

Course discipline/number/title: PHYS 1101: Elements of Physics

A. CATALOG DESCRIPTION

1. Credits: 3
2. Hours/Week: 2 Lecture, 2 Lab
3. Prerequisites (Course discipline/number): MATH 0098 or equivalent
4. Other requirements: None
5. MnTC Goals (if any): Goal 3/Natural Sciences

B. COURSE DESCRIPTION: This course is a conceptual introduction to physics, the study of the fundamental laws and principles that underlie the physical universe. Content covered includes units and measurements, linear motion, Newton's Laws of motion, momentum, energy, temperature, heat transfer, vibrations, waves, sound, electrostatics and simple circuits. Elementary algebra is used.

C. DATE LAST REVISED (Month, year): February, 2025

D. OUTLINE OF MAJOR CONTENT AREAS:

1. Background
 - a) Scientific world view, theory
 - b) Measurements, unit systems
2. Mechanics
 - a) Linear Motion
 - b) Newton's Laws of Motion
 - c) Momentum
 - d) Energy
3. Thermal Physics
 - a) Gases
 - b) Temperature, thermal expansion
 - c) Heat transfer
4. Vibrations and waves
 - a) Oscillations
 - b) Wave properties
 - c) Sound
5. Electricity
 - a) Electrostatics
 - b) Current, voltage, resistance
 - c) Simple circuits

E. LEARNING OUTCOMES (GENERAL): The student will be able to:

1. Use common definitions of terms found in physics.
2. Explain and apply basic physics principles to their everyday lives.
3. Use critical thinking and problem-solving skills to explore physical principles.

F. LEARNING OUTCOMES (MNTC):

Goal 3/Natural Sciences: The student will be able to:

1. Demonstrate understanding of scientific theories.
2. Formulate and test hypotheses by performing laboratory, simulation, or field experiments in at least two of the natural science disciplines. One of these experimental components should develop, in greater depth, student's laboratory experience in the collection of data, it's statistical and graphical analysis, and an appreciation of its sources of error and uncertainty.
3. Communicate their experimental findings, analyses, and interpretations both orally and in writing.

G. METHODS FOR EVALUATION OF STUDENT LEARNING: Methods may include but are not limited to:

1. Objective exams
2. Lab exams

- G. METHODS FOR EVALUATION OF STUDENT LEARNING: Methods may include but are not limited to: Continued.
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 - 3. Research papers
 - 4. Quizzes
 - 5. Written homework
 - 6. Online homework
 - 7. Small group projects
 - 8. Oral presentations
 - 9. Laboratory reports
- H. RCTC CORE OUTCOME(S). This course contributes to meeting the following RCTC Core Outcome(s):
Critical Thinking. Students will think systematically and explore information thoroughly before accepting or formulating a position or conclusion.
- I. SPECIAL INFORMATION (if any):
- 1. A scientific calculator is required