



## PHYS 1015

**Division:** Natural Science and Mathematics

**Department:** Physics

**Course:** PHYS 1015

**Title:** Elementary Physics Laboratory

**Catalog Description:**

PHYS 1015 is a laboratory course to accompany PHYS 1010. Students will learn techniques of measurement and data analysis. Principles from the lecture course will be demonstrated and tested.

**General Education Requirements:** N/A

**Semesters Offered:** Fall, Spring

**Credit/Time Requirement:** Credit: 1; Lecture: 0; Lab: 2

**Clock/Hour Requirements:** 0

**Offered for Non-Credit:** No

**Prerequisites:** N/A

**Corequisites:** Elementary Physics (PHYS 1010)

**Justification:**

This course is the counterpart to the lecture course, PHYS 1010. It is an essential step in the scientific method to test proposed theories in a laboratory setting. Hypothesis testing in a laboratory setting is an essential step in the scientific method.

**Student Learning Outcomes:**

Upon successful completion of this course, students will:

- understand and practice acceptable techniques of accurate measurement
- understand how uncertainty in measurements can propagate through a calculation
- use graphs to compare the results of an experiment with the predictions made by the theory
- be able to summarize the outcome of an experiment and determine if there is sufficient evidence to support the proposed theory or not.

**Content:**

This course will include:

- simple measurements to determine density
- forces as vectors
- acceleration of a freely falling body
- torques and equilibrium
- centripetal force
- velocity measurement using a ballistic pendulum

- specific heat and latent heat
- simple harmonic motion
- standing waves in pipes
- lenses and image formation
- electrical heating
- electrical circuits
- absorption of gamma rays.

### **General Education Outcomes:**

6) Apply computational skills to a variety of contexts.

Mathematical and computational skills are essential to the success of a physics laboratory student. The student must be able to perform calculations which predict the outcome of the given experiment, and then compare these predictions with the outcome.

7) Apply scientific reasoning to a variety of contexts.

Students must recognize how the theories presented in class apply to a given situation. They must be able to apply the theories and predict the outcome of a hypothetical experiment.

### **Key Performance Indicators:**

Students will be required to submit a report on the results of each weekly experiment. This report must contain recorded experimental measurements and observations. It must also show calculations based on measured values as components of theoretical formulas. The report must include the student's assessment as to whether the experimental results support the theory or not. Each student's laboratory report will be evaluated and graded by the instructor. Lab reports make up 100% percent of the grade for this course.

### **Representative Text and/or Supplies:**

A packet of lab exercises compiled by Snow College instructors.

**Optimum Class Size:** 24

**Maximum Class Size:** 30

**Signatures:**

I hereby submit this course syllabus:

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Ted Olson, , Professor

I hereby find this course consistent with the goals and resources of the Physics Department:

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Ted Olson, , Professor, Chair

I hereby find this course consistent with the goals and resources of the Natural Science and Mathematics Division:

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Dan Black, EdD, Associate Professor, Dean

I have discussed the need for library resources related to this class with the person submitting the syllabus:

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Lynn Anderson, MLIS, Technical Services Librarian (Main Campus)

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Michelle Olsen, MLS, Campus Librarian (Richfield Campus)