

PROGRAM MODIFICATION

PROGRAM AREA CHEMISTRY/ MULTIPLE PROGRAMS

Please use the following format to modify any existing program. Any deletions from an existing program need to be underlined (left hand column), and any additions/changes to the program need to be in CAPS (right hand column).

EXISTING PROGRAM

Name of Degree Program

Bachelor of Arts in Chemistry
Bachelor of Arts in Chemistry, Biochemistry
Option

Catalog Description of the Program

CHEMISTRY

The Chemistry Program at CSUCI is based on a “Big Ideas” approach to the discipline. The “Big Ideas” serve as core concepts to Chemistry and link the various sub-disciplines of Chemistry (Analytical, Inorganic, Organic, and Physical Chemistry and Biochemistry). Students will learn how to apply the “Big Ideas” skills to their analysis of concepts and problems. In addition to implementing the “Big Ideas” across the curriculum, students learn how to improve their analytical thinking, oral and written communication, and problem solving skills as individuals and in teams. The core of the Chemistry degree provides breadth across the sub-disciplines of Analytical, Inorganic, Organic, and Physical Chemistry. The culmination of the degree involves a capstone project, which requires a service learning, internship, or independent research experience.

Big Ideas in Chemistry:

- Geometric Structure
- Electronic Structure
- Forces between Molecules
- Thermodynamics
- Kinetics

PROPOSED PROGRAM

Name of Degree Program

Bachelor of Arts in Chemistry

Catalog Description of the Program

CHEMISTRY

PROGRAMS OFFERED

- Bachelor of Arts in Chemistry
- Bachelor of Science in Chemistry
- Bachelor of Science in Chemistry, Option in Biochemistry
- Minor in Chemistry
- Certificate in Chemistry

The Chemistry Program at CSUCI is based on a “Big Ideas” approach to the discipline. Students will learn how to apply the “Big Ideas” skills to their analysis of concepts and problems. In addition to implementing the “Big Ideas” across the curriculum, students learn how to improve their analytical thinking, oral and written communication, and problem solving skills as individuals and in teams. The required courses in Chemistry degree provide breadth across the sub-disciplines of Analytical, Inorganic, Organic, and Physical Chemistry. The culmination of the degree involves a capstone project in conjunction with a service learning project, internship, or independent research experience. Writing skills are developed in all upper-division Chemistry courses.

CAREERS

- Reactions

The BA in Chemistry requires 60 units of coursework in Chemistry and supporting disciplines, including an advanced writing course, and 14 units of Chemistry electives. The Biochemistry Option requires additional biology and biochemistry coursework in place of the 14 units of Chemistry electives, for a total of 70 units in the option. Graduates from the BA in Chemistry will receive an excellent preparation for securing entrance to a pre-professional program (i.e., pre-medical, pre-veterinary, pre-dentistry, or pre-pharmacy), to graduate school in Chemistry or Biochemistry, and for employment in the academic, private, or public sector as Chemists, Biochemists, Forensic Scientists, and Materials Scientists.

In addition to the BA in Chemistry, students may be interested in obtaining the minor in Applied Physics, minor in Biology, or double-majoring in Chemistry (Biochemistry Option and Biology). The Applied Physics minor can be obtained by taking PHYS 200 and 201 as part of the lower-division requirements in the BA in Chemistry and then complete 13 additional upper-division units in Applied Physics as specified in the Minor in Applied Physics through the 15-18 units of electives included in the BA in Chemistry. Students in the Biochemistry Option may obtain the minor in Biology by completing 6-9 units of Biology coursework including BIOL 302 (4 units) and 5 units of Biology electives (which may include CHEM/ BIOL 346 double-counted with the electives in the BA in Chemistry, Biochemistry Option). Students in the Bachelor of Science in Biology may elect to double major in the BS in Biology and the BA in Chemistry, Biochemistry Option, since 48-51 units of the BS in Biology coincide with the BA in Chemistry, Biochemistry Option; such a double-major will require students to exceed the 120 units for graduation.

