

Physics 340

Electromagnetic Fields

Spring 2018

Course description: An advanced course in classical electric and magnetic fields — intended for Physics majors — that expands upon the topics introduced in Physics II. Electrostatics, magnetostatics, Laplace's equation, the method of images, and electric and magnetic fields in matter will be covered. Electrodynamics including electromotive force, Faraday's law, and Maxwell's equations will finish out the course.

Text: David J. Griffiths, *Introduction to Electrodynamics*, Fourth Edition, Prentice Hall, Upper Saddle River, New Jersey, 2014.

Instructor: Ted Clarke
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Office: Cooper-Wilson 115. Office hours will be announced in class.

Course objectives: To introduce the student to some of the fundamental ideas of electromagnetism.

Course content: Electrostatics
 Electric Field
 Electric Potential
 Work and Energy

Special Techniques
 Laplace's Equation
 Method of Images
 Separation of Variables

Electric Fields in Matter

Magnetostatics
 Lorentz Force
 Biot-Savart Law
 Magnetic Vector Potential

Magnetic Fields in Matter

Electrodynamics
 Electromotive Force
 Induction
 Maxwell's Equations

Grading:

Mid-Term Exam	25%			
Final Exam	25%			
Homework	40%			
Research Project	10%			
0-59 F	60-69 D	70-79 C	80-89 B	90-100 A

No make-up exams will be given without a verifiable medical excuse. Late homework will be accepted with an appropriate penalty. As a responsible student, you are expected to attend class. **I reserve the right to modify this syllabus as the course develops.**