

CALIFORNIA STATE UNIVERSITY CHANNEL ISLANDS

PROGRAM MODIFICATION

DATE: FEBRUARY 15, 2006

PROGRAM AREA CHEMISTRY

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

PROPOSED PROGRAM

Name of Degree Program

Bachelor of Arts in Chemistry
Bachelor of Science in Chemistry
Minor in Chemistry
Certificate in Chemistry

Name of Degree Program

Bachelor of Arts in Chemistry
Bachelor of Science in Chemistry
Minor in Chemistry
Certificate in Chemistry

Catalog Description of the Program

No Change to Introduction, Careers, and Additional Faculty

Catalog Description of the Program

FACULTY

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

**Lower Division Requirements (8 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)

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 Research (2)
CHEM 499 Chemistry 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, excluding courses numbered 330-349 (except CHEM 341) or 430-449, including a minimum of two laboratory courses. Two units of Chemistry learning community courses (i.e., CHEM 123, 124, 313 and 316) 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 373 Physical Chemistry II (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 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)

REQUIRED SUPPORTING AND OTHER GE COURSES (42 – 45 UNITS)

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 Research (2)
CHEM 499 Chemistry 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, excluding courses numbered 330-349 **AND** 430-449, including a minimum of two laboratory courses. Two units of Chemistry learning community courses (i.e., CHEM 313 and 316) may be used as electives toward the degree. **NO MORE THAN A COMBINED TOTAL OF 4 UNITS OF CHEM 492, 494, AND 497 MAY BE APPLIED AS ELECTIVES.**

CHEM 301 Environmental Chemistry (3)
CHEM 313 Organic Chemistry I Learning Community (1)
CHEM 316 Organic Chemistry II Learning Community (1)
CHEM 373 Physical Chemistry II (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 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)

REQUIRED SUPPORTING AND OTHER GE COURSES (45 UNITS)

American Institutions Requirement (6)
Other Courses in GE Categories A-E (39)

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)

SPRING (15 Units)

CHEM 314 Organic Chemistry II (3)
CHEM 315 Organic Chemistry II Laboratory (1)
CHEM 250 Quantitative Analysis (2)
CHEM 251 Quantitative Analysis Laboratory (2)
Physics requirement (PHYS 101 or 201); (4)
U.S. History; Title V (3)

THIRD YEAR (30 Units)

FALL (14 Units)

CHEM 305 Computer Applications in Chemistry; GE Category B-4 (1)
CHEM 371 Physical Chemistry I (3)
CHEM 371 Physical Chemistry Laboratory (1)
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)*

ELECTIVES IN ANY DISCIPLINE (20 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)

SPRING (15 Units)

CHEM 314 Organic Chemistry II (3)
CHEM 315 Organic Chemistry II Laboratory (1)
CHEM 250 Quantitative Analysis (2)
CHEM 251 Quantitative Analysis Laboratory (2)
Physics requirement (PHYS 101 or 201); (4)
U.S. History; Title V (3)

THIRD YEAR (30 Units)

FALL (14 Units)

CHEM 305 Computer Applications in Chemistry; GE Category B-4 (1)
CHEM 371 Physical Chemistry I (3)
CHEM 371 Physical Chemistry Laboratory (1)
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)*

SPRING (16 Units)

Chemistry Elective, Laboratory (4)
 Human Physiological and Psychological Perspectives,
 General Education Requirement; GE Category E (3)*
 University Elective (3)
 University Elective (3)
 Social Science, General Education Requirement; GE
 Category D (3)

FOURTH YEAR (30 Units)**FALL (15 Units)**

Chemistry Elective, Lecture (may include CHEM 326 or
 341 which satisfy GE Category D); (3)
 Social Science, General Education Requirement; GE
 Category D (3)*
 Visual and Performing Arts, General Education
 Requirement; GE Category C-1 (3)*
 University Elective (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 CHEM 494
 Independent Research (2)
 CHEM 499 Chemistry 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 BACHELOR OF SCIENCE 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

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SPRING (16 Units)

Chemistry Elective, Laboratory (4)
 Human Physiological and Psychological Perspectives,
 General Education Requirement; GE Category E (3)*
 University Elective (3)
 University Elective (3)
 Social Science, General Education Requirement; GE
 Category D (3)

FOURTH YEAR (30 Units)**FALL (15 Units)**

Chemistry Elective, Lecture (may include CHEM 326 or
 341 which satisfy GE Category D); (3)
 Social Science, General Education Requirement; GE
 Category D (3)*
 Visual and Performing Arts, General Education
 Requirement; GE Category C-1 (3)*
 University Elective (3)
 University Elective (3)

SPRING (15 Units)

Chemistry Elective, Laboratory (4)
 Social Science, General Education Requirement; GE
 Category D (3)*
 University Elective, (3)
 University Elective, (2)
 CHEM 492 Internship/ Service Learning or CHEM 494
 Independent Research (2)
 CHEM 499 Chemistry Colloquium (1)

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 BACHELOR OF SCIENCE 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 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 (20 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 460 Biochemistry I (4)
CHEM 492 Internship/ Service Learning
OR CHEM 494 Independent Research (2)
CHEM 499 Chemistry 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 (22)

A total of 22 units of electives, excluding courses numbered 330-349 (except CHEM 341) or 430-449, including a minimum of three laboratory courses. Two units of Chemistry learning community courses (i.e., CHEM 123, 124, 313 and 316) may be used as electives.

