

California State University, Fresno

College of Science and Mathematics

BS Biochemistry

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### Student Outcomes Assessment Plan (SOAP)

#### I. Mission Statement

The mission of the Department of Chemistry is to provide students with the appropriate level of modern and comprehensive chemical education required for life and work in our technologically advanced society. To accomplish this the department offers courses for students planning to be professional chemists, for students planning careers in the medical professions and careers in teaching, for students requiring a basic chemical science background for other majors, and for students fulfilling their general education science requirements.

The Bachelor of Science in Biochemistry is intended for students who plan to pursue a career in biochemical or chemical research, graduate study in biochemistry, or professional education in clinical health professions (e.g. medical, pharmaceutical, or dental).

#### II. Institutional Learning Outcomes, Program Learning Outcomes/Goals, and SLO's [a,b,c]

##### A. Institutional Learning Outcomes.

1. Developing Foundation, Broad, and Integrative Knowledge
2. Acquiring Specialized Knowledge
3. Improving Intellectual Skills
4. Applying Knowledge
5. Exemplifying Equity, Ethics, and Engagement

See <http://fresnostate.edu/academics/oie/assessment/fresno-state-assessment.html> for a full description of these Institutional Learning Outcomes.

##### B. Program Learning Outcomes

1. **Knowledge Base of Biochemistry** - Students will apply their understanding of chemical and biochemical terminology, concepts, theories, and skills to solve problems and evaluate the significance of data.

2. **Laboratory Work** - Students will apply their understanding of chemical and biochemical terminology, concepts, theories, and skills to conduct experimental laboratory work of high quality.
3. **Information Literacy** - Students will identify, find, and use chemical and biochemical information from reference materials and the peer-reviewed literature.
4. **Scientific Communication** - Students will clearly, effectively, and professionally communicate their scientific opinions, understanding and results in common written and oral formats.
5. **Teamwork** - Students will function effectively in collaborative and group work environments in lecture, study, and laboratory settings. This often includes the ability to work on a component of a larger project and connect their work with the results and work of other students and reports in the peer-reviewed literature.

### III. Curriculum Map [d]: Courses in which SLO's are addressed and evaluated

For courses in the major, the table below indicates which outcomes are introduced (I), which are developed (D), and which are mastered (M) in that course.

Course	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5
1A	I		I		
1AL	I	I	I		I
1B	D		I		
1BL	D	D	I	I	I
128A	D		I		
128B	D		I		
129A	D	D	I	I	D
129B	D	D	D	D	D
102	D	D	D	D	D
110A	D		D		
112	M		M		
155A	D		D		D
155B	M		M		M
156	M	M	M	M	M

### IV. SLO's Mapped to Assessment Measures and Methods [e]

Assessment Measure	Evaluation Method	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5
Biochemistry Exam	Score	X				
Laboratory Observation	Rubric		X			X
Written Report	Rubric	X		X	X	X

Assessment Measure	Evaluation Method	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5
Oral Presentations	Rubric				X	
Senior Survey	Score	X	X	X	X	X
Alumni Survey	Score	X	X	X	X	X

**V. Assessment Measures: Description of Assignment and Method (rubric, criteria, etc.) used to evaluate the assignment [f]**

- A. Direct Measures (Department/Program must use a minimum of three different direct measures)
1. Biochemistry Exam – This exam consists of validated multiple choice questions taken from biochemistry test banks. It is expected that students passing the course will score above 50% correct responses on the exam.
  2. Laboratory Observation – This evaluation will use a rubric to evaluate student performance in the laboratory based on classroom observations and review of the laboratory notebook.
  3. Written Laboratory Report – This evaluation will use a rubric to evaluate one or more elements of the written laboratory reports.
  4. Oral Presentation of Laboratory Results – This evaluation will use a rubric to evaluate one or more elements of oral scientific presentations.
- B. Indirect Measures
1. Senior Survey – An online survey administered each semester to students who have registered for graduation.
  2. Alumni Survey – An online survey administered to alumni who graduated at least one year previously.

**VI. Assessment Schedule/Timeline [g]**

Year	Measure	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5
23-24	Senior Survey Alumni Survey	X	X	X	X	X
24-25	Biochemistry Exam	X				
25-26	Laboratory Observation		X			X
26-27	Laboratory Report	X		X	X	X
27-28	Oral Presentation				X	
28-29	Senior Survey Alumni Survey	X	X	X	X	X
29-30	Biochemistry Exam	X				
30-31	Laboratory Observation		X			X

## VII. Closing the Loop [h,j,k]

**Fresno State Closing the Loop process is described immediately below.**

**A major assessment report, which focuses on assessment activities carried out the previous academic year, is submitted in September of each academic year and evaluated by the Learning Assessment Team and Director of Assessment at Fresno State.**

The Department Curriculum Committee is responsible for monitoring the undergraduate program, suggesting curriculum and other catalog changes, and reviewing changes proposed by others. This committee reviews the annual assessment report and suggests changes to the program as necessary. Assessment results and recommended changes are then reviewed by the entire faculty at a department faculty meeting or retreat. The faculty decides what changes to pursue and how to pursue them. The curriculum committee is responsible for following through on those changes.