Students who successfully graduate with the BA in Chemistry will be able to:

Graduates from the Bachelor of Arts or Bachelor of Science in Chemistry will receive an excellent preparation for securing entrance to a professional program (i.e., medical, veterinary, dentistry, or pharmacy), to graduate school in Chemistry or Biochemistry, and for employment in the academic, private, or public sector as chemists, biochemists, forensic scientists, and materials scientists.

The Bachelor of Arts in Chemistry is designed to provide a broad preparation in the Chemical Sciences and this degree is an excellent preparation for ~~pre-professional (premedical, pre-dental, pre-pharmacy, and pre-veterinary) careers~~ or graduate school in Chemistry. Required courses prepare students in four of the five traditional sub-disciplines of Chemistry: analytical, inorganic, organic, and physical chemistry. The Bachelor of Arts in Chemistry can serve as the depth of study necessary for securing a Single Subject Credential in Science for teaching at the high school and middle school level. Additional courses in geology, astronomy, and biology are recommended to meet the breadth requirements for this credential.

The Minor in Chemistry provides non-majors with the Chemistry background that is needed to pursue graduate study or a career in an interdisciplinary field. Students in professional programs (medical, dental, veterinary, pharmacy), or majoring in Biology or Environmental Science and Resource Management, in particular, should consider obtaining a Chemistry minor, since a significant portion of the coursework needed for the Chemistry minor is included in these programs.

The Certificate in Chemistry is designed to provide individuals who have already obtained a Bachelor of Arts or Bachelor of Science degree in another discipline with the opportunity to obtain a certificate for advanced Chemistry coursework that is equivalent to a minor in Chemistry.

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- Explain the “Big Ideas” of Chemistry and discriminate when they can be applied to problems in Chemistry.
- Evaluate and propose explanations for symbolic, microscopic, and macroscopic (real-life) representations of concepts including their relationship to the “Big Ideas” of Chemistry:
- Formulate hypotheses and devise and perform experiments to test a hypothesis as individuals and in a team.
- Explain key concepts in Chemistry effectively through oral and written communication.
- Interpret, evaluate and criticize the chemical literature.

DEGREES OFFERED

Bachelor of Arts in Chemistry
 Option in Biochemistry
 Minor in Chemistry
 Certificate in Chemistry

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**PROPOSED COURSE OF STUDY,
BACHELOR OF ARTS IN CHEMISTRY:**

FIRST YEAR (31 Units)

FALL (14 Units)

Composition and Rhetoric (ENGL 102 or ENGL 105); GE Category A-2 (3)
Critical Reasoning; GE Category A-3 (3)
CHEM 121 General Chemistry I; GE Category B-1 (4)
MATH 150 Calculus I; GE Category B-3 (4)

SPRING (17 Units)

University Elective or ENGL 103 (3)
CHEM 122 General Chemistry II (4)
MATH 151 Calculus II (4)
Foreign Language Requirement; GE Category C-3a (3)
University Elective (3)

SECOND YEAR (29 Units)

FALL (14 Units)

Oral Communication; GE Category A-1 (3)
CHEM 311 Organic Chemistry I (3)
CHEM 312 Organic Chemistry I Laboratory (1)
Social Science, General Education Requirement; GE Category D (3)
Physics requirement (PHYS 100 or 200); (4)

SPRING (15 Units)

CHEM 314 Organic Chemistry II (3)
CHEM 315 Organic Chemistry II Laboratory (1)
Social Science, General Education Requirement; GE Category D (3)
Physics requirement (PHYS 101 or 201); (4)
CHEM 305 Computer Applications in Chemistry; GE Category B-4 (1)
U.S. History; Title V (3)

THIRD YEAR (30 Units)

FALL (16 Units)

