

**PHYSICS 153, Spring 2009**  
**ELECTRODYNAMICS**  
**SYLLABUS**  
(updated Jan 29, 2009)

**PROFESSOR**

Jenny Hoffman      jhoffman@physics.harvard.edu      Lyman 334      384-9487  
Office Hours: Tuesday 11:30am-12:30pm in Lyman 334;  
                         Thursday 8-9:30pm in Kirkland dining hall; or by appointment

**TEACHING FELLOWS**

Michael Gullans      gullans@physics.harvard.edu      Lyman 434      5-8383  
Office Hours: Thursday, 11:30am-12:30pm  
David Tempel      tempel@physics.harvard.edu      Lyman 5<sup>th</sup> floor  
Office Hours: Wednesday, 8-10pm in Leverett dining hall

**STAFF ASSISTANT**

Barbara Drauschke      drauschk@physics.harvard.edu      Jeff 348      495-4320  
Office Hours: Monday-Friday, 9am-5pm

**TEXTBOOK**

*Introduction to Electrodynamics, 3<sup>rd</sup> ed.*, by David Griffiths  
Prentice Hall 1999, ISBN 0-13-805326-X

**PREREQUISITES**

Mathematics 21a & b;  
Physics 15a, b, and c, or permission of Dave Morin or Prof. Georgi.

**LECTURES**

Tuesday and Thursday, 10-11:30am, Jefferson 356.

You are encouraged to read the textbook in advance and bring questions to the lectures. "Lectures" should be interactive conversations!

**SECTIONS**

Sections are taught by Michael Gullans and David Tempel.

Sections will be held on Tuesday/Wednesday afternoon/evening. Exact times and locations to be announced. Sections will begin the week of February 2. Attendance is strongly advised.

**WEBSITE**

Course website: <http://my.harvard.edu/icb/icb.do?keyword=k48421>  
Problem sets, solutions, labs, announcements, and other useful material will be posted on the web site. You are responsible for checking the website regularly.

**PROBLEM SETS**

There will be one problem set each week, due Friday at 4pm in the boxes outside Science Center 108-112. Solutions will be posted on the website as soon as problem sets are collected. Except in *very unusual* circumstances, we will not accept late problem sets. Any requests for extensions should be made to your TF, Michael or David.

Eleven problem sets will be given during the semester. The 11<sup>th</sup> problem set is optional and will be due during the Reading Period. If you do complete the 11<sup>th</sup> set, you may use it to replace your lowest score among the earlier problem sets.

## STUDY GROUPS

You are encouraged to work together on problem sets (but the work that you hand in should be your own, of course). The best way to find a study group is to attend office hours. If in doubt, please ask Michael or David for assistance finding a study group.

## EXAMS

There will be two midterm exams (during the regular 1.5-hour class) and a final exam (3 hours). The midterms will be on Thursday, March 12 and Thursday, April 23. The final will be either on Wednesday, May 14, OR Tuesday, May 20 (the registrar will eventually enlighten us).

## GRADING

Problem Sets 50% (for 10), Midterms 10% each, Final exam 30%.

## TENTATIVE SCHEDULE

Date	Lecture topic (subject to update...)	Reading	Homework
1/29 (Thu)	1 Math	Ch1	
2/3 (Tue)	2 Electric Field & Potential	Ch 2.1-4	#1, due 2/6 (Chapter 1)
2/5 (Thu)	3 Conductors	Ch 2.5	
2/10 (Tue)	4 Laplace's Equation	Ch 3.1-3	
2/12 (Thu)	5 Multipole Expansion	Ch 3.4	#2, due 2/13 (Chapter 2)
2/17 (Tue)	6 Polarization	Ch 4.1-2	#3, due 2/20 (Chapter 3)
2/19 (Thu)	7 Dielectrics	Ch 4.3-4	
2/24 (Tue)	8 Magnetostatics	Ch 5.1-2	#4, due 2/27 (Chapter 4)
2/26 (Thu)	9 Magnetic Vector Potential	Ch 5.3-4	
3/3 (Tue)	10 Magnetization	Ch 6.1-2	#5, due 3/6 (Chapter 5)
3/5 (Thu)	11 Diamagnetism, Paramagnetism, etc.	Ch 6.3-4	
3/10 (Tue)	12 midterm review		
3/12 (Thu)	<b>MIDTERM (through Ch 5)</b>		
3/17 (Tue)	13 Maxwell's Equations	Ch 7	#6, due 3/20 (Chapter 6)
3/19 (Thu)	14 Energy & Momentum	Ch 8	
3/24 (Tue)	<b>SPRING BREAK</b>		
3/26 (Thu)	<b>SPRING BREAK</b>		
3/31 (Tue)	15 EM Waves in Insulators	Ch 9.1-3	#7, due 4/3 (Chapter 7&8)
4/2 (Thu)	16 EM Waves in Conductors	Ch 9.4-5	
4/7 (Tue)	17 Potentials & Fields	Ch 10	#8, due 4/10 (Chapter 9)
4/9 (Thu)	18 Dipole Radiation	Ch 11.1	
4/14 (Tue)	19 Radiation from a Point Charge	Ch 11.2	#9, due 4/17 (Chapter 10)
4/16 (Thu)	20 Special Relativity	Ch 12.1-2	
4/21 (Tue)	21 midterm review		
4/23 (Thu)	<b>MIDTERM (through Ch 10)</b>		
4/28 (Tue)	22 Relativistic Electrodynamics	Ch 12.3	#10, due 5/1 (Chapter 11)
4/30 (Thu)	23 Interesting Applications		
5/5 (Tue)	<b>reading period</b>		#11, due 5/8 (Chapter 12)
5/7 (Thu)	<b>reading period</b>		
5/12 (Tue)	<b>reading period</b>		
5/14 (Wed)	<b>MAYBE FINAL EXAM</b>		
5/20 (Tue)	<b>MAYBE FINAL EXAM</b>		