

CHEMISTRY, BS, CONCENTRATION IN MANAGEMENT AND MARKETING

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/>)

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

Program Maps for Natural Sciences, Mathematics, and Engineering (<https://programmmap.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.

Program Requirements Academic Regulations

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| Code | Title | Units |
|---------------------------------------|---|-------|
| General Education Requirements | | |
| | First-Year Seminar (FYS) | 2 |
| | Lower Division Area A: Foundational Skills | 9 |
| | Lower Division Area B: Natural Sciences ⁵ | 3 |
| | Lower Division Area C: Arts and Humanities | 6 |
| | Lower Division Area D: Social and Behavioral Sciences | 3 |
| | Lower Division Area E: Student Enrichment and Lifelong Learning (SELF) ⁶ | 0 |

| | | | |
|--|-----------|--|----------------|
| Lower Division Area F: Ethnic Studies | 3 | Select one of the following focus areas (patterns are just suggestions): | 6 |
| American Institutions: Government and History | 6 | Management Focus | |
| Junior Year Diversity & Reflection (JYDR) | 3 | MGMT 3090 Career and Managerial Skills | |
| Graduation Writing Assessment Requirement (GWAR) ⁷ | 0 | MGMT 4300 Negotiation, ADR, and Conflict Management | |
| Upper Division Thematic Area C and D | 6 | Logistics/Operations Focus | |
| General Education Capstone ⁵ | 0 | MGMT 3020 Introduction to Operations Management | |
| <i>General Education Subtotal</i> | <i>41</i> | MKTG 4060 Marketing Channels | |
| Major Requirements | | Marketing/Sales Focus: | |
| <i>Lower Division</i> ¹ | | MKTG 3010 Consumer Behavior | |
| CHEM 1000 Foundations of Chemistry | 3 | MKTG 3020 Advertising & Public Relations | |
| CHEM 1001 Foundations of Chemistry Laboratory | 2 | <i>Major Subtotal</i> | <i>77</i> |
| CHEM 1100 Foundations of Analytical Chemistry | 2 | Additional Units Needed Towards Graduation | 1-2 |
| CHEM 1600 Foundations of Physical Chemistry | 2 | Total Units | 119-120 |
| CHEM 2110 Foundations of Quantitative Chemical Analysis | 3 | | |
| CHEM 2200 Foundations of Inorganic Chemistry | 2 | | |
| or CHEM 2240 Foundations of Bioinorganic Chemistry | | | |
| CHEM 2300 Foundations of Organic Chemistry | 3 | | |
| CHEM 2400 Foundations of Biochemistry | 2 | | |
| CHEM 2900 Research Methods in Chemistry ² | 2 | | |
| <i>Upper Division</i> ¹ | | | |
| CHEM 3110 Advanced Quantitative Chemical Analysis | 3 | | |
| CHEM 3300 Intermediate Organic Chemistry | 3 | | |
| CHEM 3301 Organic Chemistry Laboratory I | 2 | | |
| CHEM 3600 Physical Chemistry: Thermodynamics and Kinetics | 3 | | |
| CHEM 3610 Physical Chemistry: Quantum and Statistical Mechanics | 3 | | |
| CHEM 3908 Seminar in Chemical Literature | 3 | | |
| CHEM 4100 Chemical Separations | 1 | | |
| CHEM 4101 Chemical Separations Laboratory | 1 | | |
| CHEM 4200 Inorganic Chemistry | 3 | | |
| CHEM 4908 Senior Seminar in Chemistry | 3 | | |
| <i>Cognates</i> ¹ | | | |
| Mathematics ³ | | | |
| Select one of the following: | 8 | | |
| MATH 2010 Calculus for the Biological and Chemical Sciences & MATH 2020 I and Calculus for Biological & Chemical Sciences II | | | |
| MATH 2310 Single Variable Calculus I for Engineers & MATH 2320 and Single Variable Calculus II for Engineers | | | |
| MATH 2510 Single Variable Calculus I & MATH 2520 and Single Variable Calculus II | | | |
| Physics ⁴ | | | |
| Select one of the following: | 8 | | |
| PHYS 2110 College Physics I & PHYS 2120 and College Physics II | | | |
| PHYS 2210 Physics for Scientists and Engineers I & PHYS 2220 and Physics for Scientists and Engineers II | | | |
| Concentration in Management and Marketing | | | |
| MGMT 3000 Organizational Behavior | 3 | | |
| MGMT 3100 Human Resource Management | 3 | | |
| MKTG 3000 Marketing Principles | 3 | | |
| <i>Elective Courses</i> | | | |

¹ The minimum GPA for these 77-78 units is 2.0

² Satisfies Area B1

³ Satisfies Area B4

⁴ Satisfies Area B1/B3

⁵ Satisfied in major or cognate

⁶ The SELF requirement is met by completing a LD Area C, or D course with a SELF component.

⁷ Can be satisfied by exam.