

# MS IN CHEMISTRY (BIOCHEMISTRY)

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## In Workflow

1. CHEM Committee Chair (ghermanb@csus.edu)
2. CHEM Chair (rdixon@csus.edu)
3. NSM College Committee Chair (tsk@csus.edu)
4. NSM Dean (datwyler@csus.edu)
5. Academic Services (torsetj@csus.edu;%20212408496@csus.edu;%20cnewsome@skymail.csus.edu)
6. Senate Curriculum Subcommittee Chair (curriculum@csus.edu)
7. Dean of Undergraduate (james.german@csus.edu;%20celena.showers@csus.edu)
8. Dean of Graduate (cnewsome@skymail.csus.edu)
9. Catalog Editor (212408496@csus.edu;%20torsetj@csus.edu;%20cnewsome@skymail.csus.edu)
10. Graduate Studies (jdsmall@csus.edu)

## Approval Path

1. Thu, 03 Oct 2019 02:34:26 GMT  
Benjamin Gherman (ghermanb): Approved for CHEM Committee Chair
2. Fri, 04 Oct 2019 04:29:34 GMT  
Roy Dixon (rdixon): Approved for CHEM Chair
3. Mon, 21 Oct 2019 22:35:24 GMT  
Thomas Krabacher (tsk): Approved for NSM College Committee Chair
4. Wed, 23 Oct 2019 18:01:16 GMT  
Shannon Datwyler (datwyler): Approved for NSM Dean

## History

1. May 1, 2018 by clmig-jwehrheim

Date Submitted: Fri, 27 Sep 2019 18:13:36 GMT

## Viewing: MS in Chemistry (Biochemistry)

**Last approved: Tue, 01 May 2018 13:08:03 GMT**

**Last edit: Fri, 27 Sep 2019 18:13:34 GMT**

Changes proposed by: Benjamin Gherman (102085943)

### Academic Group: (College)

Natural Sciences & Mathematics

### Academic Organization: (Department)

Chemistry

### Catalog Year Effective:

2020-2021 Catalog

### Individual(s) primarily responsible for drafting the proposed degree major program:

Name (First Last)	Email	Phone 999-999-9999
Benjamin Gherman	ghermanb@csus.edu	916-278-6600

### Type of Program Proposal:

Major

### Program Change Type:

Non-Substantive

### Title of the Program:

MS in Chemistry (Biochemistry)

### Designation: (degree terminology)

Master of Science

**Briefly describe the program proposal (new or change) and provide a justification:**

Updating list of elective courses to include Chem 226, which itself was recently approved for the Spring 2019 catalog. Also updating elective courses to remove Chem 145 which is an undergraduate course and inappropriate for the Master's degree.

**Objectives of the degree program:**

To provide students with research experiences and advanced study in Chemistry (with Biochemistry concentration).

## University Learning Goals

**Graduate (Masters) Learning Goals:**

Critical thinking/analysis  
Communication  
Information literacy  
Disciplinary knowledge  
Professionalism  
Research (optional)

**Will this program be required as part of a teaching credential program, a single subject, or multiple subject waiver program (e.g., Liberal Studies, Biology) or other school personnel preparation program (e.g., School of Nursing)?**

No

**Catalog Description:**

**Total units required for MS: 30**

## Program Description

The graduate programs in the Department of Chemistry provide students with advanced study in synthesis, separation, and analysis of molecules with an emphasis on developing research skills in experimental and computational chemistry and in chemistry education. The graduate curriculum prepares students for careers in industry and teaching and for entry into PhD and professional programs.

**Admission Requirements: Course prerequisites and other criteria for admission of students to the degree major program, and for their continuation in it.**

## Admission Requirements

Admission as a classified graduate student in the Department of Chemistry requires:

- a BA degree in chemistry, biochemistry or its equivalent as determined by the graduate committee;
- a minimum 2.5 GPA overall, in the last 60 units, and in chemistry, biochemistry, math, and physics courses;
- two letters of recommendation from persons qualified to judge the applicant's potential for successful graduate study
- a personal statement describing the applicant's motivation for seeking a master's degree, why the Sacramento State Chemistry department was selected for pursuing this degree, and the area of advanced study within chemistry, biochemistry or education research the applicant plans to focus

Students desiring to apply to the chemistry graduate program should first examine the chemistry department's web page for basic requirements and deadlines and then contact the Chemistry department graduate coordinator or department Chair for further information if needed. International students should also contact the Office of Global Education for specific application requirements for international applicants.

