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

MASTER SYLLABUS

COURSE NUMBER – COURSE NAME
PHYS 135 - UNIVERSITY PHYSICS LABORATORY I

Created by: Feng Hong

Updated by: Feng Hong

Canino School of Engineering Technology !

Department: PHYSICS !

Semester/Year: FALL/2018 !

A.   <u>**TITLE**</u>: University Physics Laboratory I

B.   <u>**COURSE NUMBER**</u>:   PHYS 135

C.   <u>**CREDIT HOURS**</u>: **(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.   <u>**WRITING INTENSIVE COURSE**</u>:   Yes ⊠   No ☐

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

F.   <u>**SEMESTER(S) OFFERED**</u>: **Fall** ⊠   **Spring** ☐   **Fall & Spring** ☐

G.   <u>**COURSE DESCRIPTION**</u>:

This is a laboratory course to accompany PHYS 131, University Physics I. Experiments will include one and two dimensional translational mechanics and graphical analysis.

H.   <u>**PRE-REQUISITES**</u>: **None** ⊠   **Yes** ☐   **If yes, list below:**

     <u>**CO-REQUISITES**</u>: **None** ☐   **Yes** ⊠   **If yes, list below:**

       PHYS 131, University Physics I 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. Understand 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 Subsets 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 CA 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
☐ Service Learning !   (program, class, project)
☐ Community Service

K. !   **TEXTS:**

N/A

L. !   **REFERENCES:**

Raymond A. Serway and John W. Jewett. Physics curriculum: 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** ☐

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**
      dditional 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
            cart.