COURSE DESCRIPTION

Dept., Number	Phys 212	Course Title	Physics for Science and Engineering II
Semester hours	3	Course Coordinator	Robert Kroeger, Professor

Current Catalog Description (approved for 2008-9)

A calculus-based introduction to electricity, magnetism, electromagnetic waves and related topics including geometrical and physical optics. Second part of a two-semester survey of classical physics.

Textbook

Halliday, Resnick, and Walker. *Fundamentals of Physics, 8th edition*, Wiley, 2007.

References

Course Outcomes

After successfully completing this course, the students should:

1. understand the role of fields and potentials in the solving of problems in electromagnetism,
2. know how apply these concepts through the analytical tools of calculus, vector algebra, and trigonometry to solve physical problems.
3. have enhanced capacities for analytical reasoning and problem solving.

Relationship between Course Outcomes and Program Outcomes

The ABET/CAC criteria for computer science require 30 credit hours of science and mathematics appropriate for the discipline. The BSCS program meets this criterion by requiring 14 hours of natural science courses intended for majors in those fields, including a two-course sequence with associated laboratories in one field, and 18 hours of mathematics beyond the pre-calculus level. Physics 211 and 212 and their associated laboratories, Physics 221 and 222, form one option for satisfying the laboratory science requirement. The course outcomes are related to the expectations for the role of natural science in the BSCS curriculum.

Prerequisites by Topic

1. First half of two course sequence (Phys 211)
2. Introductory differential and integral calculus (Math 261, corequisite of Math 262)
3. Corequisite of the associated laboratory (Phys 222)

Major Topics Covered in the Course

1. Electric charge
2. Electric field
3. Gauss' law
4. Electric potential and voltage
5. Capacitance and dielectrics
6. Current and resistance
7. DC circuits
8. Magnetic fields
9. Biot Savart law and Ampere's law
10. Faraday's law and Lenz's law
11. Oscillation and AC circuits
12. Maxwell's equations
13. Electromagnetic waves
14. Light and geometric optics
15. Interference
16. Diffraction

Assessment Plan for the Course

The instructor assesses the student performance related to the course outcomes by using examinations, quizzes, and homework assignments.

How Data in the Course are Used to Assess Program Outcomes (unless adequately covered already in the assessment discussion under Criterion 4)

The conduct of this course is not governed by the ABET program faculty. No data are collected that are used to assess program outcomes directly.

Estimate Curriculum Category Content (Semester hours)

Science 3 hours