CHEM 250 Quantitative Analysis (2)
CHEM 251 Quantitative Analysis Laboratory (2)
Advanced Writing Requirement (ENGL 330, 483, or 484); (3)
Life Science, General Education Requirement; GE Category B-2 (3)*
Literature, General Education Requirement; GE Category C-2 (3)*
University Elective (3)

**REQUIREMENTS FOR THE
BACHELOR OF ARTS DEGREE IN
CHEMISTRY (120 UNITS)**

LOWER DIVISION REQUIREMENTS (28 UNITS)

1. CHEMISTRY

CHEM 121 General Chemistry I (4)
CHEM 122 General Chemistry II (4)
CHEM 250 Quantitative Analysis (2)
CHEM 251 Quantitative Analysis

Laboratory (2)

2. MATH

MATH 150 Calculus I (4)
MATH 151 Calculus II (4)

3. PHYSICS

PHYS 100 Introduction to Physics I

or

PHYS 200 General Physics I (4)
PHYS 101 Introduction to Physics II

or

PHYS 201 General Physics II (4)

UPPER DIVISION REQUIREMENTS (16 UNITS)

CHEM 305 Computer Applications in Chemistry (1)
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 371 PHYSICAL CHEMISTRY I (3)
CHEM 372 Physical Chemistry Laboratory (1)
CHEM 492 INTERNSHIP/ SERVICE LEARNING
OR CHEM 494 INDEPENDENT

SPRING (14 Units)
 CHEM 371 Physical Chemistry (3)
 CHEM 371 Physical Chemistry Laboratory (1)
 Human Physiological and Psychological
 Perspectives, General Education Requirement;
 GE Category E (3)*
 Multicultural General Education Requirement; GE
 Category C-3b (3)*
 Chemistry Elective, Laboratory (4)

FOURTH YEAR (32 - 33 Units)

FALL (16 Units)
 Chemistry Elective, Laboratory (4)
 Chemistry Elective, Lecture (3)
 Social Science, General Education Requirement;
 GE Category D (3)*
 Visual and Performing Arts, General Education
 Requirement; GE Category C-1 (3)*
 American Institutions Requirement; Title V (3)

SPRING (14 Units)
 Chemistry Elective, Lecture (*may include CHEM
 341 or 346 which satisfy GE Category D*); (3)
 Social Science, General Education Requirement;
 GE Category D (0-3; *may be satisfied with
 CHEM 341 or 346*)*
 University Elective, (3)
 University Elective, (3)
 University Elective, (0-3; *three-units of electives if
 CHEM 341 or 346 is used to meet Category
 D, otherwise, no elective units*)
 CHEM 499 Chemistry Colloquium (1)
Capstone Requirement (CHEM 492 or 494) (1)

Note to Students: To maximize University Electives, it is recommended that the nine units of upper-division, interdisciplinary general education courses (numbered 330-349 or 430-449) be taken from those courses marked with an asterisk (*), in order to meet simultaneously Categories A-E and the nine units of Upper-Division General Education. CHEM 341 or 346 will simultaneously meet three units of Chemistry Electives, three units of GE Category D, and three units of Upper-Division General Education. Students who transfer to CSU Channel Islands with General Education Certification may include up to six units of upper-division, interdisciplinary general education courses in the Bachelor of Arts in Chemistry by taking ENGL 330 for the advanced writing requirement, and either CHEM 341 or 346 as a Chemistry Elective.

RESEARCH (2)
 CHEM 499 Chemistry Capstone
 Colloquium (1)

(9 UNITS OF THE ABOVE COURSES WILL BE COUNTED TOWARD LOWER-DIVISION GENERAL EDUCATION CATEGORIES B1, B3, AND B4)

UPPER DIVISION CHEMISTRY ELECTIVES (11)

A total of 11 units of electives, including a minimum of two laboratory courses. Two units of Chemistry learning community courses (i.e., CHEM 123, 124, 313 and 316) and may be used as electives toward the degree.