## Admission Procedures

Students desiring to apply to the chemistry graduate program should first contact the Chemistry Department Graduate Coordinator or Department Chair. Information about the graduate program will be discussed with you.

In addition to a Departmental application, applicants must also complete a separate university application by the posted application deadline for the term applying. For more admissions information and application deadlines, please visit <http://www.csus.edu/gradstudies/>. The university application requires:

- an online application for admission; and
- two sets of **official** transcripts **from all colleges and universities attended**, other than Sacramento State.

Approximately six weeks after receipt of all items listed, an admission decision will be mailed to the applicant.

## Placement Examinations

All new graduate students must take two placement exams, in organic and physical chemistry, administered at the beginning of each semester. These exams cover topics commonly found in undergraduate courses. Exam results are used to determine undergraduate deficiencies in these areas of chemistry. All deficiencies must be removed by either taking and passing with a grade of "B" an appropriate undergraduate course or by taking again and passing the placement exam. A placement exam can be taken only twice; if the exam is not passed after the second attempt, the appropriate undergraduate course must be completed with a minimum grade of "B" in the first attempt.

## Course Requirements

The program centers on a core of four courses designed to increase a student's knowledge and skills in applications of analytical techniques, general instrumentation techniques, chemical separation techniques, and analysis of spectra with applications in the field of biochemistry and organic chemistry primarily. Electives are offered to permit students to expand further their knowledge and skills in chemistry. A minimum overall and semester GPA of 3.00 must be maintained to sustain good standing in the graduate program. A grade of "C" or better in individual courses is required for graded work to be credited toward fulfillment of the master's degree. Students not meeting these requirements are subject to probationary status and potential disqualification from the program. In addition, students must regularly attend seminars offered approximately once a week each semester. Each student will give one seminar during his/her tenure as a graduate student that is on a literature topic not related to his/her thesis topic and another on his/her thesis results. Participation in seminar expands a student's knowledge of current research in chemistry and also assists in developing his/her oral presentation skills.

## Thesis/Research

All students are required to complete a thesis involving original research. The research may be conducted on campus with a chemistry faculty member or at an employer's work site providing the work involves producing a new contribution to the field of chemistry. Research conducted at a work site requires a supervising chemistry faculty member. The work site mentor and project must be approved by the Graduate Committee.

## Advising

Following admission to the chemistry graduate program, students are advised by the graduate coordinator and by the faculty thesis supervisor. Students must consult with three faculty members before deciding on a thesis advisor. Students who are fully qualified upon admission and make the expected progress can normally finish the degree in two years

## Financial Aid

Financial aid is available. Please contact the Financial Aid Office for more information (1006 Lassen Hall, [www.csus.edu/faid](http://www.csus.edu/faid) (<http://www.csus.edu/faid/>)).

## Employment

Qualified graduate students may be hired for a limited number of positions as teaching associates (TA). TAs teach undergraduate chemistry laboratories and discussions. Eligibility requirements include: classified status, minimum cumulative GPA 3.0, good English communication skills, passing score on a general chemistry examination. Continuing students desiring support as a TA will be evaluated on the basis of past performance as a TA and academic record as a graduate student in the program. Contact the Department Chair for current employment information.

## Safety

Due to the potential hazards some chemicals may present, safety is an essential element of all Chemistry laboratory classes, including independent research. All students must adhere to the Department of Chemistry Laboratory Safety Policies (<http://www.csus.edu/chem/safety.html>). Failure to adhere to the Safety Policies may constitute grounds for withdrawal from a course and/or dismissal from the graduate program.

## Contact Lenses

Chemistry Department policy states that contact lenses are prohibited in all chemistry laboratories; prescription glasses should be worn instead. In addition, safety goggles are required in all laboratories. Laboratory aprons are recommended.

