Physics 142 Laboratory

Cal Poly Physics Department

Basic Information

Instructor: Dr. Reza Monadi
Office: 26M-109
Email: rmonadi@calpoly.edu
Lab Location: 80-269
Lab Time: Tuesday, 12:10 PM – 3:00 PM
Textbook: Lab manuals posted weekly on Canvas (Assignments tab)

Schedule

Week	Experiment
1	Simple Pendulum
2	Simple Harmonic Motion of a Spring
3	Vibrating Strings
4	Sound Resonance in Air Columns
5	Interference and Diffraction of Light
6	Refraction of Light
7	Simple Lenses
8	Temperature and Thermometers
9	Specific Heat and Heat of Transformation
10	Thermodynamic Cycles: Adiabatic Compression

Learning Outcomes

Experimental Design and Data Collection

- Develop proficiency in setting up and conducting experiments in oscillations, waves, optics, and thermodynamics
- Use appropriate measurement techniques and instruments for accurate data collection

Data Analysis and Interpretation

- Apply statistical and graphical methods to analyze data
- Use error analysis to assess reliability of results

Application of Physical Principles

- Demonstrate understanding of fundamental concepts through experimentation

- 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 suggest improvements
- Analyze physical systems using reasonable approximations

Collaborative and Independent Learning

- Work effectively in teams
- Develop self-directed learning skills beyond the lab manual

Laboratory Equipment and Technology

- Use laboratory instruments such as oscilloscopes and thermometers
- Apply computational tools for data analysis and visualization when appropriate

Class Attendance

Attendance is mandatory to receive credit. In case of an emergency, contact the instructor as soon as possible.

Assessment

- **Lab Reports:** Experiments are completed collaboratively. Reports are prepared individually using the provided Word-format lab manuals.
- **Quizzes:** Weekly quizzes cover material from the previous experiment and include conceptual and analytical questions.
- The lowest quiz score and the lowest lab report score will be dropped.

Grading

Component	Weight
Lab Reports	70%
Quizzes	30%
Total	100%