on laboratory experiences using state-of-the-art technology. Students take a series of core courses augmented by upper-division electives selected from areas of special interest.

PROGRAMS OFFERED:

Bachelor of Science in Biology
 Bachelor of Science in Biology with an Emphasis in Cell and Molecular Biology
 Minor in Biology
 Certificate in Biotechnology

CONTACT INFORMATION:

Ching-Hua Wang, PhD, Professor of Biology
 Phone: (805) 437-8870
 Email: Ching-Hua.Wang@csuci.edu

REQUIREMENTS FOR THE BACHELOR OF SCIENCE DEGREE IN BIOLOGY (120 units):**LOWER DIVISION REQUIREMENTS (31 units):**

(12 units of the following will be counted toward lower division GE credits, 4 units in each of three different disciplines)

1. Biology	
BIOL 200	Principles of Organismal and Population Biology..... 4
BIOL 201	Principles of Cell and Molecular Biology 4
BIOL 202	Biostatistics 3
2. Mathematics	
MATH 150	Calculus I 4
3. Chemistry	
CHEM 121	General Chemistry I..... 4
CHEM 122	General Chemistry II..... 4
4. Physics	
PHYS 200	General Physics I 4
PHYS 201	General Physics II 4

For General Biology and Pre-Professional Students:**UPPER DIVISION REQUIREMENTS (32 units):**

1. Organic Chemistry	
CHEM 311 & 312	Organic Chemistry I..... 4
CHEM 314 & 315	Organic Chemistry II..... 4

(Organic Chemistry I & II taken at the 200 levels from community colleges are accepted as a year (8 units) of organic chemistry for the Biology major.)

2. Biology	
BIOL 300	Cell Physiology..... 4
BIOL 302	Genetics and Evolution..... 3
BIOL 330*	Ecology and the Environment..... 4
BIOL 346*	Scientific and Professional Ethics 3
BIOL 400	Molecular Biology and Molecular Genetics..... 4
3. Computing in Biology	
Select one of the following courses:	
BIOL 410	Computer Applications in Biomedical Fields..... 3
BIOL 430*	Research Design and Data Analysis 3
4. Service Learning	
A minimum of 2 units taken from the following:	
BIOL 494	Independent Research 2
BIOL 497	Directed Study 2
5. Capstone	
BIOL 499	Senior Capstone Colloquium 1

(Courses with * are double-counted toward UD GE credits.)

ELECTIVES IN BIOLOGY (15 UNITS):

A minimum of 15 units chosen from 300 to 400 level upper division biology courses, with at least one lab-based course and only one course that could be taken at 300 level (no courses from BIOL 331 to 333 would be counted toward the major). CHEM 318 or CHEM 400 could also be taken to satisfy the electives.

REQUIRED SUPPORTING AND OTHER GE COURSES**(42 units):**

ENGL 330	Writing in the Disciplines..... 3
American Institutions Requirement 6
Other GE Courses in Categories A-E 33

For Biology Students in Cell and Molecular Biology Emphasis:**UPPER DIVISION REQUIREMENTS (40-41 units):**

1. Organic Chemistry and Biochemistry (7 Units):	
CHEM 311	Organic Chemistry I..... 3
CHEM 312	Organic Chemistry I Laboratory..... 1
CHEM 318	Biological Chemistry 3

(Note: Students completing the following courses to satisfy this category will obtain a Minor in Chemistry in addition to a Major in Biology:

CHEM 311	Organic Chemistry I 3
CHEM 312	Organic Chemistry I Laboratory 1
CHEM 314	Organic Chemistry II..... 3
CHEM 315	Organic Chemistry II Laboratory 1
CHEM 400	Biochemistry..... 4

Organic Chemistry I & II taken at the 200 levels from community colleges are accepted as a year (8 units) of organic chemistry for the Biology major.)

2. Biology (27 Units):	
BIOL 300	Cell Physiology..... 4
BIOL 301	Microbiology..... 4
BIOL 302	Genetics and Evolution..... 3
BIOL 330*	Ecology and the Environment..... 4
BIOL 346*	Scientific and Professional Ethics 3
BIOL 400	Molecular Biology and Molecular Genetics 4
BIOL 401	Biotechnology and Recombinant DNA Technologies .. 5

3. Computing in Biology (3-4 Units)	
BIOL 430*	Research Design and Data Analysis 3
BIOL 431*	Bioinformatics..... 4
4. Service Learning (2 Units)	
BIOL 492	Biotech Internship.....2-3
BIOL 494	Independent Research 2
BIOL 497	Directed Study..... 2
5. Capstone (1 Unit):	
BIOL 499	Senior Capstone Colloquium 1

(Courses with * are double-counted toward UD GE credits.)

ELECTIVES IN BIOLOGY (10 UNITS):

A minimum of 10 units chosen from 400 level courses, excluding BIOL 410.

REQUIRED SUPPORTING AND OTHER GE COURSES

(38-39 units):

ENGL 330	Writing in the Disciplines.....3
American Institutions Requirement 6
Other GE Courses in Categories A-E.....	29-30

REQUIREMENTS FOR THE CERTIFICATE IN

BIOTECHNOLOGY (24-25 units):

(For students with a B.S. degree in biology pursuing a certificate in biotechnology)

1. B.S. degree in biology (may be concurrent);
2. Completion of the following courses with C or better grades:

CHEM 318 or 400	Biological Chemistry or Biochemistry I.....	3-4
BIOL 401	Biotechnology and Recombinant DNA Technology.....	5
BIOL 420	Cellular and Molecular Immunology.....	3
BIOL 431	Bioinformatics.....	4
3. Complete another 6 units of UD biology courses in consultation with the program director;
4. Complete a Biotech Internship course;
5. Complete the Capstone course;
6. Approval by the program director.

Note: This program had not received final approval at the time this catalog went to press. Please visit our Website at www.csuci.edu for confirmation of its approval.