

MASTER OF SCIENCE IN CHEMISTRY: CONCENTRATION IN BIOCHEMISTRY

Admission to Program

Students must meet these criteria:

- Satisfy the University's admission requirements.
- Have completed an undergraduate major in chemistry or biochemistry. If this criterion is not met, the student may be admitted, but additional coursework will be required.
- Have a GPA of at least 3.0 in chemistry and related courses.
- Report GRE scores of the general (not subject) exams.
- Applicants are required to fill out the department application form. Department application procedures are described at www.chembiochem.sfsu.edu/graduate_app_proc (http://www.chembiochem.sfsu.edu/forms/Chemistry_Grad_Application_Form_2009.doc).
- Submit three letters of recommendation from individuals familiar with previous academic work and/or potential for graduate work in chemistry. These letters should be sent to the graduate advisor, Department of Chemistry and Biochemistry.

Program Learning Outcomes

1. Demonstrate in-depth knowledge in a subdiscipline of chemistry.
2. Organize and communicate scientific information clearly and concisely, both verbally and in writing.
3. Use the scientific literature to develop and implement a research project.
4. Demonstrate independence in designing and conducting experiments, analyzing data and interpreting results.
5. Keep accurate records of experiments and data.
6. Demonstrate an ability to engage in collaborative scientific activities in research and coursework.

Written English Proficiency Requirement

Level One

Applicants are required to satisfy the entry-level written English proficiency requirement by a score of 4 or above on the GRE Analytical Writing section. Applicants who do not meet the GRE AWA score, but meet all other requirements, may be admitted on a conditional basis. The conditional status will be removed upon successful completion of a writing-based entrance exam. Admitted students who do not pass the writing-based entrance exam will take SCI 614 or an equivalent writing course by the end of the second semester.

Level Two

Students will demonstrate an advanced level of proficiency in written and spoken English by successfully completing CHEM 880, a thesis (CHEM 898) or written manuscript (CHEM 895), and an oral defense of the research project.

Advancement to Candidacy

To advance to candidacy, students must:

- Pass any three of the American Chemical Society (ACS) graduate entrance examinations: analytical, biochemistry, inorganic, organic, or physical chemistry. These examinations cover mainly undergraduate level material.
- Satisfy Level One of the written English proficiency requirement.
- Satisfy all course deficiencies stipulated upon entrance into the program.
- File an Advancement to Candidacy (ATC) form.

Note: After initiating a research project, a graduate student must enroll each semester in CHEM 897 while actively engaged in research for the M.S. degree. A maximum of 9 units of CHEM 897 may be included on the Advancement to Candidacy.

Chemistry (M.S.): Concentration Biochemistry – 30-33 units

Program (6 units)

Code	Title	Units
CHEM 879	Research Methods I	3
CHEM 880	Research Methods II	3

Research Requirements (9-12 units)

Research project in biochemistry, bioorganic, bioanalytical, biophysical, bioinorganic, biomedical, or biochemical education subdiscipline required.

Code	Title	Units
CHEM 897	Research	1-3

Culminating Experience (3 units)

One of the following Culminating Experience courses selected with prior consultation with the Culminating Experience committee:

Code	Title	Units
CHEM 898	Master's Thesis	3
or CHEM 895	Research Project	
Oral Defense of Culminating Experience		

Related Study (9-12 units)

Graduate courses in biochemistry, chemistry, physics, mathematics, or biology on advisement of a graduate major advisor. Upper-division courses may be used with permission of a graduate major advisor.

Code	Title	Units
Analytical/Environmental/Methods (AEM)		
CHEM 741	Electron Microscopy	4
CHEM 800	Special Topics in Chemistry (X-Ray Techniques)	3
CHEM 820	NMR Applications and Techniques	3
CHEM 821	Mass Spectrometry - Principles and Practice	3
Biochemistry (BIO)		
CHEM 800	Special Topics in Chemistry (Proteomics)	3
CHEM 800	Special Topics in Chemistry (Enzymology)	3
CHEM 841	Enzymology	3
CHEM 851	Biochemical Spectroscopy	3
Organic/Medicinal (OM)		
CHEM 800	Special Topics in Chemistry (Natural Products)	3

CHEM 800	Special Topics in Chemistry (Adv. Org. Chem. - Molec. Struct. & Reactivity)	3
CHEM 832	Organic Synthesis	3
CHEM 834	Organic Spectroscopic Methods	3
CHEM 842	Bioorganic and Medicinal Chemistry	3
Physical/Inorganic/Computational (PIC)		
CHEM 851	Biochemical Spectroscopy	3
CHEM 800	Special Topics in Chemistry	3
CHEM 852	Statistical Mechanics: Molecular Relaxation	3
CHEM 870	Computational Methods in Chemistry	3
Chemical Education		
CHEM 885	Teaching College Chemistry	3