Electricity and Magnetism – Physics 352
Spring 2013
Westminster College

1 Pertinent Information

Instructor: Douglas Armstead
Office: 124 Hoyt (724) 946-7201
Office Hours: MWF 10:00-11:00. These are just the times I guarantee. I am available other times so feel free to drop by or to email me for an appointment.
Email: armstedn@westminster.edu
Course website: www.westminster.edu/staff/armstedn/S13/EM.html
Lecture meets: MWF 12:50pm in Hoyt Planetarium.
Text: *Introduction to Electrodynamics* 4^{th} *Ed.* by David Griffiths published by Pearson.
Prerequisites: Physics 152 is a prerequisite and Math 251 is needed at least concurrently.

2 The Point of this Class [1]

In Physics 152 you became familiar with the behavior of electric and magnetic fields in a vacuum, culminating in the integral form of Maxwell's equations. In this course you will deepen the sophistication with which you approach electrodynamics. Some of this will come from being able to apply mathematical tools such calculus on vector fields, differential equations, symbolic solvers, and numerical integration in your problem solving. This sophistication will also come from analyzing the behavior of electric and magnetic fields in materials, a more careful analysis of electromagnetic waves, and the radiation of those waves.

3 Expectations

What you should expect from me:

- Explanations of physical concepts that include concrete examples and, where reasonable, demonstrations.

[1] If you are looking for the outcomes of this course, they are here. This course's effectiveness will be assessed by monitoring the quality of the student's work on the graded elements of this course. See Graded Elements section for their descriptions.

- In-class examples that help you to develop the level of reasoning that is necessary to do the problems you will encounter in the homework and on exams.
- Careful and respectful consideration of your questions.
- An open door policy–if my office door is open you should feel free to come in and talk about physics. This is in addition to my regularly scheduled office hours listed above.

What I expect of you:

- Your presence in class, both physical and mental, for the entire class period.
- To prepare for class. This includes doing the reading at a level that you arrive with questions in hand about the material.
- When you have a question, ask it. Your fellow classmates will thank you–if you are unclear on something, chances are the person next to you is, too.
- Submit work for grading that is your own. If you copy from another student or source and submit it for a grade, then you risk receiving an F in the course.

4 Grades

The final score for the class is found in the following way:

$$score = \frac{H + E_1 + E_2 + F}{4} \tag{1}$$

where H =homework average, $E_i = i$th midterm exam, and F =final exam.

4.1 Graded Elements

The point of the homework in this course is for developing the ability to apply the modes of thinking that are the core of this course. This entails mastering the concept, technique, and thought process that leads from beginning to end using a clear, methodical plan. It is essential that you be able to both tell the story explaining why your analysis is relevant, and to perform the analysis. There are many aids at your disposal: the instructor, in and out of class; your classmates; and the library. But in the end no of these aids removes the need for quiet concentration and taking the time needed to gradually sorting things out for yourself.

Your goal in solving the homework is to demonstrate and express the logic that leads to the answer, not simply finding a number. Note that expressing the logic requires telling the story that holds the framework within which the story makes sense. I will look for the framework, the logic, and the calculation when evaluating the homeworks. Solutions for all homework problems will be made available. I will sample your solutions to problem sets when I grade them, that is some questions will be graded in their enirety, other problems on a 0/1/2 scale for degree of completeness.

Exams will have an in-class format. Here too, I will look for the framework, the logic, and the calculation when evaluating your work. Make-up exams will only be administered for "Excused Absences" (see pages 70-71 of Undergraduate Catalog for details). Supporting documentation to excuse your absence will be required.

The score is mapped into a grade roughly as:

Final %	Grade
90-91,92-100	A- to A
80-81,82-86,87-89	B- to B+
70-71,72-76,77-79	C- to C+ etc.

Improvement and class participation may be used raise a border line grade.

4.2 Academic Integrity

You are expected to observe the College's statements and procedures on Academic Integrity in the 2012-2013 Undergraduate Catalog, pages 73-78. Ask the instructor if you have any uncertainty about what is proper collaboration and what is not.

5 Class Schedule

All dates are tentative.

Week	Chapter(s)	Topic
1-3	Griffiths 2 with 1 as needed,	Electrostatics
3-5	Griffiths 3	Electric potentials
5-6	Griffiths 4	Electric fields in matter
7	Griffiths 5	Matnetostatics
		Test:Chapters 2-4 (3/1)
		Spring Break
8	Griffiths 5 & 6	Matnetostatics and Magnetic fields in matter
9	Griffiths 6	Magnetic fields in matter
9-11	Griffiths 7	Electrodynamics
		Easter Break
11-13	Griffiths 9	Electromagnetic Waves
		Test: Chapters 5-7 (4/15)
		URAC instead of class (4/24)
14	Griffiths 11	Radiation

Final Exam from 8-10:30am on Thursday May 9, 2013