Introduction
Welcome to Physics 1212! This course is the second half of a two-semester introductory sequence. This semester we’ll focus on electromagnetism, one of the four fundamental forces of nature. The understanding of electric, magnetic, and optical phenomena as different aspects of the same underlying force was a crowning achievement of 19th century physics. Without this understanding, our modern electronic world wouldn’t be possible.

Objectives
As with last semester, the primary objective of this course is to engage you in a process that is central to physics: Modeling physical phenomena by applying a small set of fundamental principles. The modeling process encompasses explaining and predicting physical behaviors; making appropriate approximations and simplifications for complicated physical systems; and communicating results through mathematical and numerical expressions, diagrams and visualizations, graphs, and even “plain English.”

The ordering of topics this semester will be different from the traditional sequence. We’ll start with optics, the study of light and how it interacts with matter. You will then learn about electric fields and electric potential. You will see how to apply those concepts to study electric circuits and currents (moving charges). Next we’ll discuss the magnetic field, and how electric and magnetic fields interact with each other.

Prerequisites
Some differential and integral calculus will be used in the course. It is important that you be registered for the second semester of the calculus sequence (Math 2260 or equivalent), if you haven’t already taken it. In order to do well in this course, you should also have a solid working knowledge of college algebra, trigonometry, and plane geometry. A prior high school physics course is useful, but not required.

This course will continue to make use of the fundamental principles that you learned to work with in first-semester physics (forces, momentum, energy). Prepare to review that material if you’re feeling rusty!

Basic Information
Instructor: HBSchüttler Email: hbs@physast.uga.edu
Office: 313 Physics Building Phone: 706-542-3886
Class: Tu., Th. Period 2 (9:30–10:45am) 202 Physics Building
Final Exam: Tu., 5 May, 8:00–11:00 am, 202 Physics Building
Office hours: TBA
Course Resources

Required Materials
- A Turning Technologies ResponseCard NXT (“clicker”). Bring it to every class; we will be using clickers throughout the semester for participatory activities.
- A scientific calculator. A simple calculator such as the TI-30X series will do just fine, but a fancier graphing calculator is also acceptable.

Online Resources
- Your UGA email account will be subscribed to a low-volume announcement list. It is your responsibility to be informed of all announcements sent via this email list: check your UGA email daily!
- The eLearning Commons will serve as another repository of course information, esp. for exam grades, at http://www.elc.uga.edu/.
- Online assignments are an essential part of the course. You’ll complete this work on the LON-CAPA homework system at https://spock.physast.uga.edu/. Occasionally, written hardcopy (paper) homework may also be assigned which you will need to hand in in class.
- Additional practice problems and solutions may be posted on the PHYS 1212 course web site at http://www.physast.uga.edu/classes/phys1212/schuttler/

Other Resources
- Office hours are your chance to get one-on-one or small-group help with homework assignments or with understanding topics from class. Please make use of this time; I can’t address your questions if you don’t ask!
- If you can’t come to my regular office hours, or need additional help, please set up an appointment (by email, by phone, or in person) to see me outside of class.
- Tutors are available either through the UGA Tutoring Program at Milledge Hall, or through the Department of Physics and Astronomy.

Grading Policy and Assignments
Your overall grade will be determined from your course performance, weighted as follows:
- 20% Cumulative final exam grade
- 45% Three in-class exams (20%/15%/10% for highest/middle/lowest grades)
- 15% Homework grade
- 15% Laboratory grade (including lab final worth 30% of total)
- 5% In-class participation

Letter grades will be assigned from your overall numerical grade according to the following:

