

PHYS 312 / ELEC 312 - Advanced Electromagnetism

Semester: Fall 2008
Lecture Hours: Tu, Th B5 – 15:30 – 16:45
Room: Eng. B11

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Off. Hr: We, B1 9:30 – 10:45 or by appointment

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Off. Hr: Fr, B5 – 15:30-16:45 in SCI 130

Course Description: Review of Maxwell's equations; conservation laws; electromagnetic waves; propagation of electromagnetic waves in conductors and dielectrics; transmission lines; waveguides; potentials and fields; radiation theory; electrodynamics and special theory of relativity.

Textbook: *Introduction to Electrodynamics* D. J. Griffiths (Prentice Hall, 3rd edition, 1999)

Grading: 1st Midterm 20 %, (to be announced)
2nd Midterm 20 %, (to be announced)
Homework 10 %
12 Quizzes 18% (1.5% per quiz)
Final 25% (to be announced)

Attendance Policy: If a student attends 90%-100% of the classes s/he obtains 7%, if a student attends 70%-90% of the classes s/he obtains 3.5%, if a student attends 50%-70% of the classes s/he obtains 1%.

Homework Policy: You may discuss the problems, consult your teachers and use the library and internet. However, the final submitted work should be totally yours. You must not submit work done in groups, transfer files or copy from a book.

Lecture Schedule:

Week	Subject	
1	15 Sep	Faraday's law. Maxwell's equations
2	22 Sep	Maxwell's equations. Boundary conditions
3	6 Oct	Conservation Laws
4	13 Oct	Waves in one dimension Polarization
5	20 Oct	Electromagnetic Waves in vacuum. Monochromatic plane waves
6	27 Oct	Electromagnetic Waves in matter. Reflection and transmission
7	3 Nov	Absorption and Dispersion
8	10 Nov	Overview, MT1
9	17 Nov	Guided waves. Transmission lines
10	24 Nov	Guided waves cont'd
11	1 Dec	Electromagnetic potentials. Gauge transformations
12	15 Dec	Electric and Magnetic dipole radiation
13	22 Dec	Dipole radiation cont'd, MT2
14	29 Dec	Special theory of relativity. Lorentz transformations
15	4 Jan	Space-time relativistic mechanics