Physics 402 – Electromagnetic Theory Spring 2007

Instructor: Dr. Don Summers915-7032109 Lewis HallMWF 10:00-10:50summers@phy.olemiss.eduOffice: Lewis Hall Room 221Text: Introduction to Electrodynamics, GriffithsOffice Hours: TTh 2-33rd edition

	Date	Subject Read	These Chapters
17	Jan	Lorentz Force Law	5
19	Jan	Biot Savart Law	5
22	Jan	Ampere's Law	5
24	Jan	Vector Potential A	5
26	Jan	Poisson's equation	5
29	Jan	Dipole fields	5
31	Jan	Dia- Para-, Ferromagnets. Torque. Atomic Orbit	s 6
2	Feb	Bound Currents, H field	6
5	Feb	Ampere's Law with matter, Permeability	6
7	Feb	Electromotive Force	7
9	Feb	Ohm's Law	7
12	Feb	Faradays's Law, Inductance	7
14	Feb	Energy in B Fields	7
16	Feb	FIRST MIDTERM EXAM	
19	Feb	Maxwell's Equations, Boundary Conditions	7
21	Feb	Continuity Equation and Poynting Vector	8
23	Feb	Momentum	8
26	Feb	Maxwell's Stress Tensor, Conservation of p and	L 8
28	Feb	Electromagnetic Waves in One Dimension	9
2	Mar	Boundary Conditions	9
5	Mar	Polarization	9
7	Mar	Electromagnetic Waves in Vacuum/Matter	9
9	Mar	Absorption and Dispersion	9
19	Mar	Frequency vs. Permittivity	9
21	Mar	Wave Guides	9
23	Mar	SECOND MIDTERM EXAM	

26	Mar	Potential Formulation	10
28	Mar	Gauge Transformations	10
30	Mar	Retarded Potentials	10
2	Apr	Lefimenko's Equations	10
4	Apr	Lienard Wiechert Potentials	10
9	Apr	Fields of a Moving Charge	10
11	Apr	Dipole Radiation	11
13	Apr	Power Radiated by a Point Charge	11
16	Apr	Circular Motion and Radiation	11
18	Apr	Radiation Reaction	11
20	Apr	Special Theory of Relativity	12
23	Apr	Lorentz Transformations between frames of reference	12
25	Apr	Time Dilation and Length Contraction	12
27	Apr	Relativistic Mechanics	12
30	Apr	Relativistic Momentum and Energy	12
2	May	Magnetism as a Relativistic Phenomena	
4	May	Field Transformations & Tensor, Relativistic Potentials 12	
9	May	COMPREHENSIVE FINAL EXAM , 8:00 AM, Wednesday	

Grading: Homework 25% Term Paper 15% Midterms 30% Final 30%

Learning Objectives: Learn how to generate magnetic fields from currents Become proficient with Maxwell's equations. Propagate electromagnetic waves. Generate electromagnetic radiation. Calculate relativistic motion.