CHEM 123 General Chemistry I Problem-Solving (1)
 CHEM 124 General Chemistry II Problem-Solving (1)
 CHEM 301 Environmental Chemistry (3)
 CHEM 313 Organic Chemistry I Learning Community (1)
 CHEM 316 Organic Chemistry II Learning Community (1)
 CHEM 326 Scientific and Professional Ethics (3)
 CHEM 341 Drug Discovery and Development (3)
 CHEM 410 Advanced Organic Synthesis (4)
 CHEM 415 Molecular Structure Determination (4)
 CHEM 450 Instrumental Analysis (4)
 CHEM 460 Biochemistry I (4)
 CHEM 461 Biochemistry II (4)
 CHEM 465 Bioinorganic Chemistry (3)
 CHEM 473 PHYSICAL CHEMISTRY II (3)
 CHEM 490 Special Topics in Chemistry (1-3)
 CHEM 492 Internship/ Service Learning (1-3)
 CHEM 494 Independent Research (1-3)
 CHEM 497 Directed Studies (1-3)

REQUIREMENTS FOR THE BACHELOR OF ARTS DEGREE IN CHEMISTRY:

Lower Division Required 28

Upper Division Required 18

Chemistry Elective Courses 14

Upper Division Required Interdisciplinary

General Education

- In Chemistry Major 0-3
- Outside of Chemistry Major 6-9

Other General Education (GE) 30

Title V 6

University Electives 15-18

Total

BACHELOR OF ARTS IN CHEMISTRY**LOWER DIVISION REQUIRED MAJOR COURSES (28 UNITS)**

CHEM 121 General Chemistry I (4 units)
CHEM 122 General Chemistry II (4 units)
CHEM 250 Quantitative Analysis (2 units)
CHEM 251 Quantitative Analysis Laboratory (2 units)
MATH 150 Calculus I (4 units)
MATH 151 Calculus II (4 units)
PHYS 100 Introduction to Physics I
or PHYS 200 General Physics I (4 units)
PHYS 101 Introduction to Physics II
or PHYS 201 General Physics II (4 units)

UPPER DIVISION REQUIRED MAJOR COURSES (18 UNITS)

CHEM 305 Computer Applications in Chemistry (1 unit)
CHEM 311 Organic Chemistry I (3 units)
CHEM 312 Organic Chemistry I Laboratory (1 unit)
CHEM 314 Organic Chemistry II (3 units)
CHEM 315 Organic Chemistry II Laboratory (1 unit)
CHEM 371 Physical Chemistry (3 units)

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Required Supporting and Other GE Courses (42 – 45 units)

American Institutions Requirement (6)

Other Courses in GE Categories A-E (36* – 39)

*Three units of General Education Category D may be included as Chemistry Electives (CHEM 326 or 341)

Electives in Any Discipline (20 – 23* units)**PROPOSED COURSE OF STUDY, BACHELOR OF ARTS IN CHEMISTRY:****FIRST YEAR (31 Units)****FALL (14 Units)**

Composition and Rhetoric (ENGL 102 or ENGL 105); GE Category A-2 (3)

Critical Reasoning; GE Category A-3 (3)

CHEM 121 General Chemistry I; GE Category B-1 (4)

MATH 150 Calculus I; GE Category B-3 (4)

SPRING (17 Units)

University Elective or ENGL 103 (3)

CHEM 122 General Chemistry II (4)

MATH 151 Calculus II (4)

Foreign Language Requirement; GE Category C-3a (3)

Oral Communication; GE Category A-1 (3)

SECOND YEAR (29 Units)**FALL (14 Units)**

American Institutions Requirement; Title V (3)

CHEM 311 Organic Chemistry I (3)

CHEM 312 Organic Chemistry I Laboratory (1)

Social Science, General Education Requirement; GE Category D (3)

Physics requirement (PHYS 100 or 200); (4)

CHEM 372 Physical Chemistry Laboratory
(1 unit)

CHEM 492 Internship/ Service Learning
or CHEM 494 Independent Research (1 unit)