## Laboratory Fees

Students enrolling in chemistry laboratory courses or supervisory courses involving laboratory research are required to pay a laboratory fee for each course. In addition, if a student breaks an item in a laboratory, s/he is required to replace it or pay a breakage cost. An administrative hold is placed on a student's academic record if either is not paid. Details are given at the first class meeting.

## Repeating a Chemistry Course

Students repeating a chemistry course must repeat an equivalent course in both units and content.

## Minimum Units and Grade Requirement for the Degree

Units required for the MS: 30

Minimum Cumulative GPA: 3.0

## Advancement to Candidacy

After completing at least 40 percent of the graduate degree coursework with an overall GPA of 3.0 or higher, a student may submit an application for Advancement to Candidacy, which indicates the proposed program of graduate study is acceptable to the student, faculty advisor, thesis committee, and the Chemistry graduate coordinator. This procedure may begin as soon as the classified graduate student has:

- removed any deficiencies in admission requirements
- met English proficiency requirements
- completed at least 12 units of 200-level courses (including CHEM 200) with a minimum 3.0 GPA;
- obtained approval of the thesis project by the thesis advisor and thesis committee. Students obtain thesis project approval through submission of a formal thesis project proposal and an oral presentation of the project to the thesis committee.
- successfully completed a literature seminar presentation

As defined by policy <http://www.csus.edu/umannual/acadaff/fsm00010.htm>, a change in units constitutes a substantive change to the program. If your changes constitute a substantive change, please refer back to the "Program Change Type" field above to ensure that "Substantive" is selected.

**Program Requirements: (If new courses are being created as part of a new program, it will be useful to propose courses first.)**

## Program Requirements

Code	Title	Units
<b>Required Courses (11 Units)</b>		
CHEM 200	Research Methods in Chemistry	3
CHEM 260	Protein Biochemistry	3
CHEM 261	Nucleic Acid Chemistry	3
<i>Seminar in Chemistry - Semester 1</i>		
CHEM 294	Seminar In Chemistry	0.5
<i>Seminar in Chemistry - Semester 2</i>		
CHEM 294	Seminar In Chemistry	0.5
<i>Seminar in Chemistry - Semester 3</i>		
CHEM 294	Seminar In Chemistry	0.5
<i>Seminar in Chemistry - Semester 4</i>		
CHEM 294	Seminar In Chemistry	0.5
<b>Electives (15 Units)</b>		
Select 9 units from the following: <sup>1</sup>		9
CHEM 220	Spectrometric Identification of Compounds	
CHEM 226	Physical Organic Chemistry	3
CHEM 230	Separation Methods in Chemistry	
CHEM 245	Applications of Computational Chemistry	3
CHEM 250	Selected Topics in Chemistry	
CHEM 251	Topics in Interdisciplinary Chemistry	
CHEM 252	Topics in Synthetic Chemistry	
CHEM 253	Topics in Applied Chemistry	
CHEM 254	Topics in Physical Chemistry	
CHEM 255	Topics in Chemistry Education	
<b>Completion Requirements (10 Units)</b>		
CHEM 299	Special Problems	6
CHEM 500	Culminating Experience	4
Total Units		36

<sup>1</sup> Graduate or upper division courses in appropriate areas (BIO, GEOL, PHYS, ENVS) may be used upon graduate advisor and department chair. A maximum of 2 units of upper division undergraduate coursework may be used toward fulfilling electives.

**For graduate programs, the number of declared undergraduate major and the degree production over the preceding years of the corresponding baccalaureate program:**

n/a

## Fiscal Impact to Change an Existing Program

**Indicate programmatic or fiscal impact which this change will have on other academic units' programs, and describe the consultation that has occurred with affected units:**

None

**Provide a fiscal analysis of the proposed changes:**

None

**How will the above changes be accommodated within the department/College existing fiscal resources?**

None

**Will the proposed changes require additional resources?**

No

**What additional space, equipment, operating expenses, library, computer, or media resources, clerical/technical support, or other resources will be needed?**

None

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