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<tr>
<th>Grade Letter</th>
<th>Numerical Grade</th>
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<tbody>
<tr>
<td>A</td>
<td>90.0</td>
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<tr>
<td>A–</td>
<td>87.5</td>
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<tr>
<td>B+</td>
<td>85.0</td>
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<tr>
<td>B</td>
<td>80.0</td>
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<tr>
<td>B–</td>
<td>78.5</td>
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<tr>
<td>C+</td>
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<td>C</td>
<td>70.0</td>
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<td>C–</td>
<td>67.5</td>
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<td>D</td>
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<td>F</td>
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Overall numerical grades will *not* be rounded (i.e., 89.99 is still an A–).
Any requests for a regrade of an assignment or exam must be made no later than one week after it’s returned. For a regrade I will look at the entire assignment/exam, not just one problem, and this may raise or lower your score. Regrade requests (including those for online homework) should be accompanied by all your work.

Like any other measurement, grades possess a degree of uncertainty. Factors such as improvement, effort, and participation may help borderline grades. Lobbying, however, will not, and requests for extra credit will be ignored, so don’t ask!

**Exams**

All exams will be closed-book and closed-notes. You may use a scientific calculator *for arithmetic only*, not for algebra, calculus, or graphing; all memory and programs must be cleared. I’ll provide you with a formula sheet for each exam, and will also post it to the Web before the exam. The formula sheet’s purpose is to focus your study on understanding rather than memorizing.

Exams will comprise both conceptual and problem-solving questions, similar to homework, practice problems, and in-class examples. Unless told otherwise, you must show your work on each problem in order to receive full credit. Partial credit is awarded (based on your work) for incomplete or incorrect answers, so it is usually in your best interest to attempt every problem. Detailed solutions will be posted to the Web after each in-class exam.

Exams are designed to test your understanding thoroughly and to distinguish among levels of performance. In order for exams to be effective assessments, raw scores will often be lower than the expectations created by the “standard” letter grade cutoffs. These raw scores will be “rescaled” into numerical grades. This conversion is based mostly on the difficulty level of the exam and partly on the distribution of raw scores. Your rescaled grade will *never* be lower than your raw score. Also, unlike a “grade curve”, you are not competing against your peers; it is possible for everyone to get an A or B, for example.

*There will be no make-up midterm exams.* If you need to miss a midterm exam for a *serious, documentable* reason, your final exam grade will be substituted for your missed midterms grade(s), making your final exam worth at least 30-40% of your overall grade (depending on how this grade compares to your other midterm exam grades). This policy is designed to handle unavoidable situations like medical or family emergencies, or previously scheduled academic or athletic events. You *must* contact me as soon as you know of the conflict (before the exam if at all possible), and you must provide sufficient documentation in a timely fashion. (An example of *unacceptable* documentation is a note stating only that you visited the health center, with no indication of the severity and nature of your illness.) Do not presume that your situation or documentation merits an excused absence; that determination is not your prerogative. *Unexcused exam absences will result in an exam grade of zero.*

A make-up final exam will be given only for legitimate, documentable reasons as explained above.

**Homework**

Sustained practice with physics problems is crucial to understanding physics, so you will have regular homework assignments. Assignments will be posted online through LON-CAPA
and/or smartPhysics, and most problems will require you to submit your answers online. However, a few assignments may also have a handwritten component. Detailed solutions will be posted to the Web after the due date.

Assignments will be weighted equally unless otherwise specified. At the end of the semester, provided that you complete a course evaluation, I will drop your lowest two assignment percentages in calculating your overall score. (If you don’t submit a course evaluation during the allotted time, then none of your assignments will be dropped.) This dropped-assignment policy compensates for the unavoidable circumstances that may occasionally prevent you from submitting homework on time (e.g., illness, scheduled event, Internet failure, etc.). Late homework won’t be accepted or excused. However, even if you miss the deadline to submit homework answers for credit, you should still make every effort to work through all the problems on every assignment, in order to master the topics covered. You will likely do very poorly on exams if you don’t work through each assignment in its entirety.