CHEM 499 Capstone Project

ENGL 330 Writing in the Disciplines

Or ENGL 483 Technical Visual

Communication

Or ENGL 484 Technical Writing in the
Sciences (3 units)

SPRING (15 Units)

CHEM 314 Organic Chemistry II (3)

CHEM 315 Organic Chemistry II
Laboratory (1)

Social Science, General Education

Requirement; GE Category D (3)

Physics requirement (PHYS 101 or 201);
(4)

CHEM 305 Computer Applications in
Chemistry; GE Category B-4 (1)

U.S. History; Title V (3)

UPPER DIVISION CHEMISTRY THIRD YEAR (29 Units)
ELECTIVES (14 UNITS)

A total of 14 units of electives from the approved
list, including a minimum of two laboratory
courses, no more than 2 units of Chemistry
learning community courses (i.e., CHEM 313
and 316), and a maximum of three units of
CHEM 341 or 346.

TOTAL UNITS 60 UNITS

FALL (16 Units)

CHEM 250 Quantitative Analysis (2)

CHEM 251 Quantitative Analysis
Laboratory (2)

Multicultural General Education

Requirement; GE Category C-3b (3)*

Life Science, General Education

Requirement; GE Category B-2 (3)*

Literature, General Education

Requirement; GE Category C-2 (3)*

University Elective (3)

ELECTIVES IN CHEMISTRY

CHEM 301 Environmental Chemistry (3
units)

CHEM 313 Organic Chemistry I Learning
Community (1 unit)

CHEM 316 Organic Chemistry II Learning
Community (1 unit)

CHEM 341 Drug Discovery and Development
(3 units)

CHEM 346 Scientific and Professional Ethics
(3 units)

CHEM 410 Advanced Organic Synthesis (4
units)

CHEM 415 Molecular Structure
Determination (4 units)

CHEM 450 Instrumental Analysis (4 units)

CHEM 460 Biochemistry I (4 units)

CHEM 461 Biochemistry II (4 units)

CHEM 465 Bioinorganic Chemistry (3 units)

SPRING (13 Units)

CHEM 371 Physical Chemistry I (3)

CHEM 371 Physical Chemistry
Laboratory (1)

Human Physiological and Psychological

Perspectives, General Education

Requirement; GE Category E (3)*

University Elective (3)

University Elective (3)

FOURTH YEAR (31 Units)

FALL (16 Units)

Chemistry Elective, Laboratory (4)

Chemistry Elective, Lecture (*may include*
CHEM 326 or 341 which satisfy GE
Category D); (3)

Social Science, General Education
Requirement; GE Category D (3)*

CHEM 490 Special Topics in Chemistry (1-3 units)
CHEM 492 Internship/ Service Learning (1-3 units)
CHEM 494 Independent Research (1-3 units)
CHEM 497 Directed Studies (1-3 units)

**PROPOSED COURSE OF STUDY,
BACHELOR OF ARTS IN CHEMISTRY,
BIOCHEMISTRY OPTION:**

FIRST YEAR (28 Units)

FALL (14 Units)

Composition and Rhetoric (ENGL 102 or ENGL 105); GE Category A-2 (3)
Critical Reasoning; GE Category A-3 (3)
CHEM 121 General Chemistry I; GE Category B-1 (4)
MATH 150 Calculus I; GE Category B-3 (4)

SPRING (14 Units)

University Elective or ENGL 103 (3)
Oral Communication; GE Category A-1 (3)
CHEM 122 General Chemistry II (4)
MATH 151 Calculus II (4)

SECOND YEAR (31 Units)

FALL (15 Units)

CHEM 311 Organic Chemistry I (3)
CHEM 312 Organic Chemistry I Laboratory (1)
Physics requirement (PHYS 100 or 200); (4)
Foreign Language Requirement; GE Category C-3a (3)
BIOL 200 Principles of Organismal and Population Biology; GE Category B-2 (4)

SPRING (16 Units)

