

Syllabus-PHYS 3185-Electricity & Magnetism I

Prof. M. Alper Sahiner

Physics Dept.

Office: Mooney Hall, 3rd Floor Room 313, Ph: 761 9060,

e-mail: sahineme@shu.edu

Office hours: *Monday: 3:30-4:30pm, Tuesday: 10:30am-12:00n*

Textbook: Introduction to Electrodynamics by *David J. Griffiths*. This book is one of the best-written books in this subject. We will follow the book very closely, any material, which is not covered in the book will be delivered by the instructor. Homework problems will be assigned from the book. The lectures will be tablet PC based and we will make use the interactive tablet PC server/software DyKnow, which will be introduced by Prof. Sahiner.

Exams/homework: There will be two hourly tests and a final exam. . Weekly homework will be assigned and graded as indicated below.

Attendance/Participation: Attendance is required for each lecture; class participation (questions/discussions) is strongly encouraged.

Final grade = Exam1-20% + Exam2-20% + Final-35% + HW-25%

The course will cover the following topics:

- Vector analysis.
- Differential calculus, (gradient, divergence, curl).
- Integral calculus (theorems for gradients, divergences, and curls)
- Cylindrical and spherical polar coordinates
- The Dirac Delta function
- The theory of vector fields
- Electrostatics and application of differential calculus on electrostatics.
 - Electric field
 - Electric potential
 - Poisson's Equation and La Place Equation
 - Electrical work and energy
 - Conductors

- Boundary value problems in electrostatics
- Dielectrics and polarization
 - Electric displacement ,
 - Electric permittivity
 - Electric susceptibility
 - Forces on dielectrics
- Magnetostatics
 - Magnetic fields
 - Magnetic forces
 - Ampere's Law
- Magnetism and matter
 - Ferromagnetism
 - Paramagnetism
 - Antiferromagnetism
- Electrodynamics
 - Faraday's Law
 - The induced electric field
 - Inductance
 - Maxwell's Equations
 - Maxwell Equations in dielectric media
 - Boundary conditions

Disability Services Statement

Students at Seton Hall University who have a physical, medical, learning or psychiatric disability, either temporary or permanent, may be eligible for reasonable accommodations at the University as per the Americans with Disabilities Act (ADA) and/or Section 504 of the Rehabilitation Act. In order to receive such accommodations, students must identify themselves at the Office of Disability Support Services (DSS), provide appropriate documentation and collaborate with the development of an accommodation plan. The DSS phone number is 973-313-6003. For further information, please go to our website at

<http://studentaffairs.shu.edu/health/DisabilitySupportServices.html>