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 341 Drug Discovery and Development (3)
CHEM 346 Scientific and Professional Ethics (3)
CHEM 373 Physical Chemistry II (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 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)

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)

PHYS 200 General Physics I (4)
PHYS 101 Introduction to Physics II or
PHYS 201 General Physics II (4)

UPPER DIVISION REQUIREMENTS (20 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 460 Biochemistry I (4)
CHEM 492 Internship/ Service Learning
OR CHEM 494 Independent Research (2)
CHEM 499 Chemistry 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 (22)

A total of 22 units of electives, excluding courses numbered 330-349 AND 430-449, including a minimum of three laboratory courses. Two units of Chemistry learning community courses (i.e., CHEM 313 and 316) may be used as electives. **NO MORE THAN A COMBINED TOTAL OF 4 UNITS OF CHEM 492, 494, AND 497 MAY BE APPLIED AS ELECTIVES.**

CHEM 301 Environmental Chemistry (3)
CHEM 313 Organic Chemistry I Learning Community (1)
CHEM 316 Organic Chemistry II Learning Community (1)
CHEM 373 Physical Chemistry II (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 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)

REQUIRED SUPPORTING AND OTHER GE COURSES (45 UNITS)

American Institutions Requirement (6)
Other Courses in GE Categories A-E (39)

ELECTIVES IN ANY DISCIPLINE (5 units)

ELECTIVES IN ANY DISCIPLINE (5 – 8* units)

REQUIREMENTS FOR THE BACHELOR OF SCIENCE DEGREE IN CHEMISTRY, BIOCHEMISTRY OPTION (120 UNITS)

LOWER DIVISION REQUIREMENTS (36 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. BIOLOGY

BIOL 200 Principles of Organismal and Population Biology (4)
BIOL 201 Principles of Cell and Molecular Biology (4)

3. MATH

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

4. 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 (32 UNITS)

1. CHEMISTRY

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 460 Biochemistry I (4)
CHEM 461 Biochemistry II (4)
CHEM 492 Internship/ Service Learning **OR** CHEM 494
Independent Research (2)
CHEM 499 Chemistry Colloquium (1)

2. Biology

BIOL 300 Cell Physiology (4)
BIOL 400 Molecular Biology and Molecular Genetics (4)

(12 units of the above requirements will be counted toward lower-division General Education Categories B1, B2, B3, and B4)

UPPER DIVISION CHEMISTRY ELECTIVES (2)

A total of 2 units of electives, excluding courses numbered 330-349 or 430-449. Two units of Chemistry learning

REQUIREMENTS FOR THE BACHELOR OF SCIENCE DEGREE IN CHEMISTRY, BIOCHEMISTRY OPTION (120 UNITS)

LOWER DIVISION REQUIREMENTS (36 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. BIOLOGY

BIOL 200 Principles of Organismal and Population Biology (4)
BIOL 201 Principles of Cell and Molecular Biology (4)

3. MATH

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

4. 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 (32 UNITS)

1. CHEMISTRY

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 460 Biochemistry I (4)
CHEM 461 Biochemistry II (4)
CHEM 492 Internship/ Service Learning **OR** CHEM 494
Independent Research (2)
CHEM 499 Chemistry Colloquium (1)

2. Biology

BIOL 300 Cell Physiology (4)
BIOL 400 Molecular Biology and Molecular Genetics (4)

(12 units of the above requirements will be counted toward lower-division General Education Categories B1, B2, B3, and B4)

UPPER DIVISION CHEMISTRY ELECTIVES (2)

A total of 2 units of electives, excluding courses numbered 330-349 or 430-449. Two units of Chemistry learning community courses (i.e., 313 and 316) may be used as

community courses (i.e., CHEM 123, 124, 313 and 316) 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 341 Drug Discovery and Development (3)
CHEM 346 Scientific and Professional Ethics (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 373 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)

REQUIRED SUPPORTING AND OTHER GE COURSES (39 – 42 units)

American Institutions Requirement (6)
Other Courses in GE Categories A-E (33* – 36)

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

ELECTIVES IN ANY DISCIPLINE (5 – 8* units)

PROPOSED COURSE OF STUDY BACHELOR OF SCIENCE IN CHEMISTRY

FIRST YEAR (30 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 (16 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 (2)

SECOND YEAR (29 Units)

FALL (14 Units)

Oral Communication; GE Category A-1 (3)
CHEM 311 Organic Chemistry I (3)

electives toward the degree.

