

# North Central Michigan College

NCMC MASTER COURSE SYLLABUS FOR YEARS 2001-2003

DIVISION/AREA: Sciences, Health and Human Services DEPARTMENT: Science

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DIVISION DIRECTOR: Polly Flippo, MSN,RN ORIGINATOR: Brian Peterson

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DEAN OF INSTRUCTION: Timothy Dykstra, PhD

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

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COURSE NUMBER: PHY 213 CREDIT HOURS: 1-0

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COURSE TITLE: Calculus Applications to Physics 211

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**TRANSFERABLE** YES: NO: TO: Most

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

Completion of PHY 212 with a C or better  
PHY 211

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CATALOG DESCRIPTION:

A continuation of PHY 212. Topics include the principles and practical applications of wave motion, electricity, magnetism, light, optics, and modern physics using concepts from differential and integral calculus.

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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.

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COURSE OBJECTIVES & OUTCOMES:

Upon successfully completing this course, you should be able to: (1) recognize the basic concepts and principles of mechanical waves, electricity and magnetism, light and optics, and modern physics in your own experiences with the physical universe, (2) apply the basic concepts and principles of mechanical waves, electricity and magnetism, light and optics, and modern 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.

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METHODS OF INSTRUCTION: Lecture, discussion.

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METHODS OF EVALUATION: Homework, quizzes, exams.

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REQUIRED TEXTS:

**Physics for Scientists & Engineers**, 5th ed., vol. 2, by R.A. Serway and R.J. Beichner  
**Student solutions Manual & Study Guide**, by John R. Gordon, Ralph McGrew, and 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. Mechanical Waves**

1. Wave motion (Ch. 16)
2. Superposition and Standing Waves (Ch. 18)

**B. Electricity and Magnetism**

1. Electric fields (Ch. 23 & 24)
2. Electric potential (Ch. 25)
3. Electric circuits: DC (Ch. 27)
4. Magnetic fields (Ch. 29 & 30)
5. Electromagnetic induction (Ch. 31 & 32)

**C. Light and Optics**

1. Electromagnetic waves (Ch. 34)
2. The Nature of Light (Ch. 35)

**D. Modern Physics**

Quantum mechanics (Ch. 41)

APPROVED FOR ADOPTION BY THE CRD/AP COMMITTEE ON \_\_\_\_\_