PHYS 312 / ELEC 312 - Advanced Electromagnetism

Semester: Fall 2007
Instructor: Alper Kiraz
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Office Hours: Tu, B1 9:30 – 10:45 or by appointment
Lecture Hours: Mo, We B5 – 15:30 – 16:45
Room: Eng. B21

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 Plicy: 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 ont submit work done in groups, transfer files or copy from a book.

Lecture Schedule:

Week		**Subject**
1	Sep. 17	Faraday's law. Maxwell's equations
2	Sep. 24	Maxwell's equations. Boundary conditions
3	Oct. 1	Conservation Laws
4	Oct. 8	Waves in one dimension Polarization
5	Oct. 15	Electromagnetic Waves in vacuum. Monochromatic plane waves
6	Oct. 22	Electromagnetic Waves in matter. Reflection and transmission
7	Oct. 29	Absorption and Dispersion
8	Nov. 5	Overview, MT1
9	Nov. 12	Guided waves. Transmission lines
10	Nov. 19	Guided waves cont'd
11	Nov. 26	Electromagnetic potentials. Gauge transformations
12	Dec. 3	Electric and Magnetic dipole radiation
13	Dec. 10	Dipole radiation cont'd, MT2
14	Dec. 17	Special theory of relativity. Lorentz transformations
15	Dec. 24	Space-time relativistic mechanics