Physics 352: Electromagnetic Theory  
Spring 2019

Dr. Thomas E. Oberst  
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Office Hours: M 11:30 AM – 12:30 PM, W 12:50 – 1:50 PM, or by appointment

Meeting Time and Location: TR, 2:00 – 3:30 p.m., HSC 119

Text: Introduction to Electrodynamics, 4th ed., Griffiths

Prerequisites: PHY 152 & MTH 250

Expectations and Assessment:
1. To learn the basics of vector calculus and electrodynamics as needed for: (a) further advanced study in undergraduate physics, (b) the Physics GRE, (c) graduate coursework at the level of Classical Electrodynamics by Jackson, (d) teaching high school physics, or (e) an entry-level physics-related job in industry or government.
2. To develop and improve public presentation skills of technical material in a peer-review setting. Such skills are crucial in most science-based careers.
3. To find joy and amazement in learning how the Universe works!

Grade Allocation

<table>
<thead>
<tr>
<th>Category</th>
<th>Percentage</th>
<th>Letter Grade Assignments</th>
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<tbody>
<tr>
<td>Pre-class (“warm-up”) problems</td>
<td>5 %</td>
<td>A  93 – 100 %   C+  77 – 80</td>
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<tr>
<td>In-class (“interactive”) problems</td>
<td>5</td>
<td>A-  90 – 93   C   73 – 77</td>
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<tr>
<td>Post-class (“homework”) problems</td>
<td>40</td>
<td>B+  87 – 90   C-  70 – 73</td>
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<tr>
<td>Exams</td>
<td>50</td>
<td>B  83 – 87    D   60 – 70</td>
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<td></td>
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<td>B-  80 – 83   F   0 – 60</td>
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Missed or late components will be graded as zero percent, except in cases where a College-approved excuse is provided by the student in advance.

Pre-class (“warm-up”) problems
For each chapter you will be assigned a set of pre-class “warm-up” problems. The problems are designed so that you arrive at lecture already somewhat familiar with the material. Grading will be performed using a modified pass-fail system: each problem will be graded as either 1 point (mostly correct), ½ points (partially correct), or 0 points (mostly incorrect). Your answers are due via Email by midnight the night before the first lecture on each chapter.

In-class (“interactive”) problems
You learn best by doing, not by listening. Therefore, we will take periodic breaks during lecture to solve in-class “interactive” problems. These may involve both individual and group work. You will be graded for participation only, not for the correct answer.
Post-class ("homework") problems

For each chapter you will be assigned a set of homework problems from your textbook. Rather than preparing written solutions for your instructor, you will prepare a presentation for your classmates. A PPT format file is due via Email by midnight the night before the presentations so that your instructor has time to download and queue them. The next day, students will be called upon at random to stand up and present the homework solutions. Each student can expect to present one or two problems per chapter – you just won’t know which ones in advance. Each problem should last 5-10 minutes, including a few minutes for questions, feedback, and group discussion, as necessary. To constrain the time, you will need to decide which aspects of a problem are the most important – such as set-up choices or tricky mathematical manipulations – and which aspects to skim over – such as prosaic algebra.

This unique format has the following objectives:
- Emphasizes understanding of problems, rather than just completeness
- Encourages group work, since students are not primarily graded on individual solutions
- Provides an opportunity for immediate instructor feedback and group discussion
- Simulates seminar and peer review forums, commonplace in most science careers
- Trains presentation and public speaking skills, often omitted from science curricula

Your homework grade will depend on your demonstrated understanding of the solutions to the problems you are called on to present (30 %), your presentation effectiveness (15 %), your participation in group discussion following presentations by your peers (5 %), and, finally, your written/presentation slide solutions to all the problems (50 %). Presentation skills will be discussed before the first homework presentation and reviewed periodically throughout the semester, as needed. View this as a friendly environment to practice presentation and speaking skills that you will need later in your career.

Exams

The majority of your grade will depend on your ability to solve problems on timed in-class exams. You may bring your own equation “cheat sheet.” Otherwise, only a pencil and stand-alone calculator are permitted. Calculator apps on WIFI-capable mobile devices are not permitted. Exam questions will be similar to the in-class and homework problems.

Policies and Procedures:
- This course will follow the policies and procedures on academic integrity as defined in the Westminster College Student Handbook. In short, make sure your exams represent your own work, and that you are making equal contributions to in-class and homework problems when you work on these in a group.
- On-time attendance is expected.
- Please put away mobile devices unless they are being used for class purposes.
- I am committed to helping students overcome any curricular barriers that may exist. Please come talk to me. The Westminster Office of Disability Resources may also be of help.