

MASTER OF SCIENCE IN CHEMISTRY: CONCENTRATION IN BIOCHEMISTRY

Admission to Program

Students must meet these criteria:

- Satisfy the University's admission requirements.
- Have completed a BS or BA in chemistry, biochemistry, or a related field such as molecular biology, chemical engineering, materials science, or physics. Please note that some graduate courses assume the enrolled students have completed a year of physical chemistry and/or a semester of biochemistry. Additional coursework may be required for non-chemistry or biochemistry applicants.
- Have a GPA of at least 3.0 in chemistry and related courses.
- Applicants are required to fill out the department application form. Department application procedures are described at <https://chemistry.sfsu.edu/graduate> (<https://chemistry.sfsu.edu/graduate/>).
- 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 through CalApply.

Program Learning Outcomes

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

Written English Proficiency Requirement

Level One

The Level One writing requirement is satisfied by completing CHEM 879.

Level Two

The Level Two writing requirement is satisfied 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 in 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 | | |
| 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 |

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|---------------------------|------------------------------------|---|
| CHEM 852 | | |
| CHEM 870 | Computational Methods in Chemistry | 3 |
| Chemical Education | | |
| CHEM 885 | | |