Department of Physics CSCI
CALIFORNIA STATE UNIVERSITY EAST BAY

ASSESSMENT PLAN: Bachelor of Science (BS)

Date Updated: 29 Sept 2023

PROGRAM MISSION

Institutional Learning Outcomes

PROGRAM LEARNING OUTCOMES (PLOs)

Students graduating with a BS in Physics will be able to:

PLO 1	**Fundamental Principles:** Describe the fundamental principles of physics and be able to apply these core ideas to analyze physical processes
PLO 2	**Solve Problems:** Use quantitative reasoning and critical thinking to solve complex problems, both theoretical and experimental in nature
PLO 3	**Technical skills:** Learn new technical subjects and skills
PLO 4	**Conduct and analyze experiments:** Construct, assess and troubleshoot experiments, quantitatively analyze the results using appropriate statistical procedures and tests of systematic errors, and draw meaningful conclusions
PLO 5	**Communication**: Effectively explain scientific ideas, both theoretical and experimental, to diverse audiences through written and oral presentations, both formal and informal
PLO 6	**Teamwork and collaboration**: Work professionally, effectively, and inclusively as a member of diverse collaborations to solve problems

Year 1: 2020-2021

1. *Which PLO(s) to assess*	PLO 4
2. *Is it aligned to an ILO?*	Yes
3. *If yes, list ILO.*	ILO 4 Specialized Discipline, particularly: Demonstrating fluency in the use of tools, technologies and methods in the field
4. *Course name and number*	Physics 381: Advanced Lab II
5. *SLO from course*	Design, construct, and troubleshoot experimental equipment; use appropriate statistical analysis methods to quantitatively compare experimental results to

	the physical model.
6. *Assessment activity*	Have students independently design an experiment to measure the acceleration of gravity, including statistical methods to assess the accuracy of experimental setup
7. *Assessment Instrument*	Rubric for scoring student experiment method and results
8. *How data will be reported*	Quantitative
9. *Responsible person(s)*	Dr. Amy Furniss and Dr. Kathryn Grimm (Department assessment coordinator and incoming coordinator)
10. *Time (which semester(s))*	Fall 2020
11. *Ways of closing the loop*	The quantitative scores from the lab on this activity will be included within the department annual report, and compared to methods and scores from previous years.
Year 2: 2021-2022	
1. *Which PLO(s) to assess*	PLO 5
2. *Is it aligned to an ILO?*	Yes
3. *If yes, list ILO.*	ILO 2: Communication
4. *Course name and number*	Phys 480: Advanced Lab III
5. *SLO from course*	Present a well-organized, quantitative argument in the form of a written report; present a clear, well-organized oral argument concerning their experiments to their peers.
6. *Assessment activity*	Written lab report and oral presentation of lab and results
7. *Assessment Instrument*	Department accepted standard rubric for grading group project oral presentation and written report
8. *How data will be reported*	Qualitative and quantitative
9. *Responsible person(s)*	Dr. Kathryn Grimm (Department assessment coordinator)
10. *Time (which semester(s))*	Fall 2021
11. *Ways of closing the loop*	This data will be reported within the assessment portion of the Physics Department annual report and compared to scores from this same course from previous years.
Year 3: 2022-2023	
1. *Which PLO(s) to assess*	PLO 3
2. *Is it aligned to an ILO?*	Yes
3. *If yes, list ILO.*	ILO 4 Specialized Discipline, particularly: Demonstrating fluency in the use of tools, technologies and methods in the field; assembling, arranging and formulating ideas, concepts, designs, or techniques and applying them to specific issues and problems.
4. *Course name and number*	Phys 381: Advanced Lab II
5. *SLO from course*	Modeling : students will be able to (a) quantitatively model the physical system under investigation; (b) model the measurement system and understand issues associated with precision and accuracy…; (c) use appropriate statistical analysis methods to quantitatively compare experimental results to the physical model. Technical skills: Use computational packages to make computational models and predictions as well as perform statistical analysis of data

4. Assessment activity	Grading of modules on each computational package; Grading of final project.
5. Assessment Instrument	Final project report and oral presentation are graded using department adopted rubric
6. How data will be reported	Quantitative. Reporting additional qualitative assessment will also be encouraged
7. Responsible person(s)	Dr. Kathryn Grimm (Department assessment coordinator)
8. Time (which semester(s))	Spring 2023
9. Ways of closing the loop	This data will be reported within the assessment portion of the Physics Department annual report and compared to scores from this same course from previous years.
Year 4: 2023-2024	
1. Which PLO(s) to assess	PLO 2
2. Is it aligned to an ILO?	Yes
3. If yes, list ILO.	ILO1 Thinking and Reasoning
4. Course name and number	PHYS 351: Quantum Mechanics II
5. SLO from course	Students will be able to use perturbation theory to calculate corrections to energies and eigenstates of various quantum systems.
6. Assessment activity	Specific problem set solved by students (same set each year)
7. Assessment Instrument	Rubric used to score problems
8. How data will be reported	Qualitative
9. Responsible person(s)	Dr. Kathryn Grimm (Department assessment coordinator)
10. Time (which semester(s))	Spring 2024
11. Ways of closing the loop	Qualitative results are included in assessment report for annual department report, comparing scores according to rubric.
Year 5: 2024-2025	
1. Which PLO(s) to assess	PLO1
2. Is it aligned to an ILO?	Yes
3. If yes, list ILO.	ILO 2 Communication
4. Course name and number	PHYS 451 Electromagnetism II
5. SLO from course	Students will be able to analyze problems and explain a variety of complex electromagnetic phenomena utilizing the fundamental equations known as Maxwell's Equations.
6. Assessment activity	National Electromagnetism Assessment Exam
7. Assessment Instrument	Grading of Assessment Exam and comparison to national averages
8. How data will be reported	Quantitative
9. Responsible person(s)	Dr. Kathryn Grimm (Department assessment coordinator)
10. Time (which semester(s))	Spring 2025
11. Ways of closing the loop	This data will be reported within the assessment portion of the Physics Department annual report and compared to scores from this same course from previous years and to the national averages.