



SACRAMENTO
STATE

Program Proposal Form B



Academic Group (College): Natural Sciences & Mathematics	Date of Submission to College Dean:
Academic Organization (Department): Chemistry	Requested Effective: Fall 2009 Spring <u>X</u> , 2009 <u>2010</u>
Department Chair: Susan Crawford	Contact if not Department Chair: Mary McCarthy Hintz
Title of the Program: Bachelors Degree in Chemistry (Biochemistry Concentration)	
Type of Program Proposal:	
<input checked="" type="checkbox"/> Modification in Existing Program: <input checked="" type="checkbox"/> Substantive Change ___ Non-Substantive Change ___ Deletion of Existing Program ___ New Programs ___ Initiation (Projection) of New Program on to Master Plan ___ New Degree Programs ___ Regular Process ___ Fast Track Process ___ Pilot Process ___ New Minor, Concentration, Option, Specialization, Emphasis ___ New Certificate Program	
PLEASE NOTE: Form B is to be used only as a Cover Form. Additional information is requested for each of the above as noted in the corresponding procedure in the Policies and Procedures for Initiation, Modification, Review and Approval of Courses and Academic Programs found at http://www.csus.edu/acaf/univmanual/index.htm	
Briefly describe the program proposal (new or change) and provide a justification.	
<p>Currently, this degree requires BIO 10 (3 units) and 6 units of upper division courses in Biological Sciences (chosen from BIO 131, BIO 139, BIO 180, BIO 181, and BIO 184). Although the upper division biology courses have other prerequisites in addition to BIO 10, the Department of Biological Sciences had, in the past, agreed to waive all prerequisites except BIO 10 for students in this major. The proposed change to this major curriculum is mandated by the substantive course changes recently made by the Department of Biological Sciences. Biological Sciences recently instituted BIO 1 and BIO 2 for their majors, and made these the prerequisites for their upper division courses that apply to our major. Additionally, they changed BIO 10 so that it no longer is appropriate for science majors. They will no longer accept BIO 10 as a prerequisite for their upper division courses that apply to our major, and they will no longer waive additional prerequisites. We therefore are required to replace BIO 10 (3 units) with both BIO 1 (5 units) and BIO 2 (5 units) in our major. This change will increase the number of lower division units in this major from 39-43 to 46-50.</p> <p>Additionally, the Department of Biological Sciences has recently changed the units associated with BIO 184 from 3 to 4 units. This may affect some students in our major, but they can still incorporate BIO 184 in their 6 upper division Biological Sciences units.</p> <p>With this change, the BA in Chemistry (Biochemistry Concentration) will have a total of 71-77 units. With 51 units of required General Education courses, the total units needed to graduate with this major will be 122-128. However, 12 units of GE Area B overlap with courses required for the major.</p>	

Approvals:

Department Chair:

Susan M. Casford

Date:

4/21/09

College Dean:

David Heffner

Date:

5/1/09

University Committee:

Date:

**Associate Vice President and Dean
for Academic Affairs:**

Date:

8/27/07

NEW PROGRAM

A. Core Requirements (39- 43 units)

- (5) CHEM 1A*
- (5) CHEM 1B
- (3) CHEM 24
- (3) CHEM 25
- (4) CHEM 31
- (3) CHEM 124
- (4) MATH 30
- (4) MATH 31
- (8-12) PHYS 5A +PHYS 5B
OR
PHYS 11A + PHYS 11B + PHYS 11C

*Passing a placement exam or obtaining a passing grade of "C" or better in CHEM 4 is required to enroll in CHEM 1A.

Additional Requirements for Biochemistry Concentration

- (5) BIO 1
- (5) BIO 2
- (4-6) CHEM 142
OR
CHEM 140A + CHEM 140B
- (3) CHEM 160A
- (3) CHEM 160B
- (3) CHEM 162
- (3) CHEM 164

(6) Electives in Biological Sciences (must be from the following courses): BIO 121, BIO 131, BIO 139, BIO 180 and BIO 184.

Note: Students may also complete a BA with concentration in Biochemistry by taking the general BA curriculum and completing the following additional courses: CHEM 160A, CHEM 160B, CHEM 162, CHEM 164, BIO 1, BIO 2, and 6 units of upper division Biology courses from the approved list.

