PHYS 1112 Syllabus
University of Georgia, Spring 2010
http://www.physast.uga.edu/classes/phys1112/schuttler

Introduction
Welcome to Physics 1112. 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.

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. With any time remaining, we may touch on topics in modern physics.

As you know from your first semester of physics, this is a quantitative science. We won’t neglect the qualitative and conceptual aspects of electromagnetism, but much of the work in this course will involve setting up and solving math problems. You’ll need to be able to communicate your results in a variety of ways—mathematical and numerical expressions, diagrams and graphs, and even “plain English.” By now you should be comfortable with using algebra, geometry, and trigonometry in the context of physics, and well-acquainted with basic concepts such as units and dimensions, scientific notation, and significant figures.

Keep in mind that physics subjects are grounded in basic and widely-applicable principles. Mechanics concepts like force, energy, and torque will reappear in this course, and you will continue to make use of Newton’s Laws, the conservation laws, and their applications (e.g., wave motion). If you don’t feel comfortable with your background in mathematics or mechanics, please come see me.

If you are a physics or astronomy major, or if you’re considering those possibilities, then this course is probably not for you. Please talk to Prof. Wiegert (physics) or Prof. Caillault (astronomy) for help in exploring your options.

Basic Information
Instructor: HB Schüttler Email: hbs@physast.uga.edu
Office: 313 Physics Building Phone: 542-3886
Class: Tu/Th Period 2 (9:30am–11:45am), 202 Physics Building
        Tu/Th Period 3 (11:00am–12:15pm), 202 Physics Building
Lab: Various times, 319 Physics Building
Final Exam: Wed 5 May, 7:00pm–10:00 pm, location: T.B.A.
Office Hrs/HW Clinic: Mon or Tue or Thu 5:30–6:30 pm (T.B.A., Rm 202, optional)
Required Course Materials

- *Physics, Volume 2*, 3rd or 4th ed., by J. S. Walker (Pearson Prentice Hall). The 3rd is the “blue cover” edition. You may also use older editions (white or red covers) if you wish, but you are responsible for knowing about any changes in content.

- *Experiments for an Introductory Physics Course*, 6th ed., by R. M. Wood and S. P. Lewis. This is the same lab manual from the first semester of physics (PHYS1111/1211), and will be used in your lab section.

- An Interwrite PRS RF response pad (the “clickers”). Bring this to every class; we will be using them throughout the semester for in-class quizzes, starting with our 3rd lecture. Check to make sure you have a fully charged battery for every lecture. Make sure to become thoroughly familiar with its operation; and especially how to set up your UGA MyID (not your UGA 810 ID-number!) as your clicker ID: see Homework Problem Set #00. If your clicker ID is not set up as your UGA MyID you will get zero credit for the quizz questions answered with your clicker. Also, you must not share your own clicker with any other student(s) in any PHYS1112 section; else you and the other student(s) will get zero credit for the quizz questions answered with your clicker: One Woman/Man, One Clicker!!

- A simple scientific calculator for exams, which must be non-programmable, non-graphing, and non-symbolic. Examples of acceptable calculators include the TI-30X series or the Sharp EL-531. The use of calculator graphing, algebra-solving, or programming functions will not be permitted for any exam, nor will PDAs, cellphones, etc.

Online Course Resources

- The course Website at [http://www.physast.uga.edu/classes/phys1112/schuttler](http://www.physast.uga.edu/classes/phys1112/schuttler) will be used to disseminate some course information: homework assignments and solutions, exam solutions, practice problems, etc.

- Many important announcements, as well as some course material, will be sent to your UGA MyID email address: "...@uga.edu" where "..." is your UGA MyID. It is very important that you check your UGA MyID email daily, at [http://email.uga.edu/](http://email.uga.edu/). Make sure to carefully read every message with "PHYS1112" in the "Subject" line. You will be automatically subscribed to this email list with your UGA MyID email address only. If you wish to subscribe any additional email address(es) of yours to receive these email announcements see instructions in Homework Problem Set #00.

- Online assignments are an essential part of the course. You will access them with an account on the LON-CAPA system via [http://spock.physast.uga.edu/](http://spock.physast.uga.edu/) or via the backup site [http://surak.physast.uga.edu/](http://surak.physast.uga.edu/).

