



Hunan University PHYS 21: Electricity and Magnetism

Professor: To be announced
Total contact hours: 54 hours
Credit: 4

Course Description

This course is intended as a calculus-based introduction to electromagnetism and related topics. Initially, the concepts of vector calculus, electrostatics and conductors, Laplace's equation, electrostatics and dielectrics, electromagnetism relativity and optics, etc. To complete the foundations of electromagnetism, the last of Maxwells equations will also be introduced. This permits a description of light as electromagnetic radiation. Various topics in the physics light will be covered, including refraction, interference and diffraction. 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.

Required Material

Textbook: *Electromagnetism*
Author: Gerald Pollack, Daniel Stump
Publisher: Addison-Wesley
Publication Date: October 12, 2001

Grading

- Assignment 1 20%
- Assignment 2 20%
- Midterm Exam 20%
- Final Exam 40%

A+ 96-100	A 90-95	A- 85-89
B+ 82-84	B 78-81	B- 75-77
C+ 71-74	C 66-70	C- 62-65
D 60-61	F < 60	



Course Schedule

The course has 24 class sessions in total. All sessions are 2 hours and 15 minutes in length.
Note: the course outline and required readings are subject to change.

Class 1:

Introduction of the course

1. History and Perspective

Class 2:

2. Vector Calculus

Class 3:

2. Vector Calculus (Cont.)

Class 4:

3. Basic Principles of Electrostatics

Class 5:

3. Basic Principles of Electrostatics (Cont.)

Assignment 1

Class 6:

4. Electrostatics and Conductors

Class 7:

4. Electrostatics and Conductors (Cont.)

Class 8:

5. General Methods for Laplace's Equation.

Class 9:

5. General Methods for Laplace's Equation (Cont.)

Class 10:

6. Electrostatics and Dielectrics

Assignment 2

Class 11:

7. Electric Current

Class 12:

8. Magnetostatics

Class 13:



9. Magnet Fields in Matter

Class 14:

10. Electromagnetic Induction

Class 15:

11. The Maxwell Equations

Midterm

Class 16:

12. Relativity and Electrodynamics

Class 17:

13. Optics and Electromagnetic Waves

Class 18:

13. Optics and Electromagnetic Waves (Cont.)

Class 19:

14. Wave Guides and Transmission Lines

Class 20:

14. Wave Guides and Transmission Lines (Cont.)

Class 21:

15. Radiation by Currents and Charges

Class 22:

15. Radiation by Currents and Charges (Cont.)

Class 23:

Review and preparation for the final exam

Class 24:

Final Exam

Attending Policy

Regular and prompt attendance is required. Under ordinary circumstances, you may miss two times without penalty. Each absence over this number will lower your course grade by a third of a letter and missing more than five classes may lead to a failing grade in the course. Arriving late and/or leaving before the end of the class period are equivalent to absences.



Policy on “Late Withdrawals”

In accordance with university policy, appeals for late withdrawal will be approved ONLY in case of medical emergency and similar crises.

Academic Honesty

Hunan University expects all students to do their own work. Instructors will fail assignments that show evidence of plagiarism or other forms of cheating, and will also report the student's name to the University administration. A student reported to the University for cheating is placed on disciplinary probation; a student reported twice is suspended or expelled.

General Expectations:

Students are expected to:

- Attend all classes and be responsible for all materials covered in class and otherwise assigned;
- Complete the day's required reading and assignments before class;
- Review the previous day's notes before class and make notes about questions you have about the previous class or the day's reading;
- Participate in class discussions and complete required written work on time;
- Refrain from texting, phoning or engaging in computer activities unrelated to class during the class period;
- While class participation is welcome, even required, you are expected to refrain from private conversations during the class period.

Special Needs or Assistance

Please contact the Administrative Office immediately if you have a learning disability, a medical issue, or any other type of problem that prevents professors from seeing you have learned the course material. Our goal is to help you learn, not to penalize you for issues which mask your learning.