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

MASTER SYLLABUS

COURSE NUMBER – COURSE NAME
PHYS 126 - PHYSICS LABORATARY II

Created by: Feng Hong

Updated by: Feng Hong

Canino School of Engineering Technology !

Department: PHYSICS !

Semester/Year: FALL/2018 !

A. **TITLE**: Physics Laboratory II

B. **COURSE NUMBER:** PHYS 126

C. **CREDIT HOURS: (Hours of Lecture, Laboratory, Recitation, Tutorial, Activity)**

 # Credit Hours: 1 !
 # Lecture Hours: **per week** !
 # Lab Hours: 2 **per week** !
Other: **per week**

Course Length: 15 **Weeks**

D. **WRITING INTENSIVE COURSE**: Yes ☒ No ☐

E. **GER CATEGORY: None:** ☐ **Yes:** GER 2 Natural Sciences !
***If course satisfies more than one*:** GER !

F. **SEMESTER(S) OFFERED: Fall** ☐ **Spring** ☒ **Fall & Spring** ☐

G. **COURSE DESCRIPTION:**

This is a laboratory course to accompany College Physics 2, PHYS122. Experiments examine electricity, DC circuits, and optics.

H. **PRE-REQUISITES: None** ☐ **Yes** ☐ **If yes, list below:**

PHYS 122, College Physics II or permission of instructor

CO-REQUISITES: None ☐ **Yes** ☒ **If yes, list below:**

PHYS 122, College Physics II

I. STUDENT LEARNING OUTCOMES: (*see key below*)

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

Course Student Learning Outcome [SLO]	***Program Student Learning Outcome [PSLO]***	***GER*** *[If Applicable]*	***ISLO & SUBSETS***	
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	W CA T Subsets
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 ISLO	W PS Subsets Subsets
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 ISLO	W PS Subsets Subsets
			ISLO ISLO ISLO	Subsets Subsets Subsets Subsets
			ISLO ISLO ISLO	Subsets Subsets Subsets Subsets

KEY	**Institutional Student Learning Outcomes [ISLO 1 – 5]**
ISLO #	**ISLO & Subsets**
1	**Communication Skills** Oral [O], Written [W]
2	**Critical Thinking** *Critical Analysis [CA] , Inquiry & Analysis [IA] , Problem Solving [PS]*
3	**Foundational Skills** *Information Management [IM], Quantitative Lit,/Reasoning [QTR]*
4	**Social Responsibility** *Ethical Reasoning [ER], Global Learning [GL],*

	Intercultural Knowledge [IK], Teamwork [T]
5	**Industry, Professional, Discipline Specific Knowledge and Skills**

*Include program objectives if applicable. Please consult with Program Coordinator

J. APPLIED LEARNING COMPONENT: Yes ☒ No ☐

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

☒ Classroom/Lab !	☐ Civic Engagement
☐ Internship	☐ Creative Works/Senior Project
☐ Clinical Placement	☐ Research
☐ Practicum	☐ Entrepreneurship (program, class, project)
☐ Service Learning	
☐ Community Service	

K. TEXTS:

N/A

L. REFERENCES:

Douglas C. Giancoli. Physics curriculum: Physics Principles with Applications. Upper Saddle River, NJ: Pearson Education.

M. EQUIPMENT: None ☐ Needed: 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: None ☐ Yes ☐

1. Ohm's Law: The current voltage characteristic will be obtained for different kinds of devices.

2.Resistivity: The geometric and physical properties of electrical conduction will be found by exploring the IV properties of different conducting wires.

3.Thermal coefficient of resistivity: The resistance of conductors and semi-conducting diodes as a function of temperature will be compared to predictions of the band theory.

4.Oscilloscope: Oscilloscopes will be used to measure voltage, frequency, half peak width and phase
shifts.

5.Terminal voltage: The IV power curve will be obtained for the output of a power source with a large internal resistance.

6.Potentiometer: The characteristics of a voltage divider will be examined. The divider will then be converted into a potentiometer to measure the electric potential of a fruit cell.

7.Capacitance: Time constants will be used to measure the capacitance of series and parallel connected capacitors.

8.RC circuits: Measure the charging and discharging behavior of a resistor capacitor circuit.

10.Reflection & Refraction: Rays will be traced for a plane mirror, a cylindrical mirror and a glass rectangular solid.

11. Lenses: Images and object positions are located on an optical bench and used to find the focal lengths of different optical lenses.

12. Diffraction: Diffraction gratings will be used to find the wavelength of spectral lines from gaseous discharge tubes.