Physics 421 – Electricity & Magnetism I
Spring 2009
TTh 10:45–12:00, LL 514

Instructor:

Ginny McSwain
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office hours: walk-in anytime or by appointment

Required Textbook:

J. D. Jackson, "Classical Electrodynamics', 3rd edition, John Wiley & Sons, 1998
In addition to the textbook, you may also find these books helpful:
Jackson, 1st or 2nd edition
Griffiths, "Introduction to Electrodynamics"

Grading:

Homework – 20%
Hour Exam 1 – 20%
Hour Exam 2 – 20%
Final Exam – 40%

Attendance is strongly recommended but not required. Every assignment must be turned in to receive a passing grade for the course. Late homework will be penalized by 10% per day late, without a valid excuse. If you have a valid excuse, we will agree upon a reasonable deadline to complete the work.

Academic Integrity:

I do not mind if you collaborate with other students or use outside references on homework assignments. There are many resources available to help you learn the material. However, copying work from other students or outside sources is considered plagiarism. Any student found to have engaged in academic misconduct on a graded assignment or exam may be assigned a zero for that assignment, assigned an F in the course, and/or reported to the Department of Physics.

Accommodations for Students With Disabilities:

If you have a disability for which you are or may be requesting accommodations, please contact both your instructor and the Office of Academic Support Services, University Center 212 (610-758-4152) as early as possible in the semester. You must have documentation from the Academic Support Services office before accommodations can be granted.

Tentative Schedule:

Jan. 13:	Introduction to vector calculus, Dirac delta function
Jan. 15:	Ch. 1 (Coulomb force, Electric field, Gauss's Law)
Jan. 20:	Ch. 1 (Scalar potential, Electric potential energy, Capacitance)
Jan. 22:	Ch. 1 (Boundary conditions at a charged surface, Green's functions)
Jan. 27:	Ch. 1 (Electrostatic energy); **Homework 1 due**
Jan. 29:	Ch. 2 (Method of image charges, Green's functions for plane)
Feb. 3:	Ch. 2 (Image charges for sphere)
Feb. 5:	Ch. 2 (Green's functions for sphere)
Feb. 10:	Ch. 2 (Orthogonal functions, Fourier series)
Feb. 12:	Ch. 2 (Laplace's equation in rect. coordinates) ; **Homework 2 due**
Feb. 17:	**Hour Exam 1**
Feb. 19:	Ch. 3 (Laplace's equation in spherical coordinates, Legendre polynomials)
Feb. 24:	Ch. 3 (Boundary value problems with azimuthal symmetry)
Feb. 26:	Ch. 3 (Spherical harmonics); **Homework 3 due**
Mar. 3:	Spring Break
Mar. 5:	Spring Break
Mar. 10:	Ch. 3 (Green's functions in spherical coordinates)
Mar. 12:	Ch. 3 (Laplace's equation in cylindrical coordinates)
Mar. 17:	Ch. 3 (Boundary value problems, cont.); **Homework 4 due**
Mar. 19:	Ch. 4 (Multipole expansion)
Mar. 24:	Ch. 4 (Multipole expansion, cont.)
Mar. 26:	Ch. 4 (Electrostatics in Medium)
Mar. 311:	Ch. 4 (Boundary value problems with dielectrics)
Apr. 2:	Ch. 4 (Electrostatic energy in dielectrics); **Homework 5 due**
Apr. 7:	**Hour Exam 2**
Apr. 9:	Ch. 5 (Magnetostatics, Biot-Savart Law)
Apr. 14:	Ch. 5 (Ampere's Law, Vector potential)
Apr. 16:	Ch. 5 (Magnetic moment, Localized current distribution)
Apr. 21:	Ch. 5 (Macroscopic equations of magnetostatics)
Apr. 23:	Ch. 5 (Boundary value problems, Faraday's Law); **Homework 6 due**
Date?	**Final Exam**

This syllabus is only a tentative outline of the course. The grading policy, dates of exams, or the topics covered in class may change as needed.