Department of Chemistry and Biochemistry CSCI

CALIFORNIA STATE UNIVERSITY EAST BAY

ASSESSMENT PLAN: MS Chemistry

Date Updated: 07/31/2025

PROGRAM MISSION
CSUEB Missions, Commitments, and ILOs, 2012

PROGRAM LEARNING OUTCOMES (PLOs)	
Students graduating with a Chemistry M.S. from Cal State East Bay will be able to:	
PLO 1	Demonstrate mastery of specialized knowledge in the chemical sciences beyond the undergraduate level (ILO: Specialized Discipline)
PLO 2	Work effectively and safely in a laboratory environment using chemistry laboratory techniques and chemical/biochemical instrumentation (ILO: Specialized Discipline)
PLO 3	Use theoretical and experimental chemistry methods to test hypothesis or analyze and design solutions to problems (ILOs: Thinking and Reasoning, Specialized Discipline)
PLO 4	Research, understand, organize, and critically assess information from the chemical literature (ILOs: Communication, Specialized Discipline)
PLO 5	Present complex chemical information via oral and written reports. (ILOs: Communication, Specialized Discipline)

Year 1: 2024-2025	
1. Which PLO(s) to assess	PLO 1
2. Is it aligned to an ILO?	Yes
3. If yes, list ILO.	Demonstrate expertise and integration of ideas, methods, theory and practice in a specialized discipline of study.
4. Course name and number	Chem 631 (Graduate Organic Chemistry)
5. SLO from course	1. Predict the geometric structure, reactivity and other properties of organic molecules. 2. Predict the conformational preference of organic molecules and the stereochemical preference in reactions. 3. Describe different types of reactive intermediates and their importance in reactions. 4. Evaluate and apply different techniques for the determination of mechanisms of organic reactions. 5. Predict products or design syntheses of carbon-carbon bond formation reactions. 6. Determine structure of organic molecules through use of IR, NMR, and mass spectrometry.
6. Assessment activity	Embedded exam questions or Assignment
7. Assessment Instrument	Midterm and/or Final Exam and/or Assignment Based on a Rubric

8. *How data will be reported*	Quantitative: report percentage of students able to demonstrate mastery of the student learning outcomes.
9. *Responsible person(s)*	Instructor for Chem 631, Assessment Rep
10. *Time (which semester(s))*	Spring 2025
11. *Ways of closing the loop*	Internal assessment of results with planning to address shortcomings
Year 2: 2025-2026	
1. *Which PLO(s) to assess*	PLO 2
2. *Is it aligned to an ILO?*	Yes
3. *If yes, list ILO.*	Demonstrate expertise and integration of ideas, methods, theory and practice in a specialized discipline of study.
4. *Course name and number*	Chem 651 (Graduate Physical Chemistry)
5. *SLO from course*	1. Demonstrate and apply the mathematical models of quantum theory. 2. Formulate and apply quantum theory to model the behavior of atoms and molecules. 3. Utilize approximation techniques and assess their validity. 4. Develop the semi-classical theory of interaction between light and matter.
6. *Assessment activity*	Embedded Exam Questions or Computation Laboratory or Assignment
7. *Assessment Instrument*	Midterm and/or Final Exam or Computation Lab Activity or Assignment Based on a Rubric
8. *How data will be reported*	Quantitative: report percentage of students able to demonstrate mastery of the student learning outcomes.
9. *Responsible person(s)*	Instructors for Chem 651, Assessment Rep
10. *Time (which semester(s))*	Fall 2025
11. *Ways of closing the loop*	Internal assessment of results with planning to address shortcomings
Year 3: 2026-2027	
1. *Which PLO(s) to assess*	PLO 3
2. *Is it aligned to an ILO?*	Yes
3. *If yes, list ILO.*	Think critically and creatively and apply analytical and quantitative reasoning to address complex challenges and everyday problems. Demonstrate expertise and integration of ideas, methods, theory and practice in a specialized discipline of study.
4. *Course name and number*	Chem 641 (Graduate Biochemistry)
5. *SLO from course*	1. Demonstrate strong knowledge of biochemical fundamentals. 2. Identify the chemical principles underlying enzyme mechanisms. 3. Critically evaluate the role of redox chemistry, energy transfer, and bond formation in biochemical processes such as photosynthesis. 4. Compare and contrast the mechanisms of selected anabolic and catabolic pathways and their regulation. 5. Categorize and distinguish several types of DNA repair mechanisms.
6. *Assessment activity*	Embedded Exam Questions and/or Assignment
7. *Assessment Instrument*	Midterm and/or Final Exams and/or Assignment Based on a Rubric

8. How data will be reported	Quantitative: report percentage of students able to demonstrate mastery of the student learning outcomes.
9. Responsible person(s)	Instructors for Chem 641, Assessment Rep
10. Time (which semester(s))	Fall 2026
11. Ways of closing the loop	Internal assessment of results with planning to address shortcomings

Year 4: 2027-2028

1. Which PLO(s) to assess	PLO 4
2. Is it aligned to an ILO?	Yes
3. If yes, list ILO.	Communicate ideas, perspectives, and values clearly and persuasively while listening openly to others. Demonstrate expertise and integration of ideas, methods, theory and practice in a specialized discipline of study.
4. Course name and number	Chem 680 (Seminar)
5. SLO from course	1. Demonstrate understanding of information from the chemical literature. 2. Organize and critically assess information from the chemical literature. 3. Present complex chemical information via an oral seminar.
6. Assessment activity	Student Oral Presentation
7. Assessment Instrument	Presentation on Published Research Articles Based on a Rubric
8. How data will be reported	Quantitative, report to include proportion of students' mastery level based on the rubric
9. Responsible person(s)	Instructors for Chem 680, Assessment Rep
10. Time (which semester(s))	Fall 2027
11. Ways of closing the loop	Internal assessment of results with planning to address shortcomings

Year 5: 2028-2029

1. Which PLO(s) to assess	PLO 5
2. Is it aligned to an ILO?	Yes
3. If yes, list ILO.	Communicate ideas, perspectives, and values clearly and persuasively while listening openly to others. Demonstrate expertise and integration of ideas, methods, theory and practice in a specialized discipline of study
4. Course name and number	Chem 680 (Seminar)
5. SLO from course	1. Demonstrate understanding of information from the chemical literature. 2. Organize and critically assess information from the chemical literature. 3. Present complex chemical information via an oral seminar.
6. Assessment activity	Student Oral Presentation
7. Assessment Instrument	Presentation on Published Research Articles Based on a Rubric
8. How data will be reported	Quantitative, report to include proportion of students' mastery level based on the rubric
9. Responsible person(s)	Instructors for Chem 680, Assessment Rep
10. Time (which semester(s))	Fall 2028
11. Ways of closing the loop	Internal assessment of results with planning to address shortcomings