Physics 3323

Intermediate Electricity and Magnetism

Instructor: David Rubin Office hours: Tuesday 4:00-5:30 (or by appt.)

320 Physical Sciences Study Hall: Thursday, 4:00-6:00

255-3765 <u>dlr10@cornell.edu</u>

Course Web site: Blackboard: PHYS 3323 Intermediate Electricity&Magnetism Rubin, D.

Course structure: Lectures (Mandatory) MWF, Rockefeller 110, 11:15 - 12:05

Recitation (Quiz Mandatory) F, Clark 294A 1:25 - 2:15 Study Hall (Optional) Th, 301 PSB, 4:00-6:00

Homework and Quizzes: One problem set each week, available from blackboard each Wednesday, due at start of class the Friday following. Working together on the homework is encouraged, but the submitted work must comply with the Cornell Code of Academic Integrity. In particular: "A Cornell student's submission of work for academic credit indicates that the work is the student's own. All outside assistance should be acknowledged, and the student's academic position truthfully reported at all times..." Quizzes will be administered regularly in section, and will be drawn very closely, and often directly, from that week's homework.

<u>Study Hall</u>: An opportunity for you to work together to work through issues in HW that have you stumped. Attendance is optional. I will be available until \sim 5:15 to help the group should everyone be stuck. You will benefit from Study Hall most *if you have seriously attempted all problems in advance.*

Office Hours: Tuesday, 4:00-5:30, PSB 320

Texts:

- Required: Griffiths, David, "Introduction to Electrodynamics, 4th Ed.", Pearson
- Helpful References:
 - o Purcell: "Electricity and Magnetism, Berkeley Physics Course vol 2"
 - o Lorrain, Corson & Lorrain: "Electromagnetic Fields and Waves"
 - o Marion & Heald: "Classical Electromagnetic Radiation"
 - o Bekefi, "Electromagnetic Vibrations, Waves and Radiation"
 - o Feynman, Leighton & Sands, "The Feynman Lectures, Vol. 2"
 - o Reitz and Milford, "Foundations of Electromagnetic Theory"

<u>Reading</u> is an essential part of 3323. Reading the text before class is very important. Lecture is to clarify your understanding. I will assume you have done the required readings in advance. There will be online quizzes to test your comprehension.

iClicker will be used every lecture

Exams:

- Prelims: Friday, October 7 and Friday November 11, during recitation
- Final exam: to be determined

Grading:

•	Prelims (2@20%)	= 40%	
•	Final	=25%	
•	HW+quizzes	=25%	(Lowest quiz and HW scores will be dropped)
•	Participation	=5%	
•	Online reading quizze	s = 5%	

Tentative syllabus

Week(date)	Text (chapter)	Topic		
1 (8/24)	2	Coulomb and Gauss' Law, superposition, E field		
2 (8/29)	1,2	Vector calculus, potential		
3 (9/5)	2	Conductors, Poisson's Eq., Capacitance		
4 (9/12)	3	Laplace's Eq., Separation of variables, multipoles		
5 (9/19)	4	Electric fields in matter, polarization, dielectrics		
6 (9/26)	5	Magnetostatics, Lorentz force & Biot-Savart Law		
7 (10/3)	5	Magnetic vector potential,		
(10/7) [prelim 1]				
8 (10/10)	6	Magnetization, H field		
9 (10/17)	7	Ohm's law, electromotive force, inductance		
10(10/24)	7	Maxwell's equations, magnetic energy		
11(10/31)	8	Maxwell's equations, energy and momentum		
(11/4) [prelim 2]				
12(11/7)	9	Waves, waveguides, reflection, transmission		
13(11/14)	9	Waves and waveguides		
14(11/21)	9	Waves in matter		
15(11/28)	10	Potentials and Fields		