CHEM 314 Organic Chemistry II (3)
CHEM 315 Organic Chemistry II Laboratory (1)
CHEM 305 Computer Applications in

Visual and Performing Arts, General Education Requirement; GE Category C-1 (3)*
University Elective (3)

SPRING (15 Units)

Chemistry Elective, Laboratory (4)
Social Science, General Education Requirement; GE Category D (3) *OR* University Elective (3) *(if either CHEM 326 or 341 is taken as a Chemistry Elective)**
University Elective, (3)
University Elective, (2)
CHEM 492 INTERNSHIP/ SERVICE LEARNING OR 494 INDEPENDENT RESEARCH (2)
CHEM 499 Chemistry Capstone Colloquium (1)

Note to Students: To maximize University Electives, it is recommended that the nine units of upper-division, interdisciplinary general education courses (numbered 330-349 or 430-449) be taken from those courses marked with an asterisk (*), in order to meet simultaneously Categories A-E and the nine units of Upper-Division General Education.

REQUIREMENTS FOR THE MINOR IN CHEMISTRY (23 units)

Lower Division Requirements (8 units):

CHEM 121 General Chemistry I and Laboratory (4)
CHEM 122 General Chemistry II and Laboratory (4)

Upper Division Requirements (8 units):

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)

Electives (7 units):

A total of 7 units of electives on the 300-400 level or CHEM 250 and CHEM 251; a maximum of three units of an upper-division

Chemistry, General Education
Requirement; GE Category B-4 (1)
Physics requirement (PHYS 101 or 201)
(4)
BIOL 201 Principles of Cell and
Molecular Biology (4)
U.S. History; Title V (3)

THIRD YEAR (29 Units)

FALL (15 Units)

CHEM 250 Quantitative Analysis (2)
CHEM 251 Quantitative Analysis
Laboratory (2)
CHEM 460 Biochemistry I (4)
Advanced Writing Requirement (ENGL
330, 483, or 484) (3)
BIOL 300 Cell Physiology (4)

SPRING (14 Units)

CHEM 371 Physical Chemistry (3)
CHEM 371 Physical Chemistry
Laboratory (1)
CHEM 461 Biochemistry II (4)
Human Physiological and Psychological
Perspectives, General Education
Requirement; GE Category E (3)*
Social Science, General Education
Requirement; GE Category D (3)

FOURTH YEAR (32 Units)

FALL (16 Units)

BIOL 400 Molecular Biology and
Genetics (4)
Social Science, General Education
Requirement; GE Category D (3)*
Visual and Performing Arts, General
Education Requirement; GE Category C-1
(3)*
American Institutions Requirement; Title
V (3)
Literature, General Education
Requirement; GE Category C-2 (3)*

SPRING (16 Units)

CHEM 499 Chemistry Colloquium (1)
Capstone Requirement (CHEM 492 or

interdisciplinary General Education course
(CHEM 330-349 or CHEM 430-449) and/ or one
unit of a Learning Community course (CHEM
313 or 316) can be applied to the Chemistry
minor. Interdisciplinary General Education
courses that are cross-listed with Chemistry can
be counted toward the Chemistry minor.

REQUIREMENTS FOR THE CERTIFICATE IN CHEMISTRY (23 units)

Lower Division Requirements (8 units):

CHEM 121 General Chemistry I and Laboratory
(4)
CHEM 122 General Chemistry II and Laboratory
(4)

Upper Division Requirements (8 units):

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)

Electives (7 units):

A minimum of seven units of courses with the
CHEM prefix to include CHEM 250 and 251 or
other upper-division CHEM prefix courses, but
excluding upper-division general education
courses (CHEM 330-349 or 430-449). A
maximum of one unit of a Learning Community
course (CHEM 313 or 316) may be applied
toward the Certificate.