Teamwork is an effective way to learn, so I encourage you to collaborate with your classmates. Ask them questions; critique others’ work; explain your reasoning to your study partners. However, don’t mistake teamwork for plagiarism. You’re responsible for understanding all the details of every solution, and your solutions must be your own. Copying from any source of homework solutions is a violation of academic honesty policies. Since you can’t collaborate on exams, homework is your best opportunity to develop your own problem-solving skills.

Labs
Please consult the lab syllabus which is also posted on the Department’s course web page at http://www.physast.uga.edu/courses.

In-Class Activities
You will often be asked in class to answer conceptual questions using the “clickers”. These activities allow you to demonstrate your sincere effort and active class engagement.

A fraction of these in-class activity scores will be “dropped” (similar to the fraction of dropped homework assignments) to compensate for the occasional absence, clicker malfunction, or similar issue. I will not accept a written record of your responses as a clicker substitute, or otherwise excuse any absence from class.

Academic Honesty
UGA has a comprehensive academic honesty policy document, A Culture of Honesty, which is available from Office of the Vice President for Instruction at http://ovpi.uga.edu/academic-honesty/academic-honesty-policy. This policy covers all academic work.

As a UGA student, you are responsible for knowing and understanding this policy. If you have any question about the appropriateness of your actions or your work, you are obligated to ask me for clarification.

I take the issue of academic honesty very seriously, and it is my responsibility to uphold the University’s policy. This means, among other things, that I won’t hesitate to report
my suspicions of dishonesty to the Office of the Vice President for Instruction. Typical consequences of cheating on homework or an exam range from receiving a zero for that grade, to failing the course.

**Student Responsibilities**

- **Above all**, you have the right to expect courtesy from your fellow students, and the same will be asked of you. Courtesy includes the expectation that everyone will come to class ready and willing to learn and to interact, and able to ask or answer questions freely. Courtesy also implies that you arrive on time and stay until the end of class.

- **Attendance is required.** Class attendance keeps you well connected to the course and to the members of your group. In physics courses, each new concept builds on earlier ones, so mastering key concepts is critical. If your schedule makes it difficult to attend class regularly and on-time, you shouldn’t take this course.

  The most common causes of missed classes are lack of sleep and time pressure from other obligations. If this happens to you, you need to seek out advice on how to set priorities and manage your time effectively.

  If you miss class, it’s your responsibility to find out what you missed. Talk to your groupmates, and notify them of your absence in advance if possible. They’re relying on you to be caught up by the time you return to class.

- You **must** prepare for class. Class time is valuable and limited. Using that time effectively requires that you’ve had some exposure to the necessary concepts, so that you can ask good questions and practice applying those concepts in class. Evidence from other courses with this format suggests that the time you spend preparing for class significantly reduces the amount of time needed for homework. Finally, *class discussion will not cover all of the assigned material.*

- I can’t emphasize enough the importance of homework! Just as with other areas of learning, your physics problem-solving skills will improve only by practicing regularly and conscientiously. You’ll get very little value out of homework if you procrastinate, or if you depend on the efforts of others. If you start to get behind, get help early before the problem gets worse!

- Ask for clarification on anything you find unclear, ambiguous, or unspecified. This includes both course policies and physics topics. Ignorance is never a valid excuse.

- Know the policies **concerning withdrawals and incompletes.** The following passages are particularly important:

  Undergraduate students are limited to four course withdrawal-passing (WP) grades during their enrollment at UGA. . . . A student who wishes to withdraw from a course after the last day of the drop period for a term must withdraw through Athena. . . . An instructor may withdraw a student from a course due to excessive absences as defined in the course syllabus.

  For withdrawals before the midpoint, I will enter a grade of WP even for technically failing grades, *if* I judge that you have made a sincere, significant effort in the class. *It is possible to earn a grade of WF before the midpoint;* don’t assume otherwise!
If you don’t complete the initial required administrative tasks of the course (e.g., the questionnaire), or are demonstrably not attending class and completing work, you may be withdrawn from the class for “excessive absence”—probably with a WF.