OLD PROGRAM

A. Core Requirements (39- 43 units)

- (5) CHEM 1A*
- (5) CHEM 1B
- (3) CHEM 24
- (3) CHEM 25
- (4) CHEM 31
- (3) CHEM 124
- (4) MATH 30
- (4) MATH 31
- (8-12) PHYS 5A + PHYS 5B
OR
PHYS 11A + PHYS 11B + PHYS 11C

*Passing a placement exam or obtaining a passing grade of "C" or better in CHEM 4 is required to enroll in CHEM 1A.

Additional Requirements for Biochemistry Concentration

- (3) BIO 10
- (4-6) CHEM 142
OR
CHEM 140A + CHEM 140B
- (3) CHEM 160A
- (3) CHEM 160B
- (3) CHEM 162
- (3) CHEM 164

(6) Electives in Biological Sciences (must be from the approved list and may be taken with only BIO 10 as a prerequisite): includes BIO 121, BIO 131, BIO 139, BIO 180 and BIO 184. The Biological Sciences Department has agreed to the waiver of prerequisites for electives.

Note: Students may also complete a BA with concentration in Biochemistry by taking the general BA curriculum and completing the following additional courses: CHEM 160A, CHEM 160B, CHEM 162, CHEM 164, BIO 10, and 6 units of upper division Biology courses from the approved list.

TEXT FOR CATALOG UPDATE

(Changes are marked in red.)

Requirements - Bachelor of Arts Degree

Units required for Major: 64 -77

Minimum total units required for the BA: 120

A minimum grade of "C-" is required in all courses applied to the Chemistry major. Grades below "C-" in prerequisite courses do not satisfy prerequisite requirements.

Courses in parentheses are prerequisites.

A. Core Requirements (39- 43 units)

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|--------|-----------------|--|
| (5) | <u>CHEM 1A*</u> | General Chemistry I (High school algebra [two years] and high school chemistry; or equivalent) |
| (5) | <u>CHEM 1B</u> | General Chemistry II (<u>CHEM 1A</u> with a passing grade of "C" or better) |
| (3) | <u>CHEM 24</u> | Organic Chemistry Lecture I (<u>CHEM 1B</u>) |
| (3) | <u>CHEM 25</u> | Organic Chemistry Lab (<u>CHEM 24</u> , <u>CHEM 124</u> , may be taken concurrently) |
| (4) | <u>CHEM 31</u> | Quantitative Analysis (<u>CHEM 1B</u>) |
| (3) | <u>CHEM 124</u> | Organic Chemistry Lecture II (<u>CHEM 24</u> , or instructor permission; concurrent enrollment in <u>CHEM 25</u> recommended) |
| (4) | <u>MATH 30</u> | Calculus I (<u>MATH 29</u> or four years of high school mathematics which includes two years of algebra, one year of geometry, and one year of mathematical analysis; completion of ELM requirement and Pre-Calculus diagnostic test) |
| (4) | <u>MATH 31</u> | Calculus II (<u>MATH 30</u> or appropriate high school based AP credit) |
| (8-12) | <u>PHYS 5A</u> | General Physics: Mechanics, Heat, Sound (Recently completed three years of high school algebra and geometry; and a college course in algebra and trigonometry) AND |
| | <u>PHYS 5B</u> | General Physics: Light, Electricity, and Magnetism, Modern Physics (<u>PHYS 5A</u> or instructor permission) OR |
| | <u>PHYS 11A</u> | General Physics: Mechanics (<u>MATH 30</u> , <u>MATH 31</u> ; or equivalent certificated high school courses. <u>MATH 31</u> may be taken concurrently) AND |
| | <u>PHYS 11B</u> | General Physics: Heat, Light, Sound (<u>MATH 31</u> , <u>PHYS 11A</u>) AND |
| | <u>PHYS 11C</u> | General Physics: Electricity and Magnetism, Modern Physics (<u>MATH 31</u> , <u>PHYS 11A</u>) |

*Passing a placement exam or obtaining a passing grade of "C" or better in CHEM 4 is required to enroll in CHEM 1A.

Additional Requirements for Concentration

B. Units required: 25-34

Students should choose one of the three following focuses with advice from their Department advisor. Units are in addition to the core requirements above.

