ROCHESTER COMMUNITY AND TECHNICAL COLLEGE

COMMON COURSE OUTLINE

Course discipline/number/title: PHYS 1128: Classical Physics II

A. CATALOG DESCRIPTION
1. Credits: 5
2. Hours/Week: 4 lecture, 3 lab
3. Prerequisites (Course discipline/number): MATH 1127
4. Other requirements: None
5. MnTC Goals (if any): Goal3/Natural Science

B. COURSE DESCRIPTION: This course is the second semester of a two-semester introduction to classical physics using the mathematics of vectors and calculus. Students should either have already taken or be concurrently enrolled in Calculus II (MATH 1128). Topics studied include temperature, heat, the first and second laws of thermodynamics, electrostatics, electric and magnetic fields, simple DC circuits, Kirchhoff's Laws, Ampere's Law, Faraday's Law, resistance, capacitance, inductance, AC circuits, electromagnetic waves, geometric and physical optics. These topics are studied through lecture, discussion, interactive problem-solving, demonstrations, hands-on laboratories, and independent work. Emphasis is on both conceptual learning and problem solving. The laboratory experience will provide the student with opportunities for discovery, measurement, report writing and data analysis.

C. DATE LAST REVISED (Month, year): March 2019

D. OUTLINE OF MAJOR CONTENT AREAS:
1. Thermodynamics
   a) Kinetic theory
   b) Heat engines
   c) First and Second Law
2. Electrostatics
   a) Fields
   b) Potential
   c) Capacitance
3. Magnetism
   a) Fields and Forces
   b) Sources
   c) Faraday's Law
   d) Inductance
4. Circuits
   a) Resistance and Ohm's Law
   b) Direct Current circuits
   c) Alternating Current circuits
5. Optics
   a) Geometric optics
   b) Physical optics

E. LEARNING OUTCOMES (GENERAL): The student will be able to:
1. Define physical terms and use them appropriately.
2. Explain and apply physics principles to their everyday lives and explain many phenomena using these principles.
3. Apply algebra and calculus to problem-solving of physical systems.
4. Write clear and complete laboratory reports.

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,
3.

F. LEARNING OUTCOMES (MNTC): Continued. . .
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.
4. 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. Homework
2. Conceptual and problem-solving exams
3. Laboratory reports
4. Classroom projects and presentations

H. RCTC CORE OUTCOME(S). This course contributes to meeting the following RCTC Core Outcome(s):
Communication. Students will communicate appropriately for their respective audiences.

Critical Thinking. Students will think systematically and explore information thoroughly before accepting or formulating a position or conclusion.

I. SPECIAL INFORMATION (if any): None