A. Course Description

Credits: 5

Prerequisites: MATH 208 Applied Calculus AND PHYS 211 Calculus Based Physics I

OR

MATH 210 Calculus I AND PHYS 211 Calculus Based Physics I

Lab Hours/ Weeks: Corequisites: None

Lecture Hours/ Week :

MnTC Goals: None

This is the second course of a two semester sequence covering the fundamental concepts of physics. This course covers oscillatory motion, waves, superposition and interference of waves, diffraction, electricity and magnetism, electric circuits, light, mirrors and lenses. Laboratories emphasize application of physics concepts and quantitative problem solving skills. Intended for science majors.

B. Course Effective Dates: 01/08/2007 - 05/03/2011 05/04/2011 - Present

C. Outline of Major Content Areas:

See Course Description for major content areas.

D. Learning Outcomes (General)

1. Communicate their experimental findings, analyses, and interpretations both orally and in writing.
2. Demonstrate understanding of scientific facts and theories in physics.
3. Evaluate societal issues from a natural science perspective, ask questions about the evidence presented, and make informed judgments about science-related topics and policies.
4. Formulate and test hypotheses by experiment in physics, including the collection of data, statistical and graphical analysis of results, and interpretation of its sources of error and uncertainty.
5. Ability to use the above listed physics knowledge in quantitative problem solving.
6. Demonstrate quantitative reasoning skills and competency with arithmetic, algebra, calculus and elementary statistics at a level appropriate for graduates of bachelor's degree programs in the sciences.
7. Recall, describe and apply the concepts, knowledge and vocabulary of physics at the level necessary for success in a second semester Calculus-Based Physics course.
8. Understand magnetic fields, solenoids, inductance, Faraday's law, Lenz's law, the formation of AC current, and how electromagnetic waves are formed.
9. Understand oscillatory motion and waves, including superposition, interference, and diffraction of waves, sound waves and Doppler effect.
10. Understand the principles of geometric optics and physical optics.
11. Understand the principles of quantization and conservation of electric charge, Coulomb's Law, Gauss's law qualitatively, the concepts of electric field, electric potential, electric potential energy, capacitors, the formation of DC current, Ohm's law, the rules of series and parallel connections of resistors, Kirchhoff's rules, energy dissipation and transformation in an electric circuit.

E. Learning Outcomes (MN Transfer Curriculum)

This contains no goal areas.
G. Special Information

Note: First day attendance required except by instructor permission