No Concentration - General (25 units)

- (3) CHEM 140A Physical Chemistry Lecture I (CHEM 1B, CHEM 24, CHEM 31, MATH 32; PHYS 5A, PHYS 5B or PHYS 11A, PHYS 11B, PHYS 11C; PHYS 11C may be taken concurrently)
- (3) CHEM 140B Physical Chemistry Lecture II (CHEM 140A)
- (3) CHEM 141 Physical Chemistry Laboratory (CHEM 140A, CHEM 140B, or CHEM 142, instructor permission ENGL 20 or an equivalent second semester composition course; CHEM 140B may be taken concurrently)
- (4) MATH 32 Calculus III (MATH 31)

(12) Additional courses to a minimum of 24 upper division units in Chemistry, including two lecture courses and two laboratory courses. Elective courses should be selected in consultation with an adviser.

Biochemistry Concentration (32-34 units)

- (5) BIO 1 Biodiversity, Evolution and Ecology
- (5) BIO 2 Cells, Molecules and Genes (BIO 1, CHEM 1A)
- (4-6) CHEM 142 Introduction to Physical Chemistry (CHEM 1B, CHEM 24, PHYS 5A, PHYS 5B, MATH 31) OR
- CHEM 140A Physical Chemistry Lecture I (CHEM 1B, CHEM 24, CHEM 31, MATH 32; PHYS 5A, PHYS 5B or PHYS 11A, PHYS 11B, PHYS 11C; PHYS 11C may be taken concurrently) AND
- CHEM 140B Physical Chemistry Lecture II (CHEM 140A)
- (3) CHEM 160A Structure and Function of Biological Molecules (CHEM 124; MATH 26A or MATH 30 is recommended.)
- (3) CHEM 160B Metabolism and Regulation of Biological Systems (CHEM 160A)
- (3) CHEM 162 General Biochemistry Laboratory (CHEM 31; CHEM 160A or CHEM 161 either may be taken concurrently, ENGL 20 or an equivalent second semester composition course)
- (3) CHEM 164 Advanced Biochemistry Laboratory (CHEM 162 or equivalent, ENGL 20 or an equivalent second semester composition course)
- (6) Electives in Biological Sciences (must be from the following courses): BIO 121, BIO 131, BIO 139, BIO 180 and BIO 184.

Note: Students may also complete a BA with concentration in Biochemistry by taking the general BA curriculum and completing the following additional courses: CHEM 160A, CHEM 160B, CHEM 162, CHEM 164, BIO 1, BIO 2, and 6 units of upper division Biology courses from the approved list.

Forensic Chemistry Concentration (25-28 units)

- (3) CHEM 125 Advanced Organic Chemistry Laboratory (CHEM 25, CHEM 124, ENGL 20 or an equivalent second semester composition course)
- (4) CHEM 142 Introduction to Physical Chemistry (CHEM 1B, CHEM 24, PHYS 5A, PHYS 5B, MATH 31)

- (3) CHEM 161 General Biochemistry (CHEM 20 or CHEM 124)
- (3) CHEM 162 General Biochemistry Laboratory (CHEM 31; CHEM 160A or CHEM 161 either may be taken concurrently, ENGL 20 or an equivalent second semester composition course)
- (3) CRJ 1 Introduction to Criminal Justice and Society
- (3) CRJ 146 Introduction to Physical Evidence (CRJ 4)
- (6-9) A minimum of six units from the following:
- CHEM 110 Inorganic Chemistry Lecture (CHEM 125, CHEM 140B or CHEM 142 or instructor permission; CHEM 140B may be taken concurrently, however, students are encouraged to complete CHEM 140B and CHEM 141 first; Corequisite: CHEM 110L) AND
- CHEM 110L Advanced Inorganic Chemistry Laboratory (CHEM 125, ENGL 20 or an equivalent second semester composition course; Corequisite: CHEM 110)
- CHEM 133 Chemical Instrumentation (CHEM 31, CHEM 140B or CHEM 142, ENGL 20 or an equivalent second semester composition course)
- CHEM 141 Physical Chemistry Laboratory (CHEM 140A and CHEM 140B or CHEM 142, ENGL 20 or an equivalent second semester composition course; CHEM 140B may be taken concurrently)
- CHEM 164 Advanced Biochemistry Laboratory (CHEM 162 or equivalent, ENGL 20 or an equivalent second semester composition course)