Course Syllabus

Physics Laboratory

Instructor Information

- **Instructor:** Dr. Reza Monadi
- **Office:** 52, E-14
- **Email:** rmonadi@calpoly.edu

Course Materials

- **Textbook:** No formal textbook is required. Lab manuals will be posted weekly on Canvas under the Assignments tab.

Schedule of Experiments

Week	Experiment
1	Simple Pendulum
2	Thermodynamics and Thermometers
3	Specific Heat and Heats of Transformation
4	Buoyancy and Archimedes' Principle
5	Mass–Spring Oscillations
6	Vibrating Strings
7	Sound Resonance in Air Columns
8	Diffraction and Interference of Light
9	Reflection and Refraction of Light
10	Thin Lenses

Learning Outcomes

By the end of this course, students will be able to:

Experimental Design and Data Collection

- Set up and conduct experiments in oscillations, waves, optics, and thermodynamics
- Use measurement instruments to collect accurate and precise data

Data Analysis and Interpretation

- Apply statistical and graphical methods to analyze data
- Perform error analysis to assess reliability

Application of Physical Principles

- Connect hands-on experimentation with fundamental physics concepts
- Compare experimental results with theoretical predictions

Scientific Communication

- Write clear, concise, and well-structured lab reports
- Present results using tables, graphs, and equations

Critical Thinking and Problem Solving

- Identify sources of error and propose methods to reduce them
- Make reasonable approximations when analyzing systems

Collaboration and Independent Learning

- Work effectively in teams and engage in collaborative problem-solving
- Strengthen self-directed learning beyond the lab manual

Laboratory Equipment and Technology

- Develop proficiency with oscilloscopes, thermometers, and data acquisition systems
- Use computational tools for data analysis and visualization when applicable

Attendance Policy

Attendance is mandatory to receive credit. In case of emergencies, notify the instructor as soon as possible. Please arrive on time, as quizzes are administered at the beginning of each lab session.

Assessment

- **Lab Reports (70%):**
  - Data collection is performed collaboratively in groups
  - Each group must download the lab manual and prepare a lab report
  - Groups are assigned weekly; contact the instructor if you cannot locate your group
- **Quizzes (30%):**
  - Quizzes cover material from the previous week's experiment
  - Expect a mix of conceptual and analytical questions