

# Introduction to Electromagnetism

171.301 Fall 2006

**Course Description:** The fall semester provides a thorough introduction to electrostatics, magnetostatics and electrodynamics. Practical examples and some demonstration experiments will be used to connect the elegant mathematical theory of electromagnetism with physical intuition.

**Instructor:** Professor David Kaplan  
Office hours: Monday 1-3 pm in room 455 and by appointment.  
Questions are also answered by e-mail (dkaplan@pha.jhu.edu).

**Teaching Assistant:** Eun-Jung Rhee  
Office hours: Monday 1-3 pm in room 465 and by appointment.  
E-mail: ejrhee@pha.jhu.edu; phone 410-516-0461

**Textbook:** “Introduction to Electrodynamics” by David J. Griffiths (3rd Ed.). An excellent introduction to the subject that I think you will enjoy. We will cover chapters 1-7 in the fall semester.

**Supplementary Literature:** “Classical Electrodynamics by J. D. Jackson. This is a rigorous graduate level text book. Complete and with many challenging problems.

**Lectures:** MTW 11-11:50 pm in room 276.

We will go over new concepts and provide examples that help you solve the upcoming problem assignments. Read the assigned text in advance, especially the examples. Read again afterwards and do some problems for optimal comprehension. Active participation in the lectures with questions and comments is strongly encouraged. On some occasions the lecture and conference may be switched for scheduling reasons. This will be announced in class the week before.

**Conference:** Th. 12-12:50 pm in room 361.

Conferences focus on improving your problem solving skills. They are also a good opportunity to ask questions.

**Homework:** Solving problems is how you learn physics. The weekly assignment will be due at class on tuesdays. Late homework will not be accepted. However, your homework assignment with the lowest score will not be included in your final homework grade. You will get homework back at conference on thursdays. Assignments will also be posted on the course webpage

([http://www.pha.jhu.edu/courses/2006\\_fall/171.301/](http://www.pha.jhu.edu/courses/2006_fall/171.301/))

**Ethics:**

University Policy: *The strength of the university depends on academic and personal integrity. In this course, you must be honest and truthful. Ethical violations include cheating*

*on exams, plagiarism, reuse of assignments, improper use of the Internet and electronic devices, unauthorized collaboration, alteration of graded assignments, forgery and falsification, lying, facilitating academic dishonesty, and unfair competition.*

In addition, the specific ethics guidelines for this course are:

(1.) Homework assignments: It is the opportunity to test yourself how well you understand the material and solve related problems independently. So it is important that you pursue it independently. You may discuss with fellow classmates occasionally on some problems in general. But once you start to lay it out, you are expected to do it independently. If you do not work out the details on your own, I guarantee that it will be extremely difficult to pass the exams.

(2.) Exams: All exams are expected to be done close book without any notes, except material provided by the instructor.

**Grading:**

Homework: 40%

Midterm: 20%

Final Exam: 40%

Dates	Topic	Reading	HW	HW Due
9/11-13	Ch. 1 Vector Analysis	pp 1-28	1	9/19
9/18-20	Ch. 1 Vector Analysis	pp 29-57	2	9/26
9/25-27	Ch. 2 Electrostatics	pp 58-83	3	10/3
10/2-4	Ch. 2 Electrostatics	pp 84-109	4	10/10
10/9-11	Ch. 3 Special Techniques	pp 110-145	5	10/17
10/17-18	Ch. 3 Special Techniques	pp 146-159	6	10/24
10/23-25	Ch. 4 E Fields in Matter	pp 160-185	7	10/31
10/30	Ch. 4 Midterm Exam (Ch. 1-3)	pp 1-159		
10/31-11/1	Ch 4-5 E Field in Mat. & Mag	pp 186-209	8	11/7
11/6-8	Ch. 5 Magnetostatics	pp 210-237	9	11/14
11/13-15	Ch. 5-6 Magneto & Mag Materials	pp 238-262	10	11/21
11/20-22	Ch. 6 Magnetic Materials	pp 263-284	11	11/28
11/27-29	Ch. 7 Electrodynamics	pp 285-314	12	12/5
12/4-6	Ch. 7 Electrodynamics	pp 315-344	13	12/11
12/11	Course Review (Ch. 1-7)	pp 1-344		
12/19	Final Exam (Ch. 1-7)	pp1-344		