COURSE OUTLINE OF RECORD

Number: PHYS G110  TITLE: Conceptual Physics

ORIGINATOR: James Almy  EFF TERM: Fall 2011
FORMERLY KNOWN AS:  DATE OF
OUTLINE/REVIEW: 12-09-2008
CROSS LISTED COURSE:

SEMESTER UNITS: 3.0
HRS LEC: 54.0  HRS LAB: 0.0  HRS OTHER: 0.0
CONTACT HRS TOTAL: 54.0
STUDY NON-CONTACT HRS RECOMMENDED: 108.0

CATALOG DESCRIPTION:
A course designed for non-science majors which considers the everyday applications of physics. This course is a non-mathematical approach to the basic concepts of physics. Open to students with or without high school physics, but not open to those who have credit for any college physics course. It covers the subjects of motion, energy, waves, music, electromagnetism, relativity and nuclear energy. UC Credit Limitations: No credit if taken after G120 or G185.

JUSTIFICATION FOR COURSE:

PREREQUISITES:

COREQUISITES:

ADVISORIES:

ASSIGNED DISCIPLINES:

MATERIAL FEE: Yes [ ] No [X] Amount: $0.00

CREDIT STATUS: Noncredit [ ] Credit - Degree Applicable [X] Credit - Not Degree Applicable [ ]

GRADING POLICY: Pass/No Pass [X] Standard Letter [X] Not Graded [ ] Satisfactory Progress [ ]

OPEN ENTRY/OPEN EXIT: Yes [ ] No [X]

TRANSFER STATUS: CSU Transferable[ ] UC/CSU Transferable[X] Not Transferable[ ]

LEVELS BELOW TRANSFER: Not Applicable

CALIFORNIA CLASSIFICATION CODES: Y - Not Applicable

NON CREDIT COURSE CATEGORY: Y - Not applicable, Credit Course

OCCUPATIONAL (SAM) CODE: E

REPEATABLE ACCORDING TO STATE GUIDELINES: No [X] Yes [ ] NUMBER REPEATS:

REQUIRED FOR DEGREE OR CERTIFICATE: No [ ] Yes [X]
Liberal Arts: Emphasis in Science(Associate in Arts)

GE AND TRANSFER REQUIREMENTS MET:

IGETC Area 5: Physical and Biological Sciences
  5A: Physical Science
    x
  x

CSU GE Area B: Scientific Inquiry and Quantitative Reasoning
  B1 - Physical Science
COURSE LEVEL STUDENT LEARNING OUTCOME(S) Supported by this course:

1. describe the following: the relationship of work and energy, the various types of energy, the application of the conservation of energy to conceptual questions, the postulates of special relativity and the changes in matter that occur as velocity increases, various types of mechanical waves, a standing wave and its application to music, similarities and differences between the electric field and the magnetic field, the three main types of nuclear emissions, and two main areas of research in fusion reactor design.
2. demonstrate knowledge of Newton’s 3 Laws of Motion, electrical generation regarding Faraday’s Law, the role of fission in a nuclear bomb and a nuclear reactor, and the role of fusion in a nuclear bomb.
3. apply the following: momentum laws to answer conceptual questions and Coulomb’s law to answer conceptual questions about electrical force.
4. explain role of interference in the formation of a standing wave; the role of Fourier analysis in the role of pitch, quality, and digital music; the difference between electrical potential energy and electric potential; the relationship between voltages, resistances, and currents in series and parallel circuits; the relationship between voltages, resistances, and currents in series and parallel circuits; and the theory of operation of an electrical transformer.

COURSE OBJECTIVES:
1. answer questions about motion by applying Newton’s 3 laws.
2. apply momentum laws to answer conceptual questions.
3. define work and answer questions by applying the relationship of work and energy.
4. describe various types of energy and apply the conservation of energy to conceptual questions.
5. describe the various types of mechanical waves.
6. describe a standing wave and its application to music.
7. explain the role of interference in the formation of a standing wave.
8. explain the role of Fourier analysis in the role of pitch, quality, and digital music.
9. use Coulomb’s law to answer conceptual questions about electrical force.
10. explain the difference between electrical potential energy and electric potential.
11. explain the relationship between voltages, resistances, and currents in series and parallel circuits.
12. explain the relationship between voltages, resistances, and currents in series and parallel circuits.
13. answer questions about electrical generation by applying Faraday’s law.
14. explain the theory of operation of an electrical transformer.
15. state the postulates of special relativity and describe the changes in matter that occur as velocity increases.
16. describe the three main types of nuclear emissions.
17. answer questions about the role of fission in a nuclear bomb and a nuclear reactor.
18. answer questions about the role of fusion in a nuclear bomb.
19. describe the two main areas of research in fusion reactor design.

COURSE CONTENT:

LECTURE CONTENT:

A. Motion
B. Energy and Momentum
C. Waves, Sound, Music
D. Circuits and Electromagnetism
E. Special Relativity
F. Nuclear Energy
METHODS OF INSTRUCTION:

A. Lecture:
B. Independent Study:

INSTRUCTIONAL TECHNIQUES:

COURSE ASSIGNMENTS:

  Reading Assignments
  Practical Physics, Wilson, Saunders Publishing, or equivalent Various current periodicals

  Out-of-class Assignments
  Researched reading - reports

  Writing Assignments
  Essay exam questions

METHODS OF STUDENT EVALUATION:

Midterm Exam
Final Exam
Short Quizzes
Written Assignments
Essay Examinations
Objective Examinations
Report
Problem Solving Exercises

  Demonstration of Critical Thinking:
  Applying Newton's Laws of Motion to conceptual questions.

  Required Writing, Problem Solving, Skills Demonstration:
  1. Essay exam questions 2. Simple application of arithmetic problem solving

TEXTS, READINGS, AND RESOURCES:

  TextBooks:

LIBRARY:

  Adequate library resources include: Non-Print Materials

  Comments:

Attachments:

  Attached Files