

**PHYSICS 350**  
**Electricity and Magnetism**  
**Davidson College**  
**Spring 2009**

**Professor John Yukich**  
Email: [joyukich@davidson.edu](mailto:joyukich@ davidson.edu)

**Dana 169**  
TEL: (704) 894-2323

**TEXT:** Electromagnetism, Pollack and Stump, 1<sup>st</sup> ed, Addison-Wesley.

**PREREQUISITES:** Physics 330 or consent of instructor.

**LECTURE:** Tues/Thurs 10:00 -11:15 AM, Dana 153

**OFFICE HOURS:** will be posted on my webpage; however, I will generally be available any time my door is open.

**OBJECTIVES:** This course will address the major topics in the very broad physics subfield of electricity and magnetism. Topics will include electric fields and potentials, conductors, dielectrics, magnetostatics, induction, Maxwell's equations and electromagnetism. Attention will be given to proper mathematical treatment of these topics, including extensive use of vector calculus. Whenever possible, connections will be made in lecture to applications in such areas as optics, quantum mechanics and atomic physics.

**ATTENDANCE:** You are expected to attend each class unless you have a legitimate reason for being absent. In this case, please see me in advance (except in the case of illness). *You are also expected to attend all department seminars!*

**ASSIGNMENTS:** There will be regular assignments of problem sets taken from the textbook. These assignments, and their solution keys, will be posted on the course web page. I urge you to work together on the assignments as much as possible. However, each student's work turned in for grading must be a product of that individual student's understanding of the material; i.e., *you may not copy work from another student in this class or any previous class, or any book, website, or other external resource. Copying any solution other than those found in your textbook or discussed during office hours is an honor code violation.*

**GRADING:** Homework assignments 40%, reviews 35%, final exam 25%. The two reviews will each be a combination of take-home and in-class, time-limited, closed-book tests. The final will be a comprehensive, take-home, time-limited, closed-book examination taken during final exam week.

<b>WEEK OF</b>	<b>TOPICS</b>	<b>CH</b>
Jan. 12 – Jan. 16	Introduction and vector calculus, vector operators	1 & 2
Jan. 19 – Jan. 23	Vector calculus, integral theorems, coordinate systems	2
Jan. 26 – Jan. 30	Electrostatics – fields and potentials	2 & 3
Feb. 2 – Feb. 6	Electrostatics – Gauss’s law	3
Feb. 9– Feb. 13	Electrostatics, multipole expansion, and conductors	3 & 4
Feb. 16 – Feb. 20	Conductors, Laplace’s equation	4 & 5
Feb. 23 – Feb. 27	<b>Review #1</b> , Laplace’s, Dielectrics - dipoles	5 & 6
Mar. 2 – Mar. 6	Spring Break! No classes.	
Mar. 9 – Mar. 13	Dielectrics, capacitors	6
Mar. 16 – Mar. 20	Dielectrics, magnetostatics – magnetic forces	6 & 8
Mar. 23 – Mar. 27	Magnetostatics – Ampere’s law	8
Mar. 30 – Apr. 3	Magnetostatics – magnetic dipole, B fields in matter	8,9
Apr. 6– Apr. 10	Magnetic fields in matter	9
Apr. 13 – Apr. 17	(No class April 14 – Easter) <b>Review #2</b> , Induction	10
Apr. 20 – Apr. 24	Induction	10
Apr. 27 – May 1	Maxwell and electromagnetism	11
May 4 – May 6	Maxwell and electromagnetism	11
May 8	Finals begin	

N.B.: The above outline is a *rough approximation* of the schedule. Adjustments may be necessary, but I will give ample advance notice before changes are made.