

North Central Michigan College

NCMC MASTER COURSE SYLLABUS FOR YEARS 2001-2003

DIVISION/AREA: Sciences, Health and Human Services

DEPARTMENT: Science

DIVISION DIRECTOR: Polly Flippo, MSN,RN

ORIGINATOR: Brian Peterson

DEAN OF INSTRUCTION: Timothy Dykstra, PhD

TOTAL HOURS OF INSTRUCTION: LECTURE: 1 LAB: 0 TOTAL CONTACT HOURS: 17.6

COURSE NUMBER: PHY 212

CREDIT HOURS: 1-0

COURSE TITLE: Calculus Applications to Physics 210

TRANSFERABLE YES: NO: TO: Most

PREREQUISITE(S)/COREQUISITE(S)/ADVISORY:

MTH 122 or equivalent
PHY 210

CATALOG DESCRIPTION:

An introduction to the principles and practical applications of mechanics (including kinematics, dynamics, energy, momentum, simple harmonic motion, and fluids) and thermal physics using concepts from differential and integral calculus. Represents the first semester of a one-year introduction. This course is intended for students who require a calculus-based physics course in preparation for further study in the physical sciences beyond this sequence.

GENERAL EDUCATION OUTCOMES:

The purpose of General Education requirements in our degree programs is to enable students to develop their ability to reason, to communicate effectively in both oral and written form, and to acquire sufficient knowledge of their heritage to participate fully in society and the world.

COURSE OBJECTIVES & OUTCOMES:

Upon successfully completing this course, you should be able to: (1) recognize the basic concepts and principles of mechanics and thermal physics in your own experiences with the physical universe, (2) apply the basic concepts and principles of mechanics and thermal physics to your area of academic interest, (3) use appropriate quantitative techniques to analyze and comprehend the physical universe, and (4) apply critical thinking and problem-solving skills to the analysis and comprehension of the physical universe.

METHODS OF INSTRUCTION:

Lecture, discussion

METHODS OF EVALUATION:

Homework, exams

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COURSE TITLE AND NUMBER: PHY 212 Calculus Applications to Physics 210

REQUIRED TEXTS:

Physics for Scientists & Engineers, 5th ed., vol. 1, by R.A. Serway & R.J. Beichner

Student Solutions Manual & Study Guide, by John R. Gordon, Ralph McGrew, & R. A. Serway

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:

This course is scheduled to include the following general topics:

A. Introduction

1. Dimensional analysis (Ch. 1)
2. Unit vectors (Ch. 3)

B. Mechanics

1. Kinematics
 - a. One-dimensional kinematics (Ch. 2)
 - b. Two-dimensional kinematics (Ch. 4)
 - c. Rotational kinematics (Ch. 4)
2. Dynamics
 - a. Forces (Ch. 14)
 - b. Rotational dynamics (Ch. 10 & 11)
3. Work and Energy (Ch. 7 & 8)
4. Impulse and Momentum (Ch. 9)
5. Fluids (Ch. 15)

C. Thermal Physics (Ch. 20)

1. Temperature and heat
2. Heat transfer
3. Thermodynamics

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