494) (1)

Social Science, General Education

Requirement; GE Category D (3)*

Social Science, General Education

Requirement; GE Category D (3)*

Multicultural General Education

Requirement; GE Category C-3b (3)*

University Elective (3)

University Elective (2)

Note to Students: To maximize University Electives, it is recommended that the nine units of upper-division, interdisciplinary general education courses (numbered 330-349 or 430-449) be taken from those courses marked with an asterisk (*), in order to meet simultaneously Categories A-E and the nine units of Upper-Division General Education. Students who transfer to CSU Channel Islands with General Education Certification may include up to three units of upper-division, interdisciplinary general education courses in the Bachelor of Arts in Chemistry, Biochemistry Option by taking ENGL 330 for the advanced writing requirement.

REQUIREMENTS FOR THE BACHELOR OF ARTS DEGREE IN CHEMISTRY, BIOCHEMISTRY OPTION

Lower Division Core Required 28

Upper Division Core Required 18

Required Option Courses 24

Upper Division Required Interdisciplinary General Education

- In Chemistry Major 0
- Outside of Chemistry Major 9

Other General Education (GE) 27

Title V 6

University Electives 8

Total 120

BACHELOR OF ARTS IN CHEMISTRY BIOCHEMISTRY OPTION

LOWER DIVISION REQUIRED MAJOR COURSES (36 UNITS)

CHEM 121 General Chemistry I (4 units)
CHEM 122 General Chemistry II (4
units)
CHEM 250 Quantitative Analysis (2
units)
CHEM 251 Quantitative Analysis
Laboratory (2 units)
MATH 150 Calculus I (4 units)
MATH 151 Calculus II (4 units)
PHYS 100 Introduction to Physics I
or PHYS 200 General Physics I (4 units)
PHYS 101 Introduction to Physics II
or PHYS 201 General Physics II (4 units)

UPPER DIVISION REQUIRED MAJOR
COURSES (18 UNITS)

CHEM 311 Organic Chemistry I (3 units)
CHEM 312 Organic Chemistry I Laboratory
(1 unit)
CHEM 314 Organic Chemistry II (3 units)
CHEM 315 Organic Chemistry II Laboratory
(1 unit)
CHEM 350 Physical Chemistry (3 units)
CHEM 372 Physical Chemistry Laboratory
(1 unit)
CHEM 492 Internship/ Service Learning
or CHEM 494
CHEM 499 Capstone Project (1 unit)
ENGL 330 Writing in the Disciplines
Or ENGL 483
Or ENGL 484

REQUIRED OPTION COURSES (24 UNITS)

BIOL 200 Principles of Organismal and
Population Biology (4 units)
BIOL 201 Principles of Cell and Molecular
Biology (4 units)
BIOL 300 Cell Physiology (4 units)
BIOL 400 Molecular Biology and Molecular
Genetics (4 units)
CHEM 460 Biochemistry I (4 units)
CHEM 461 Biochemistry II (4 units)

TOTAL UNITS 70 UNITS

REQUIREMENTS FOR THE MINOR IN CHEMISTRY (23 units)

The purpose of the Chemistry minor is to provide non-majors with the Chemistry background that is needed to pursue graduate study or a career in an interdisciplinary field. Students in pre-professional programs (pre-medical, pre-dental, pre-veterinary, pre-pharmacy), or majoring in Biology or Environmental Science and Resource Management, in particular, should consider obtaining a Chemistry minor, since a significant portion of the coursework needed for the Chemistry minor is included in these programs.

Lower Division Requirements (8 units):

CHEM 121 General Chemistry I and Laboratory (4)

CHEM 122 General Chemistry II and Laboratory (4)

Upper Division Requirements (8 units):

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)

Electives (7 units):

A total of 7 units of electives on the 300-400 level or CHEM 250 and CHEM 251; a maximum of three units of an upper-division interdisciplinary General Education course (CHEM 330-349 or CHEM 430-449) and/ or one unit of a Learning Community course (CHEM 313 or 316) can be applied to the Chemistry minor. Interdisciplinary General Education courses that are cross-listed with Chemistry can be counted toward the Chemistry minor.

