

# PHY 301

## Electromagnetic Theory I

### Fall 2015

**Meeting Time and Place:**

Lecture: TuTh 10-11:20 ES131

**Instructor:**

Prof. Eden Figueroa A-104 Office hours: M  
eden.figueroa@stonybrook.edu 3:00-5:00pm

**Topics:**

Brief review of vector calculus  
Electrostatics: charge, field and potential  
Special techniques in electrostatics  
Electric field in dielectrics: polarization  
Magnetostatics: current, field and vector-potential  
Atoms and solids in magnetic field: magnetization  
Electrodynamics and Maxwell equations

**Textbooks::**

Introduction to Electrodynamics, by D. J. Griffiths (Prentice Hall, Fourth Edition)

**Grading:**

PHY301: HW 10%, Quizzes 20%, Midterm Exam 30%, Final Exam 30%, Experimental Project 10%

**Projects:**

Experimental/numerical/theoretical comparison of electrodynamics problem.

### Learning objectives

At the end of the term the student should have an understanding of the basic principles of the mathematical formulation of electrodynamics. The student should be able to solve problems using vector calculus regarding charge distributions and calculate their electric fields and potentials. Furthermore, the student should be comfortable calculating magnetic fields and vector-potentials based upon current distributions. Finally, the student should have a moderate understanding of Maxwell's formulation of electrodynamics.

### Schedule and assignments

(check Blackboard regularly)

HW is due in A-104 one week after it was assigned, and it will be graded. You may work together on solving the problems, but cannot hand in the same solutions. Solutions will be posted after the homework is collected.

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