BS Chemistry

Program Learning Objectives

1. Understand and apply the fundamental concepts of chemistry in the following areas: calculation and estimation, structure and properties of atoms, ions and molecules, chemical bonding and chemical reactivity.
2. Use techniques and modern tools to conduct, design, analyze, and interpret experiments in chemistry and biochemistry.
3. Communicate effectively with the scientific community.
4. Apply concepts of math, physical and biological sciences to chemical problems.
5. Integrate the concepts, skills and attitudes from a general education with his/her major program to understand and explain the impact of chemistry, science and technology on issues in global, economic, environmental, and societal contexts.

Degree Requirements and Curriculum

In addition to the program requirements on this page, students must also satisfy requirements outlined in more detail in the Minimum Requirements for Graduation section of this catalog, including:

- 60 units of upper division courses
- Graduation Writing Requirement (GWR)
- 2.0 GPA
- U.S. Cultural Pluralism (USCP)

Note: No major, support or concentration courses may be selected as credit/no credit.

MAJOR COURSES

CHEM 124 General Chemistry for Physical Science and Engineering I (B3 & B4) 1 4
CHEM 125 General Chemistry for Physical Science and Engineering II 4
CHEM 126 General Chemistry for Physical Science and Engineering III 4
CHEM 216 Organic Chemistry I 5
CHEM 217 Organic Chemistry II 3
CHEM 218 Organic Chemistry III 3
CHEM 221 Organic Chemistry Laboratory II 2
CHEM 324 Organic Chemistry Laboratory III 2
CHEM 331 Quantitative Analysis 2 5
CHEM 351 Physical Chemistry I 3
CHEM 352 Physical Chemistry II 3
CHEM 353 Physical Chemistry III 3
CHEM 354 Physical Chemistry Laboratory 2
CHEM 357 Physical Chemistry III Lab 1
CHEM 371 Biochemical Principles 5
CHEM 439 Instrumental Analysis 5

Select from the following: 3 2

CHEM 459 Undergraduate Seminar (2)
SCM 491 Science Student Teaching Workshop (1, 1)
CHEM 461 Senior Project Report 1
CHEM 481 Inorganic Chemistry 3
CHEM 484 Inorganic Chemistry Laboratory 2

Advanced Chemistry Electives

Select from the following Advanced Chemistry Electives (15 units) 15/18 or Polymers and Coatings Concentration (18 units) to complete major:

Advanced Chemistry Electives
BIO 308 Genetic Engineering Technology (Area F) 5
CHEM 349 Chemical and Biological Warfare
ENVE 324 Introduction to Air Pollution
SCM 335 Nuclear Science and Society
SCM 360 Selected Environmental Issues of California’s Central Coast

BIO/CHEM 441 Bioinformatics Applications
BIO/CHEM 475 Molecular Biology Laboratory
CHEM 252 Laboratory Glassblowing
CHEM 302 Marine Chemistry
CHEM 341 Environmental Chemistry: Water Pollution
CHEM 372 Metabolism
CHEM 373 Molecular Biology
CHEM 377 Chemistry of Drugs and Poisons
CHEM 400 Special Problems for Advanced Undergraduates 6
CHEM 401 Advanced Undergraduate Research 7
CHEM 405 Advanced Physical Chemistry
CHEM 414 Advanced Organic Chemistry - Mechanisms
CHEM 419 Bioorganic Chemistry
CHEM 420 Advanced Organic Chemistry - Synthesis
CHEM 444 Polymers & Coatings I
CHEM 445 Polymers & Coatings II
CHEM/MATE 446 Surface Chemistry of Materials
CHEM 447 Polymers and Coatings Laboratory I
CHEM 448 Polymers and Coatings Laboratory II
CHEM 449 Polymers and Coatings Internship
CHEM 450 Polymers and Coatings III
CHEM 451 Polymers and Coatings Laboratory III
CHEM 458 Instrumental Organic Qualitative Analysis
CHEM 463 Honors Research
CHEM 465 College Teaching Practicum
CHEM 466 Learning Assistant Seminar
CHEM 470 Selected Advanced Topics
CHEM 474 Protein Techniques Laboratory
CHEM 477 Biochemical Pharmacology
CHEM 478 Pharmaceutical Development
CHEM 485 Cooperative Education Experience 6
CHEM 495 Cooperative Education Experience 6
CHEM 528 Nutritional Biochemistry
SCM 302/ENGR 322 The Learn By Doing Lab Teaching Practicum
SCM 451 Ethics in the Sciences

SUPPORT COURSES

BIO 161 Introduction to Cell and Molecular Biology (B2 & B4) 1 4
MATH 141 Calculus I (B1) 1 4

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MATH 142  Calculus II (B1)  4
MATH 143  Calculus III  4
MATH 241  Calculus IV  4
Select from the following:  3-4
   CSC 232  Computer Programming for Scientists and Engineers
   CSC 234  C and Unix
   CSC 235  Fundamentals of Computer Science for Scientists and Engineers I
   MATH 206  Linear Algebra I
   MATH 244  Linear Analysis I
   STAT 218  Applied Statistics for the Life Sciences
   STAT 312  Statistical Methods for Engineers
   PHYS 132  General Physics II  4
   PHYS 133  General Physics III  4
   PHYS 141  General Physics I A  4
   Physics elective (200-level and above)  3
GENERAL EDUCATION (GE)
(See GE program requirements below.)  56
FREE ELECTIVES
Free Electives  5-9
Total units  180

1 Required in Major/Support; also satisfies GE.
2 Students should take CHEM 331 during their second year.
3 SCM 491 only for students pursuing Single-Subject Teaching Credential.
4 Consultation with advisor is recommended prior to selecting approved electives; bear in mind your selections may impact pursuit of post-baccalaureate studies and/or goals.
5 These courses also satisfy Area F requirements.
6 No more than 2 units may apply to approved advanced chemistry electives.
7 No more than 4 units may apply to approved advanced chemistry electives.

Concentration
Students may select the following concentration instead of advanced approved biochemistry electives in Major Courses

- Polymers and Coatings

General Education (GE) Requirements

- 72 units required, 16 of which are specified in Major and/or Support.
- See the complete GE course listing.
- Minimum of 12 units required at the 300 level.

Area A  Communication
   A1  Expository Writing  4
   A2  Oral Communication  4
   A3  Reasoning, Argumentation and Writing  4

Area B  Science and Mathematics

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