Preparation

Up to five (5) units of chemistry credit can be applied toward a B.S. degree in Biochemistry at Cal State San Marcos for students who have successfully completed the Advanced Placement Test in chemistry with a score of 4 or 5. It is recommended that students with a score of 4 or 5 on the AP Test in chemistry consider auditing CHEM 150 during the fall semester in preparation for CHEM 160.

Special Conditions for the Bachelor of Science in Biochemistry

All courses counted toward the major, including Preparation for the Major courses, must be completed with a grade of C (2.0) or better. Transfer students must complete a minimum of 24 units counted toward the biochemistry major at CSUSM.

BACHELOR OF SCIENCE IN BIOCHEMISTRY

	Units
General Education*	51
Preparation for the Major*	47
Major Requirements+	34

The minimum number of units required for this degree is 120

**Nine (9) lower-division General Education units in area B are automatically satisfied by courses taken in Preparation for the Major.*

Preparation for the Major

Non-Biology/Chemistry Supporting Courses (17 units)

MATH 160**	5
MATH 162**	4
PHYS 201	4
PHYS 202	4

Lower-Division Biology/Chemistry Courses (30 units)

BIOL 210	4
BIOL 211**	4
CHEM 150** & 150L	5
CHEM 160	3
CHEM 201 & 202	6
CHEM 201L & 202L	4
CHEM 275	4

***Some courses supporting the preparation or electives in the major may satisfy the Mathematics and Science requirements of General Education. The courses fulfilling this double requirement are denoted by **.*

Major Requirements

Upper-Division Biology (4-5 units)

Choose one of the following

BIOL 351	5
BIOL 352	4
BIOL 353	4
BIOL 367	4

Upper-Division Chemistry (26 units)

CHEM 300	3
CHEM 351	3
CHEM 351L	2
CHEM 352	3
CHEM 401	3
CHEM 404	3
CHEM 404L	1
CHEM 416	5
CHEM 450	3

Upper-Division Science Elective (3-4 units)

CHEM 308	3
CHEM 398	1-2
CHEM 399	1-2
CHEM 402	3
CHEM 405	2
CHEM 455	3
CHEM 490	3
CHEM 491	3
CHEM 492	3
CHEM 493	3
CHEM 494	3
CHEM 498* or 499*	2
BIOT 355	4
BIOT 356	4
BIOL 368	3
BIOL 370	4
BIOL 374	3
BIOL 375	3
BIOL 476	3
BIOT 497	4

Or another science course with written approval from a Chemistry or Biochemistry faculty member.

**Course can be taken twice for a total of four (4) units.*

BIOLOGICAL SCIENCES

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Jeani Cressy
Tea McMillan
Scott Morgans
Christopher Ottersbach
Lizbeth Reyes
Courtney Nance-Sotelo
Phoi Tiet

Programs Offered:

- Bachelor of Science in Biological Sciences, Concentrations in:
  - Molecular and Cellular Biology
  - Ecology
  - Physiology
  - General Biology
- Minor in Biological Sciences
- Minor in Quantitative Biology and Biostatistics
- Bachelor of Science in Biotechnology*
- Master of Science in Biological Sciences

*See page 333 for Bachelor of Science in Biotechnology.

Biology is the study of living processes from the interaction of species with each other and their environment to the operant molecular mechanisms. The California State University San Marcos Biological Sciences Department presents a broad program of courses that deal with life on the ecosystem, population, organismal, and molecular levels. Life is a complicated series of chemical reactions and interactions, and we seek to understand the relationship of organisms to each other, to their environment, and within themselves in biochemical terms. Biological Sciences majors may choose between: 1) a general concentration, 2) a molecular and cellular biology 3) an ecology concentration and 4) a physiology concentration. The general concentration provides wide exposure to the range of biological sciences while the cell/molecular, ecology, and physiology concentrations offer majors the opportunity to focus their studies. With an appropriate choice of biological sciences electives and General Education electives, graduates can meet the requirements of admission to graduate, medical, dental, optometry, veterinary, and other professional schools.

Modern biological science has progressed from the purely analytical to now include manipulative capability. Recombinant DNA techniques enable the investigator to generate specified changes in components of organisms for the purpose of better understanding some process, and in some cases to introduce new traits that will be of practical usefulness to society. The Cal State San Marcos program in biological sciences exposes students to cloning techniques, illustrates the techniques involved as part of their general education, and trains them for research positions.

Society is the beneficiary of modern technology and is also at its mercy. Products of the industrial process and of our use of natural resources can perturb the dynamic balance in the environment, and by leading to the extinction of species, reduce the diversity of living forms. The Biological Sciences Department addresses fundamental problems in the ecological and environmental sciences.

The Biological Sciences Department has well-equipped, modern laboratories. The academic atmosphere is enriched by a close faculty/student interaction (reminiscent of prestigious, small liberal arts colleges), and by numerous field trips to research facilities and sites in the area. Students receive training that will enable them to gain rewarding employment in a number of areas, including teaching, research, the health sciences, biotechnology, ecology, and environmental science.