PHYS A110: CONCEPTUAL PHYSICS

Item	Value
Curriculum Committee Approval Date	03/20/2024
Top Code	190200 - Physics, General
Units	3 Total Units
Hours	54 Total Hours (Lecture Hours 54)
Total Outside of Class Hours	0
Course Credit Status	Credit: Degree Applicable (D)
Material Fee	No
Basic Skills	Not Basic Skills (N)
Repeatable	No
Open Entry/Open Exit	No
Grading Policy	Standard Letter (S), • Pass/No Pass (B)
Associate Arts Local General Education (GE)	• Area 5 Physical and Biological Sciences, Scientific Inquiry, Life Science (OB)
Associate Science Local General Education (GE)	• Area 5 Physical and Biological Sciences, Scientific Inquiry, Life (OSB)
California General Education Transfer Curriculum (Cal-GETC)	• Cal-GETC 5A Physical Science (5A)
Intersegmental General Education Transfer Curriculum (IGETC)	• IGETC 5A Physical Science (5A)
California State University General Education Breadth (CSU GE-Breadth)	• CSU B1 Physical Science (B1)

Course Description

A brief, but complete presentation of the fundamental phenomena and laws in physics, with experimental illustrations, enhancing the development of conceptual scientific thinking. ADVISORY: Successful completion of a course at the level of beginning algebra or Appropriate OCC math placement. Transfer Credit: CSU; UC: Credit Limitation: No credit for PHYS A110, PHYS A111 if taken after PHYS A120, PHYS A130 or PHYS A185.

Course Level Student Learning Outcome(s)

1. State the basic principles of mechanics, fluids, thermodynamics, waves, electromagnetism, and modern physics, define important scientific terms in these areas, and give an explanation of how they apply to real-world situations.
2. Use conceptual reasoning to solve problems involving the laws of physics.

Course Objectives

- 1. Use the fundamental laws of physics and methods of science in solving concept-type problems.
- 2. Relate and explain their experiences in terms of the fundamental laws of physics and acquire knowledge about accomplishments and limitations of physics, and experience physics as a human and creative enterprise.
- 3. Demonstrate their understanding and problem-solving ability by their classroom participation, their performance on recommended exercise, their performance on the four achievements tests, and on the final examination for the course.
- 4. Differentiate between concept, hypothesis, model, and theory.
- 5. Define scientific terms and concepts precisely.
- 6. Demonstrate the ability to communicate the principles of science and of physics to his or her peers.
- 7. Critically evaluate scientific data and arguments encountered in daily life.
- 8. Recognize, examine and describe selected physical systems and phenomena.

Lecture Content

Perception and Discovery Epistemology Ideas about Motion Gravitational Interactions and Energy Relativity: Another-look at Motion Electromagnetic Interactions and Energy Macroscopic properties of Matter and Thermodynamics Vibrations and Wave Phenomena (of particles and fields) Quantum Phenomena Nuclear Interactions and Energy

Method(s) of Instruction

- Lecture (02)
- DE Live Online Lecture (02S)
- DE Online Lecture (02X)

Instructional Techniques

Lecture and some demonstrations will be used to present the basic concepts. Various methods and strategies of problem-solving are taught by thoroughly discussing typical sample problems in the class. Students are provided with an environment that encourages participation with the instructor, i.e. during the office hours of the instructor as well as during the experimentation in the lab, students have the opportunity to interact with the instructor.

Reading Assignments

Approximately one hour per week of reading from the textbook is required.

Writing Assignments

To promote critical thinking component, problem solving will be emphasized in the homework and exams.

Out-of-class Assignments

Aproximately two hours per week of reading and doing homework is required.

Demonstration of Critical Thinking

Tests and quizzes.

Required Writing, Problem Solving, Skills Demonstration

To promote critical thinking component, problem solving will be emphasized in the homework and exams.

Eligible Disciplines

Physics/Astronomy: Master's degree in physics, astronomy, or astrophysics OR bachelor's degree in physics or astronomy AND master's degree in engineering, mathematics, meteorology, or geophysics OR the equivalent. Master's degree required.

Textbooks Resources

1. Required Hewitt, P.. Conceptual Physics, 13th ed. Chicago: Pearson, 2021 Rationale: -