Physics 16: Honors Electricity and Magnetism

Winter 2013
Instructor: Marcelo Gleiser

Week 1	**No Lab**		
Jan	7	M	Electric charge; Coulomb's Law
	9	W	Energy of system of charges; the electric field
	11	F	Flux and Gauss's law: Applications
Week 2	**Lab 1: Coulomb's Law**		
	14	M	Apps. cont; energy of E field; Line int. of E field; Potential energy
	16	W	Gradient; Field from potential; Potential of charge distribution
	18	F	Potential of charge distribution cont.
Week 3	**Lab 2: Potential Plotting**		
	21	M	No class: Martin Luther King day
	23	W	Differential form of Gauss's law; divergence
X	24	Th	Conductors and insulators; Simple conductors
	25	F	Simple conductors cont.; Capacitors
Week 4	**No Lab**		
	28	M	Capacitors cont.; Potentials and charges; energy in capacitors
	30	W	Energy in capacitors cont.
Feb	1	F	Motion of charges in E and B fields (Read notes)
Week 5	**Lab 3: Electron Gun**		
	4	M	**Midterm Examination**
	6	W	Electric currents; Steady currents; Ohm's law
X	7	Th	Circuits; Energy dissipation in currents; Electromotive source
	8	F	Winter Carnival – no class
Week 6	**No Lab**		
	11	M	RC Circuits; Magnetic fields
	13	W	Magnetic fields cont.
X	14	Th	Differential form of Ampere's law; curls
	15	F	Vector potential; field of any current-carrying wire
Week 7	**Lab 4: Magnetic field mapping**		
	18	M	Faraday's induction; current loops
	20	W	More current loops
X	21	Th	Universal Law of Induction
	22	F	Mutual and self inductance
Week 8	**No Lab**		

	25	M	RL Circuits; Energy in B field [Damian]
	27	W	Maxwell's Equations and EM waves [Damian]
Mar	1	F	RLC Circuits [Damian]
Week 9	**Lab 5:**		**RLC Circuits**
	4	M	Fields of Moving Charges and Special Relativity (1)
	6	W	Fields of Moving Charges and Special Relativity (2)
X	7	Th	Blackbody Radiation (1)
	8	F	Blackbody Radiation (2)
March 11			**Final Examination at 3:00 p.m.**

Course Information

Textbook:	Purcell, Edward *Electricity and Magnetism, 2nd edition* Cambridge University Press, 2011. **There are 6 copies on reserve at Kresge**
Faculty	Marcelo Gleiser (116 Wilder) W 1:45-3:00
Teaching Assistants	Damian Sowinski - Labs (202 Wilder) F 1:00-3:00
Grader	
Lectures	MWF, 115 Wilder, 10:00-11:05 am.
X-Hours	Held on Thursdays, 12:00-12:50 am.
Course info site:	www.dartmouth.edu/~blackboard
Laboratories	5 labs, conducted in 2 sessions (Wilder 216) Mon 2-5, 7-10 pm
Examinations	The midterm (65 minutes) counts for 15% of your grade. The final (180 minutes), covering the entire course with greater emphasis on the latter half, counts for 25%. Weekly homework counts for 35% of your grade. Lab reports for 25%.
Lab Reports	Due 12 noon the **MONDAY** after lab activity at P16 lab return box (clearly marked down by front doors under students mailboxes) [penalty for late work: 10% of grade/day]
Homework	Given in class every Friday and due at 12 noon next **FRIDAY** at P16 homework box (main entrance hall).
Honor Principle	Adherence to the Honor Principle means that you will write your own exams (closed book) without assistance and write up the labs and term essay (if applicable) by yourself. The essay should be properly documented (see *Sources: Their Use and Acknowledgment*, 1998, http://www.dartmouth.edu/~sources). Otherwise, we encourage you to work together in the labs and in studying for the exams.

Special Situations	Students with disabilities, including "invisible" disabilities like chronic diseases or learning disabilities, are encouraged to speak with us so that appropriate accommodations can be arranged.