REQUIREMENTS FOR THE CERTIFICATE IN CHEMISTRY (23 units)

The Certificate in Chemistry is designed to provide individuals who have already obtained a B.A. or B.S. degree in another discipline with the

opportunity to obtain a certificate for advanced Chemistry coursework that is equivalent to a minor in Chemistry. Individuals who have previously completed a year each of calculus and physics may consider completing an additional 21 units of coursework to obtain the Bachelor of Arts in Chemistry.

Lower Division Requirements (8 units):

CHEM 121 General Chemistry I and Laboratory
(4)

CHEM 122 General Chemistry II and Laboratory
(4)

Upper Division Requirements (8 units):

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)

Electives (7 units):

A minimum of seven units of courses with the CHEM prefix to include CHEM 250 and 251 or other upper-division CHEM prefix courses, but excluding upper-division general education courses (CHEM 330-349 or 430-449). A maximum of one unit of a Learning Community course (CHEM 313 or 316) may be applied toward the Certificate.

SUMMARY OF CHANGES

The following changes have been made to the Bachelor of Arts in Chemistry:

1. The Biochemistry Option has been deleted due to its significantly higher unit count and placed in the proposal for the Bachelor of Science in Chemistry
2. CHEM 371 has been renamed "Physical Chemistry I" and a new course, CHEM 373 Physical Chemistry II, has been added to the curriculum.
3. The Advanced Writing Course (ENGL 330, 483, or 484) has been deleted to reduce the number of units in the program. Writing across the Bachelor of Arts in Chemistry will be a feature of the degree program.
4. An additional unit of CHEM 492 or 494 has been added to the degree program for a total of two units of either CHEM 492 or 494.
5. The number of units of Electives has been reduced from 14 units to 11 units to reduce the number of units in the program.
6. The Catalog Description has been reformatted to reflect the organization of the current majors in the CSUCI catalog.

JUSTIFICATION

As originally designed, the Bachelor of Arts in Chemistry had 60 units of Chemistry and Supporting courses and the Biochemistry option had 70 units of these courses. With the introduction of both a Bachelor of Arts and Bachelor of Science in Chemistry, the Chemistry Program wishes to delete the Biochemistry Option and place this option in the proposed Bachelor of Science in Chemistry. In addition, the Chemistry Program decided to reduce the number of units in the Bachelor of Arts in Chemistry so that it would be consistent with other Bachelor of Arts programs in the area. By reducing the number of units for the Bachelor of Arts degree, it will become possible for students to obtain a minor in another discipline or double-major in Chemistry and Biology or Environmental Science and Resource Management (this would require a student to exceed 120 units toward graduation). A consultant strongly recommended that we add a second semester of Physical Chemistry as an elective course for students who were interested in going to graduate school in Chemistry. For this reason, we changed the title of CHEM 371 and added a new course, CHEM 373 Physical Chemistry II, to the curriculum.

In the process of reducing the number of units, the Chemistry Program decided to introduce writing across the curriculum instead of a formal Advanced Writing Course; for this reason, the Advanced Writing Course was deleted. With only one unit of research/ internship/ service learning required for graduation, this would not provide our students with sufficient experience. As a result, we increased the number of units to 2 units of research/ internship/ service learning.

Philip D. Hampton

October 4, 2004

Proposer of Program Modification

Date

Approvals

Program Chair Date

Curriculum Committee Chair Date

Dean Date

**California State University Channel Islands
Program Modification Consultation Sheet**

1. Program Title: Bachelor of Arts in Chemistry

2. Program Area: Chemistry/ Multiple Programs

Recommend Approval

Program Area/Unit	Program/Unit Chair	YES	NO (attach objections)	Date
Art				
Biology				
Business & Economics				
Education				
English				
History				
Liberal Studies				
Mathematics & CS				
Multiple Programs				
Psychology				
Library				
Information Technology				