

North Central **Michigan College**

NCMC CURRICULUM/COURSE OUTLINE FOR YEARS: 2001-2003

DIVISION/AREA: Sciences, Health and Human Services

DEPARTMENT: Science

AREA DEAN: Timothy Dykstra, Ph.D.

ORIGINATOR:

TOTAL HOURS OF INSTRUCTION: Lecture: 3 Lab: 2 Total Contact Hours:

COURSE NUMBER: PHYS 127

CREDIT HOURS: 4

COURSE TITLE: PHYSICAL SCIENCE I

PREREQUISITE(S)/COREQUISITE(S)/ADVISORY: None

CATALOG DESCRIPTION: A predominantly non-mathematical approach to physics and chemistry for non-science majors, with content especially relevant for those planning to become elementary school teachers. Historical aspects and methods of science are presented, along with practical applications of physics and chemistry to everyday life.

GENERAL EDUCATION OUTCOMES OR OCCUPATIONAL PROGRAM OUTCOMES

Refer to College catalog or specific occupational program outcomes and describe how this course meets those outcomes.

COURSE OBJECTIVES & OUTCOMES: Upon successfully completing this course, you should be able to: (1) recognize the basic concepts and principles of mechanics, properties of matter, thermal physics, waves, sound, electricity, magnetism, light, and atomic and nuclear physics in your own experiences with the physical universe, (2) apply these basic concepts and principles of physical science to your area of academic interest, (3) apply critical thinking and problem-solving skills to the analysis and comprehension of the physical universe, and (4) effectively use selected laboratory instruments and techniques to collect, analyze, and interpret physical data.

METHODS OF INSTRUCTION: Lecture, lab, and discussion

COURSE TITLE AND NUMBER: PHYSICAL SCIENCE I PHYS 127

METHODS OF EVALUATION: Assignments, Labs, Exams, Quizzes

REQUIRED TEXTS: (Representative List)

The Physical Universe, 9th ed., by Krauskopf and Beiser

Study Guide, 9th ed., by Carey and Beiser

Optional supplementary Materials:

Reasonable accommodations may be provided for students with documented physical, sensory, cognitive, systemic, and/or psychiatric disabilities. Please contact the Education Opportunity Program (EOP) at (231) 348-6687 to arrange services for this course.

TIME ALLOWANCE AND SEQUENCE OF INSTRUCTION:

COURSE CONTENT: The course is scheduled to include the following general topics:

- A. The Scientific Method (Ch. 1)
- B. Mechanics
 - 1. Motion (Ch. 2)
 - a. Kinematics
 - b. Dynamics
 - c. Circular motion
 - d. Gravity
 - 2. Energy (Ch. 3)
 - a. Work
 - b. Energy
 - c. Linear and angular momentum
 - d. Special and general relativity
- C. Thermal Physics (Ch. 4)
 - 1. Temperature and heat
 - 2. Fluids
 - 3. The kinetic theory of matter
 - 4. Changes of state
 - 5. Thermodynamics
- D. Electricity and Magnetism (Ch. 5)
 - 1. Electrostatics
 - 2. Electric current
 - 3. Magnetism
 - 4. Electromagnetic induction
- E. Waves (Ch. 6)
 - 1. Wave motion
 - 2. Wave behavior
 - 3. Electromagnetic waves
 - 4. Light
- F. Nuclear Physics (Ch. 7)
 - 1. The Rutherford model
 - 2. Radioactivity
 - 3. Nuclear energy
 - 4. Fission and fusion
 - 5. Elementary particles
- G. Atomic and Quantum Physics (Ch. 8)
 - 1. Quantum theory of light
 - 2. Atomic spectra