

**STATE UNIVERSITY OF NEW YORK
COLLEGE OF TECHNOLOGY
CANTON, NEW YORK**



MASTER SYLLABUS

PHYS 125 – PHYSICS LABORATORY I

CIP Code: 40.0801

Created by: Dr. Feng Hong

Updated by: Dr. Lawretta Ononye

Canino School of Engineering Technology

Physics

Fall 2023

- A. **TITLE:** Physics Laboratory I
- B. **COURSE NUMBER:** PHYS 125
- C. **CREDIT HOURS:** (Hours of Lecture, Laboratory, Recitation, Tutorial, Activity)
- # Credit Hours: 1
 # Lecture Hours:
 # Lab Hours: 2 per week
 Other: per week
 Course Length: 15 Weeks
- D. **WRITING INTENSIVE COURSE:** Yes
- E. **GER CATEGORY:** GER 2 Natural Sciences
 Does course satisfy more than one GER category? If so, which one?
- F. **SEMESTER(S) OFFERED:** (*Fall, Spring, or Fall and Spring*) **Fall and Spring**

G. **COURSE DESCRIPTION:**

Physics Laboratory I is a laboratory course to accompany PHYS 121 (College Physics I). Students will have laboratory experiments concerning one and two dimensional translational mechanics and graphical analysis.

H. **PRE-REQUISITES:** None

CO-REQUISITES:
 PHYS 121 or permission of instructor

I. **STUDENT LEARNING OUTCOMES:**

<u>Course Student Learning Outcome [SLO]</u>	<u>PSLO</u>	<u>GER</u>	<u>ISLO</u>
a. Understanding of the methods scientists use to explore natural phenomena, including observation, hypothesis development, measurement, and data collection, experimentation, evaluation of evidence, and employment of mathematical analysis	N/A	Understanding of the methods scientists use to explore natural phenomena, including observation, hypothesis development, measurement and data collection, experimentation, evaluation of evidence, and employment of mathematical analysis	1-Comm Skills 2-Crit Think 4-Soc Respons
b. Application of scientific data, concepts, and models in physics	N/A	Application of scientific data, concepts, and models in one of the natural sciences	1-Comm Skills 2-Crit Think

c. Use computer assisted data collection and analysis.	N/A	Application of scientific data, concepts, and models in one of the natural sciences	1-Comm Skills 2-Crit Think

KEY	<u>Institutional Student Learning Outcomes</u> <u>[ISLO 1 – 5]</u>
ISLO #	ISLO & Subsets
1	Communication Skills Oral [O], Written [W]
2	Critical Thinking <i>Critical Analysis [CA], Inquiry & Analysis [IA], Problem Solving [PS]</i>
3	Foundational Skills <i>Information Management [IM], Quantitative Lit./Reasoning [QTR]</i>
4	Social Responsibility <i>Ethical Reasoning [ER], Global Learning [GL], Intercultural Knowledge [IK], Teamwork [T]</i>
5	Industry, Professional, Discipline Specific Knowledge and Skills

J. **APPLIED LEARNING COMPONENT:** Yes No

If YES, select one or more of the following categories:

- | | |
|---|--|
| <input checked="" type="checkbox"/> Classroom/Lab | <input type="checkbox"/> Civic Engagement |
| <input type="checkbox"/> Internship | <input type="checkbox"/> Creative Works/Senior Project |
| <input type="checkbox"/> Clinical Placement | <input type="checkbox"/> Research |
| <input type="checkbox"/> Practicum | <input type="checkbox"/> Entrepreneurship |
| <input type="checkbox"/> Service Learning | (program, class, project) |
| <input type="checkbox"/> Community Service | |

K. **TEXTS:**N/A

L. **REFERENCES:** None

M. **EQUIPMENT:** Existing physics laboratory equipment will be used.

N. **GRADING METHOD:** A-F

O. **SUGGESTED MEASUREMENT CRITERIA/METHODS:**

- Lab reports
- Projects
- Participation

P. **DETAILED COURSE OUTLINE:** N/A

Q. **LABORATORY OUTLINE:**

I. **Graph Plotting and Graphical Analysis**

Prepared data will be plotted by hand. The same data is then plotted using computer software.

II. **Graphical Analysis**

Additional graphical analysis will be done with the aid of computers.

III. **Tools for Scientific Thinking - Investigations #1, 2, 3**

Sonar will be used to relate position and motion with computer generated graphs.

IV. **Force Table**

Analytical and graphical solutions to vector addition of equilibrium forces will be checked out on a force table.

V. **Tools for Scientific Thinking - Investigation #4**

Sonar will be used to investigate velocity.

VI. **Tools for Scientific Thinking - Investigations# 5, 6**

Sonar will be used to investigate acceleration.

VII. Acceleration of Gravity

The acceleration of free falling objects will be determined.

VIII. Forces and Motion

The acceleration of carts along a track and experiencing a constant force is measured.

IX. Plotting Data - The Spring

The behavior of loaded springs is studied.

X. Measurement and Significant Figures

Areas, volumes and time are measured with attention to accuracy and precision.

XI. Projectile Motion

Small plastic balls are fired from a spring gun. Calculated and measured ranges are compared.

XII Work and Energy

Students will determine the work done on a (nearly) frictionless cart and show that the work done is equal to the increase in kinetic energy of the cart.

Furthermore, they will show that the increase in energy of the cart is equal to the decrease in potential energy of the falling weight that supplies the force on the.