

SMU Summer 2010
Physics 1308 : Electromagnetism
Syllabus

Instructor : Will McElgin

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Office Hours : Monday, Wednesday, Friday – 12-2pm

Text : Wolfson, “Essential University Physics : Vol 2”

Course Website : www.physics.smu.edu/mcelgin/P1308_summer2010/P1308.html

Lecture Times : MTWRF – 9:00am-10:50am

Lecture Location : Fondren 158

Description of the Course

This course is intended as a calculus-based introduction to thermodynamics, electromagnetism, and related topics. Initially, there will be a discussion of the concepts of electric charge and field. Following this, there will be a treatment of electric current, magnetism, and electromagnetic induction. To complete the foundations of electromagnetism, the last of Maxwell’s equations will then be introduced. This permits a description of light as electromagnetic radiation. Some topics in optical physics, including reflection and refraction, will be covered. Finally, a treatment of special relativity will be given. There will be an emphasis on in-class problem solving using similar ideas and techniques as required on homework and exams.

Evaluation

Grading will be entirely based on three exams (33% each). Homework will be assigned but not collected. Attendance in class is strongly expected and, unless expressly told otherwise, students are responsible for all aspects of the class discussion.

Instructor Formulated Student Learning Outcomes

It is expected that students should be able to incorporate physical concepts with mathematical techniques to solve problems in Electromagnetism and related topics. While only algebraic techniques will be required on exams, calculus will be utilized in the class discussion and in selected homework problems, and is expected that students will be conversant in these descriptions of physics.

General Education Student Learning Outcomes

Students demonstrate the ability to understand, critique, and draw conclusions from numerical arguments and data. Students demonstrate basic facility with the methods and approaches of scientific inquiry and problem-solving.

Schedule

- 7/1 : Electric Charge and Force. The Electric Field. Chapter 20.
- 7/2 : The Electric Field. Chapter 20.
- 7/6 : The Electric Field and Gauss's Law. Chapters 20 and 21.
- 7/7 : The Electric Field and Gauss's Law. Chapters 20 and 21.
- 7/8 : Gauss's Law. Chapter 21.
- 7/9 : Gauss's Law. Chapter 21.
- 7/12 : Exam 1.
- 7/13 : Magnetic Force and Fields. Chapter 26.
- 7/14 : Magnetic Force and Fields. Chapter 26.
- 7/15 : Magnetic Force and Fields. Chapter 26.
- 7/16 : Electromagnetic Induction. Chapter 27.
- 7/19 : Electromagnetic Induction. Chapter 27.
- 7/20 : Electromagnetic Induction. Chapter 27.
- 7/21 : Exam 2.
- 7/22 : Maxwell's Equations and Light. Chapter 29.
- 7/23 : Maxwell's Equations and Light. Chapter 29.
- 7/26 : Maxwell's Equations and Light. Chapter 29.
- 7/27 : Reflection and Refraction. Chapter 30.
- 7/28 : Reflection and Refraction. Chapter 30.
- 7/29 : Relativity. Chapter 33.
- 7/30 : Relativity. Chapter 33.
- 8/2 : Exam 3.