

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



MASTER SYLLABUS

**COURSE NUMBER – COURSE NAME
PHYS 133 – University of Physics III**

Created by: Dr. Lawretta Ononye

Updated by: Dr. Lawretta Ononye

Canino School of Engineering Technology !

Department: Physics !

Semester/Year: Fall 2018 !

A. **TITLE:** University Physics III

B. **COURSE NUMBER:** PHYS 133

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

Credit Hours: 3

Lecture Hours: 3 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 the third semester of an introductory college physics course which uses basic calculus in developing some of the fundamental concepts of classical physics. Topics covered are rotation of rigid objects, static equilibrium of extended bodies, simple harmonic motion, gravitation, fluid mechanics, the law of thermodynamics and kinetic theory of gases.

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

PHYS 132 (University Physics II) or PHYS 122 (College Physics II)
or permission of instructor

CO-REQUISITES: None Yes If yes, list below:

I. STUDENT LEARNING OUTCOMES: (see key below)

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

<u>Course Student Learning Outcome</u> <u>[SLO]</u>	<u>Program Student Learning Outcome</u> <u>[PSLO]</u>	<u>GER</u> <i>[If Applicable]</i>	<u>ISLO & SUBSETS</u>	
a. Demonstrate an understanding of physics application of scientific data, concepts and models.			2-Crit Think ISLO ISLO	CA PS Subsets Subsets
b. Apply Newton's laws, the principles of conservation of angular momentum and energy to analyze and predict the rotational motion of simple mechanical systems.			2-Crit Think ISLO ISLO	CA PS Subsets Subsets
c. State the conditions of static equilibrium and solve static equilibrium problems.			1-Comm Skills 2-Crit Think ISLO	W CA PS Subsets
d. Demonstrate an understanding of the elastic properties of solid and interpret stress-strain curve.			2-Crit Think ISLO ISLO	CA PS Subsets Subsets
e. Explain simple harmonic motion and wave's motion including their properties.			1-Comm Skills 2-Crit Think ISLO	W CA Subsets Subsets

KEY	<u>Institutional Student Learning Outcomes [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

*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:

- | | |
|---|--|
| <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:**

Serway and Jewett (9th edition). Physics for Scientists and Engineers. Boston, MA: Brooks/Cole CENGAGE Learning.

L. **REFERENCES:**

None

M. **EQUIPMENT:** None Needed: Technology enhanced classroom

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

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

- Exams
- Quizzes
- Homework
- Participation
- Class project/presentation

P. **DETAILED COURSE OUTLINE:**

I. Rotation of a Rigid Object About a Fixed Axis

A. Rotational Kinematic

B. Relationships between angular and linear quantities

C. Rotational energy

D. Moment of inertia

E. Torque

F. Relationship between torque and angular acceleration

G. Work, power and energy in rotational motion

II. Rolling Motion, Angular Momentum and Torque

A. Rolling motion of a rigid body

B. The vector product and torque

C. Angular momentum of a particle and conservation of angular momentum

III. Static Equilibrium and Elasticity

- A. The conditions of equilibrium of a rigid object
- B. The center of gravity
- C. Elastic properties of solids

IV. Oscillatory Motion

- A. Simple harmonic motion
- B. Energy of a simple harmonic oscillator
- C. The pendulum

V. Wave Motion

- A. Types of waves
- B. Propagation of waves
- C. Sound waves

VI. The Law of Gravity

- A. Newton's Law of Universal Gravitation
- B. Weight and gravitational force
- C. Kepler's Laws

VII. Fluid Mechanics

- A. Pressure and its variation with depth
- B. Buoyant forces and Archimedes' principle
- C. Fluid dynamics
- D. Streamlines and the equation of continuity
- E. Bernoulli's equation and its applications

VIII. Thermodynamics

- A. Temperature and the Zeroth Law of Thermodynamics
- B. Thermometers and Temperature Scales
- C. Thermal Expansion of Solids and Liquids
- D. Kinetic theory of gases: Macroscopic Description of an Ideal Gas
- E. Heat transfer
- F. First Law of Thermodynamics
- G. Second Law of Thermodynamics

Q. LABORATORY OUTLINE: None Yes

N/A