CHEM 301 Environmental Chemistry (3)
CHEM 313 Organic Chemistry I Learning Community (1)
CHEM 316 Organic Chemistry II Learning Community (1)
CHEM 373 Physical Chemistry II (3)
CHEM 410 Advanced Organic Synthesis (4)
CHEM 415 Molecular Structure Determination (4)
CHEM 450 Instrumental Analysis (4)
CHEM 465 Bioinorganic Chemistry (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)

REQUIRED SUPPORTING AND OTHER GE COURSES (42 units)

American Institutions Requirement (6)
Other Courses in GE Categories A-E (36)

ELECTIVES IN ANY DISCIPLINE (5 units)

PROPOSED COURSE OF STUDY BACHELOR OF SCIENCE IN CHEMISTRY

FIRST YEAR (30 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 (16 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 (2)

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)
CHEM 250 Quantitative Analysis (2)
CHEM 251 Quantitative Analysis Laboratory (2)
Physics requirement (PHYS 101 or 201); (4)
U.S. History; Title V (3)

THIRD YEAR (31 Units)

FALL (15 Units)

CHEM 371 Physical Chemistry I (3)
CHEM 372 Physical Chemistry Laboratory (1)
CHEM 460 Biochemistry I (3 4)
CHEM 305 Computer Applications in Chemistry; GE
Category B-4 (1)
Life Science, General Education Requirement; GE
Category B-2 (3)*
Social Science, General Education Requirement; GE
Category D (3)

SPRING (16 Units)

Chemistry Elective, Laboratory (4)
Chemistry Elective, Lecture (3)
Human Physiological and Psychological Perspectives,
General Education Requirement; GE Category E (3)*
Social Science, General Education Requirement; GE
Category D (3)*
Multicultural General Education Requirement; GE
Category C-3b (3)*

FOURTH YEAR (30 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 (if not satisfied with CHEM 326 or 341,
otherwise University Elective); (3)*
American Institutions Requirement; Title V (3)
Literature, General Education Requirement; GE Category
C-2 (3)*

SPRING (14 Units)

Visual and Performing Arts, General Education
Requirement; GE Category C-1 (3)*
Chemistry Elective, Laboratory (4)
Chemistry Elective, Lecture (3) AND Chemistry Elective
(1); OR Chemistry Elective, Laboratory (4)
CHEM 492 Internship/ Service Learning or CHEM 494
Independent Research (2)
CHEM 499 Chemistry Colloquium (1)

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)
CHEM 250 Quantitative Analysis (2)
CHEM 251 Quantitative Analysis Laboratory (2)
Physics requirement (PHYS 101 or 201); (4)
U.S. History; Title V (3)

THIRD YEAR (31 Units)

FALL (15 Units)

CHEM 371 Physical Chemistry I (3)
CHEM 372 Physical Chemistry Laboratory (1)
CHEM 460 Biochemistry I (3 4)
CHEM 305 Computer Applications in Chemistry; GE
Category B-4 (1)
Life Science, General Education Requirement; GE
Category B-2 (3)*
Social Science, General Education Requirement; GE
Category D (3)

SPRING (16 Units)

Chemistry Elective, Laboratory (4)
Chemistry Elective, Lecture (3)
Human Physiological and Psychological Perspectives,
General Education Requirement; GE Category E (3)*
Social Science, General Education Requirement; GE
Category D (3)*
Multicultural General Education Requirement; GE
Category C-3b (3)*

FOURTH YEAR (30 Units)

FALL (16 Units)

Chemistry Elective, Laboratory (4)
Chemistry Elective, Lecture (3)
Social Science, General Education Requirement; GE
Category D (3)*
American Institutions Requirement; Title V (3)
Literature, General Education Requirement; GE Category
C-2 (3)*

SPRING (14 Units)

Visual and Performing Arts, General Education
Requirement; GE Category C-1 (3)*
Chemistry Elective, Laboratory (4)
Chemistry Elective, Lecture (3) AND Chemistry Elective
(1); OR Chemistry Elective, Laboratory (4)
CHEM 492 Internship/ Service Learning or CHEM 494
Independent Research (2)
CHEM 499 Chemistry Colloquium (1)

To maximize University Electives, it is recommended that

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.

