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## CHEMISTRY, BS, CERTIFIED BY THE AMERICAN CHEMICAL SOCIETY

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

Department of Chemistry and Biochemistry (https://catalog.csub.edu/general-information/csub-information/school-natural-sciences-mathematics-engineering/department-chemistry-biochemistry/)

Department Chair: Sarah Forester

Office: Science Building II, 273

Phone: (661) 654-2030

Email: chemistry@csub.edu

www.csub.edu/Chemistry (http://www.csub.edu/Chemistry/)

Program Maps for Natural Sciences, Mathematics, and Engineering (https://programmap.csub.edu/academics/interest-clusters/4e942a6e-b8e4-4b60-a1ae-334235acc581/)

#### **Program Description**

Modern chemistry occupies a central position among the sciences. The goal of chemical science is to discover the fundamental regularities by which matter in its multitude of aggregations interacts with energy in its many forms. Mathematical models and physical principles are utilized in the interpretation of chemical concepts. The organization of chemical knowledge leads to an understanding of natural phenomena in the real world of earth and life sciences.

Biochemistry is a continuously advancing field, vitally important to modern life sciences such as agriculture, biology, microbiology, medicine, pharmacy, and veterinary science. This field studies life in all biological systems, i.e., human, animal, plant, microorganisms, and viruses at the molecular level. Biochemistry is the discipline that explains the structures and the activities of living things at a sub-microscopic level combining principles of biology, chemistry, and physics. Biochemical understanding has served as the basis for major developments in health sciences related research, and significantly contributed to the formation of the biotechnology industry. The emerging knowledge has resulted in a revolution of our understanding of life forces and will have a continuously increasing impact on society.

The departmental academic program is designed to provide essential preparation for students to pursue professional careers and/or advanced studies in chemistry or related disciplines, such as Agricultural Chemistry, Biochemistry, Clinical Chemistry, Environmental Chemistry, and Forensics Chemistry. The department offers course work for chemistry majors to meet the requirements of medical and other professional schools in the health sciences, including dentistry, pharmacy, and veterinary medicine. It also cooperates with other departments and the School of Social Sciences and Education in developing a balanced program of academic and professional preparation for chemistry majors who seek teaching credentials.

### Teaching Credential: Science Teacher Preparation Program Leading to a Degree in Natural Sciences, Primary Concentration in Chemistry

The California Commission on Teacher Credentialing (CCTC) has authorized CSUB to offer a single subject matter preparation program in Natural Sciences leading to a Bachelor of Arts degree. This course work satisfies the subject matter requirements for a "Secondary Teaching Credential in Science." The program consists of three components: I. Primary Concentration (major); II. Secondary Concentration (minor); and III. Breadth (cognates). Program completion leads to a BA degree in Natural Sciences with a major in the area of primary concentration and a minor in the secondary concentration. Additional information may be obtained from the Chemistry Department office (661-654-2030).

For a detailed description of the course requirements, please turn to the Natural Sciences section in this catalog.

#### **General Chemistry and Transfer Students**

Students who have taken a full year of general chemistry and then transfer to CSUB will typically receive credit for CHEM 1000, 1001, 1100, and 1600. However, topics in CHEM 1100 and CHEM 1600 are covered in greater depth than in a typical general chemistry course and some students elect to take one or both courses even after completing general chemistry.

### **Academic Regulations**

A grade of "C" in chemistry, cognate, and all other major/minor courses is the minimal grade acceptable for progression into subsequent chemistry courses and for graduation. Students who fail to achieve at least a "C" may repeat the course. If a course is satisfactorily completed, the prior unsatisfactory grade will no longer bar a student from continuing in the Chemistry program. Credit, no-credit courses are not acceptable for the major or minor.

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Code	Title		Units		
General Education Requirements					
First-Year Seminar (FYS)					
Lower Division Area A: Foundational Skills					
Lower Divis	ion Area B: Natural	Sciences <sup>2</sup>	3		
Lower Divis	ion Area C: Arts and	d Humanities	6		
Lower Divis	ion Area D: Social a	nd Behavioral Sciences	3		
Lower Division (SELF) 6	ion Area E: Student	Enrichment and Lifelong Learning	0		
Lower Division Area F. Ethnic Studies					
American Institutions: Government and History					

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Cognates <sup>2</sup>	CHEM 4700	Special Topics in Chemistry				
	CHEM 4830	Instruction in Chemistry				
Mathematics <sup>4</sup>	Cognates <sup>2</sup>					
	Mathematics 4					

Select one of the following:		
MATH 2010 & MATH 2020	Calculus for the Biological and Chemical Scient	nces
	and Calculus for Biological & Chemical Science	es II
MATH 2310 & MATH 2320	Single Variable Calculus I for Engineers and Single Variable Calculus II for Engineers	
MATH 2510 & MATH 2520	Single Variable Calculus I and Single Variable Calculus II	
Physics <sup>5</sup>		
Select one of the following:		8
PHYS 2110 & PHYS 2120	College Physics I and College Physics II	
PHYS 2210 & PHYS 2220	Physics for Scientists and Engineers I and Physics for Scientists and Engineers II	
Major Subtotal		
Additional Units Needed Towards Graduation		
Total Units		117-120

- <sup>1</sup> The minimum GPA for these 77-78 units is 2.0 Satisfied in major or cognate
- <sup>3</sup> Satisfies Area B1

- Satisfies Area B1
   Satisfies Area B4
   Satisfies Area B1/B3
   The SELF requirement is met by completing a LD Area B, C, or D course with a S ELF component.
   Can be satisfied by exam.