

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



COURSE OUTLINE

PHYS 108 – TECHNICAL PHYSICS

Prepared By: Dr. Lawretta Ononye

**CANINO SCHOOL OF ENGINEERING TECHNOLOGY
PHYSICS
MARCH 2012**

- A. **TITLE:** TECHNICAL PHYSICS
- B. **COURSE NUMBER:** PHYS 108
- C. **CREDIT HOURS:** 4
- D. **WRITING INTENSIVE COURSE:** (No)
- E. **COURSE LENGTH:** 15 weeks
- F. **SEMESTER(S) OFFERED:** Spring
- G. **HOURS OF LECTURE, LABORATORY, RECITATION, TUTORIAL, ACTIVITY:**
4 lecture hours per week
- H. **CATALOG DESCRIPTION:**
This course is designed to introduce students to the physical laws and principles inherent in the study of mechanics, wave mechanics, optics, electricity and magnetism; time permitting modern physics. There will be emphasis placed on the following topics: vibrations and waves, electricity and magnetism, and wave optics. Dimensional analysis and problem solving will be stressed.
- I. **PRE-REQUISITES/CO-REQUISITES:**
a. Pre-requisite(s): Technical Math II (MATH 136) or permission of instructor
b. Co-requisite(s): none
- J. **GOALS (STUDENT LEARNING OUTCOMES):**
By the end of this course, the student will be able to:
1. Discuss the scientific method and its role in the development of physical sciences.
 2. Evaluate and describe a project/problem in the physical sciences.
 3. Solve problem in the physical sciences in a logical and defensible manner.
 4. Illustrate how the various topics of physics relate to everyday life.
 5. Perform calculations in the following: angles of reflection, focal lengths, pressure, density, flow rates, energy, momentum and impulse, torque, centripetal acceleration, and acceleration in free fall problems.
 6. Analyze and perform calculations in waves, speed of sound, Doppler shifts, and intensity.

<i>Course Objective</i>	<i>Institutional SLO</i>
a. Discuss the scientific method and its role in the development of physical sciences.	1. Communication 2. Crit. Thinking 3. Prof. Competence
b. Evaluate and describe a project/problem in the physical sciences.	1. Communication 2. Crit. Thinking 3. Prof. Competence
c. Solve problem in the physical sciences in a logical and defensible manner.	1. Communication 2. Crit. Thinking 3. Prof. Competence
d. Illustrate how the various topics of physics relate to everyday life.	2. Crit. Thinking 3. Prof. Competence
e. Perform calculations in the following: angles of	1. Communication

reflection, focal lengths, pressure, density, flow rates, energy, momentum and impulse, torque, centripetal acceleration, and acceleration in free fall problems.	2. Crit. Thinking 3. Prof. Competence
f. Analyze and perform calculations in waves, speed of sound, Doppler shifts, and intensity.	1. Communication 2. Crit. Thinking 3. Prof. Competence

K. **TEXTS:** Knight, Jones, and Field (2007). *College Physics - A strategic approach*. San Francisco, CA: Pearson Education.

L. **REFERENCES:** None

M. **EQUIPMENT:** Technology enhanced classroom

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

O. **MEASUREMENT CRITERIA/METHODS:**

- Exams
- Quizzes
- Homework
- Participation

P. **DETAILED COURSE OUTLINE:**

I. **Mechanics**

- A. Motion in one and two dimensions
- B. Vectors
- C. Newton's Laws of Motion
- D. Work and Energy
- E. Newton's Universal Law of Gravitation

II. **Vibrations and waves**

- A. Harmonic motion
- B. Pendulum motion
- C. Waves

III. **Light/Optics**

- A. Reflection and refraction
- B. Mirrors and lenses
- C. Wave optics
- D. Electromagnetic waves and photons
- E. Fiber optics: brief history of fiber; advantages and disadvantages; relative to physical plant; the construction of fiber; characteristic of fiber; propagation, modes, attenuation losses and connections

IV. **Electricity and Magnetism**

- A. Electric forces and fields
- B. Electrical potential and electrical energy
- C. Magnetism
- D. Induction and transformers

- V. **Thermal Physics**
 - A. Temperature and the Zeroth Law of Thermodynamics
 - B. Thermometers and Temperature Scales
 - C. Thermal Expansion of Solids and Liquids

Q. **LABORATORY OUTLINE: NA**