BACHELOR OF SCIENCE IN CHEMISTRY, BIOCHEMISTRY OPTION

FIRST YEAR (29 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 (15 Units)

University Elective or ENGL 103 (3)
BIOL 200 Principles of Organismal and Population
Biology; GE Category B-2 (4)
CHEM 122 General Chemistry II (4)
MATH 151 Calculus II (4)

SECOND YEAR (30 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 201 Principles of Cell and Molecular Biology (4)

SPRING (15 Units)

CHEM 314 Organic Chemistry II (3)
CHEM 315 Organic Chemistry II Laboratory (1)
Physics requirement (PHYS 101 or 201) (4)
CHEM 250 Quantitative Analysis (2)
CHEM 251 Quantitative Analysis Laboratory (2)
Oral Communication; GE Category A-1 (3)

THIRD YEAR (29 Units)

FALL (15 Units)

CHEM 371 Physical Chemistry I (3)
CHEM 372 Physical Chemistry Laboratory (1)
CHEM 305 Computer Applications in Chemistry, General
Education Requirement; GE Category B (1)
CHEM 460 Biochemistry I (4)
Social Science, General Education Requirement; GE
Category D (3)
U.S. History; Title V (3)

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.

BACHELOR OF SCIENCE IN CHEMISTRY, BIOCHEMISTRY OPTION

FIRST YEAR (29 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 (15 Units)

University Elective or ENGL 103 (3)
BIOL 200 Principles of Organismal and Population
Biology; GE Category B-2 (4)
CHEM 122 General Chemistry II (4)
MATH 151 Calculus II (4)

SECOND YEAR (30 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 201 Principles of Cell and Molecular Biology (4)

SPRING (15 Units)

CHEM 314 Organic Chemistry II (3)
CHEM 315 Organic Chemistry II Laboratory (1)
Physics requirement (PHYS 101 or 201) (4)
CHEM 250 Quantitative Analysis (2)
CHEM 251 Quantitative Analysis Laboratory (2)
Oral Communication; GE Category A-1 (3)

THIRD YEAR (29 Units)

FALL (15 Units)

CHEM 371 Physical Chemistry I (3)
CHEM 372 Physical Chemistry Laboratory (1)
CHEM 305 Computer Applications in Chemistry, General
Education Requirement; GE Category B (1)
CHEM 460 Biochemistry I (4)
Social Science, General Education Requirement; GE
Category D (3)
U.S. History; Title V (3)

SPRING (14 Units)

CHEM 461 Biochemistry II (4)
 BIOL 300 Cell Physiology (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 (15 Units)**

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

SPRING (17 Units)

CHEM 499 Chemistry Colloquium (1)
 CHEM 492 Internship/ Service Learning or
 CHEM 494 Independent Research (2)
 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 (2)
 Visual and Performing Arts, General Education
 Requirement; GE Category C-1 (3)*

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

SPRING (14 Units)

CHEM 461 Biochemistry II (4)
 BIOL 300 Cell Physiology (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 (15 Units)**

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

SPRING (17 Units)

CHEM 499 Chemistry Colloquium (1)
 CHEM 492 Internship/ Service Learning or
 CHEM 494 Independent Research (2)
 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 (2)
 Visual and Performing Arts, General Education
 Requirement; GE Category C-1 (3)*

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 COURSES WITH THE CHEM PREFIX AT THE 300-400 LEVEL (EXCLUDING

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)

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.

CHEM 330-349, CHEM 430-449, AND CHEM 490-499) OR CHEM 250 AND CHEM 251. One unit of a Learning Community course (CHEM 313 or 316) can be applied to 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 total of **7** units of courses with the CHEM prefix **ON THE 300-400 LEVEL (EXCLUDING CHEM 330-349, CHEM 430-449, AND CHEM 490-499) OR CHEM 250 AND CHEM 251.** 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 and Bachelor of Science in Chemistry:

- Deletion of CHEM 123, 124, 326, and 341 as potential electives in the major (these changes affected the Electives in the Major section and the Proposed Course of Study)
- A cap of 4 units (combined) of CHEM 492, 494, and 497 may be used as electives in the major. These units are in addition to the two units of CHEM 492, 494, or 497 that are required in both degree programs.

The following changes have been made to the Minor and Certificate in Chemistry:

- Deletion of interdisciplinary general education courses as potential electives in the major
- A cap of 3 units (combined) of CHEM 492, 494, and 497 may be used as electives in the minor and certificate.

JUSTIFICATION

The upper-division interdisciplinary courses in Chemistry have been designed for general education students and do not have sufficient upper-division content to warrant their inclusion as electives in the Chemistry major (BA, BS and BS with the Biochemistry Option). The Chemistry Program intends on deleting the cross-listing of BIOL 326/ MGT 326 as CHEM 326; as a result, this course no longer counts as an elective in the major.

Philip D. Hampton

November 7, 2005

Proposer of Program Modification

Date

