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

MASTER SYLLABUS

COURSE NUMBER – COURSE NAME
PHYS 136 – UNIVERSITY PHYSICS LABORATORY II

Created by: Dr. Feng Hong

Updated by: Dr. Lawretta Ononye

Canino School of Engineering Technology !

Department: Physics !

Semester/Year: Fall 2018 !

A. **TITLE**: University Physics Laboratory II

B. **COURSE NUMBER:** PHYS 136

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

 # Credit Hours: 1 !
 # Lecture Hours: 1 **per week** !
 # Lab Hours: **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 University Physics II (PHYS132).
Experiments examine electricity, circuits, resistivity, capacitance and magnitism.

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

PHYS 135, University Physics Laboratory I or Permission of instructor

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

PHYS 132, University Physics II or permission of instructor

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			1-Comm Skills 2-Crit Think 4-Soc Respons	W CA T Subsets
b. Application of scientific data, concepts, and models in physics			1-Comm Skills 2-Crit Think 4-Soc Respons	W CA T Subsets
c. Use computer assisted data collection and analysis			1-Comm Skills 2-Crit Think 4-Soc Respons	W CA T 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 !
- ☐ Internship
- ☐ Clinical Placement
- ☐ Practicum
- ☐ Service Learning !
- ☐ Community Service
- ☐ Civic Engagement
- ☐ Creative Works/Senior Project
- ☐ Research
- ☐ Entrepreneurship (program, class, project)

K. ! **TEXTS:**

N/A

L. ! **REFERENCES:**

Raymond A. Serway and John W. Jewett (2011). Physics for Scientists and Engineers,9th Edition. Belmont, CA: Brooks/Cole.

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. ! **Self Inductance (2 week lab)**
The self inductance of a coil will be determined using an LC circuit. The result will be compared to theoretical calculations.

9. RLC circuits
Impedance of an RLC circuit is examined as a function of frequency. Resonant conditions are identified.

10. Optics
Reflection & Refraction
Lenses and Diffraction