- Grade information will be made available through the eLearning Commons website at [http://elc.uga.edu/](http://elc.uga.edu/).

Other Student Resources

- Optional weekly homework clinics will give you and your classmates an opportunity to work on problems in small groups. I will be on hand to answer questions and give
guidance, but this is really designed for you to work together, not to watch someone else work problems.

- If you cannot 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.

- The textbook publisher has a companion Website for an earlier edition, at the URL http://www.prenhall.com/Walkerphysics/. This site contains summaries and practice problems for each chapter, and is a good way to increase your confidence and familiarity with the material.

- There is a Student Study Guide with Selected Solutions for this textbook that may be useful, although students have given this guide mixed reviews. Information on this and other resources is provided in your textbook.

- Tutors are available either through the UGA Tutoring Program at Milledge Hall, see http://www.uga.edu/dae/services/tutoring/tutoring_index.html; or directly through the Department of Physics and Astronomy.
Grading Policy and Assignments

Your overall grade will be determined from your course performance, based on your weighted average percentage score, computed as follows:

- 25% Cumulative final exam grade
- 45% Three in-class exams (20%/15%/10% for highest/middle/lowest grades)
- 10% Laboratory grade
- 15% Homework grade
- 5% In-class quizzes and (if any) reading quizzes

Letter grades will be assigned from your average percentage score according to the following cut-offs:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>92.5</td>
</tr>
<tr>
<td>A–</td>
<td>90.0</td>
</tr>
<tr>
<td>B+</td>
<td>87.5</td>
</tr>
<tr>
<td>B</td>
<td>82.5</td>
</tr>
<tr>
<td>B–</td>
<td>80.0</td>
</tr>
<tr>
<td>C+</td>
<td>77.5</td>
</tr>
<tr>
<td>C</td>
<td>72.5</td>
</tr>
<tr>
<td>C–</td>
<td>70.0</td>
</tr>
<tr>
<td>D</td>
<td>60.0</td>
</tr>
<tr>
<td>F</td>
<td>60.0</td>
</tr>
</tbody>
</table>

Average percentage scores will *not* be rounded (i.e., 89.99 is still a B+; a 90.00 is an A–).

Any requests for a regrade of an assignment or an exam must be made no later than one week after the item is 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.

Exams

There will be three in-class midterm exams and a cumulative final exam. All exams will usually be closed-book and closed-notes, but you are allowed and strongly encouraged to bring a copy/print-out of the formula sheet that will be posted on the course web site for each test. Important: Please note that the formula sheet will *not* be provided as part of your test/exam paper; so you must bring your own copy! The purpose of the formula sheet is to focus your studying on understanding rather than memorization. If you feel you need an equation that’s not on the sheet, don’t memorize it; learn how to derive it from the equations that are given. You may use a simple scientific calculator that is non-programmable, non-graphing, and non-symbolic. (Calculators such as the TI-83 or TI-84 are not allowed.)

In the alternative, I may also allow you to use your course textbook (Walker), but no other printed material. Therefore, please always bring your textbook to every exam, in case I do allow you to use it.

Exams will be multiple-choice only and they will comprise both conceptual and numerical problem-solving questions, very similar to homework, practice problems, and in-class examples. No points will be deducted for incorrect answers, so it is in your best interest to attempt answering every problem. Detailed solutions will be posted on the course web site 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 exam scores will be converted into “rescaled” numerical grades. This conversion is based partly on the distribution of raw scores, but also on the difficulty level of the exam. A rescaled numerical grade will *never* be lower than your raw score. Also, unlike a typical curve, you are *not* competing against your peers; it is possible (although not very likely!) for everyone to get
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 one of your midterms, making your final exam worth 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 of your illness.) Do not simply 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 students with legitimate, documentable reasons as explained above.

Homework

Regular, personal practice with physics problems is essential to understanding physics, so you will have weekly homework assignments. The assignments will generally be due every Thursday, although class pacing and scheduling may necessitate different due dates, which will be announced in class. Assignments will be posted online, and most problems will require you to submit your answers on the Web. However, some assignments may also have a handwritten component, which you should hand in to me directly at the beginning of class or put into envelopes posted at the door of my office, Room 313. (Do not slide anything under my office door.) Detailed solutions will be posted to the Web after the homework is due.

Responses will be graded for correctness, although for some problems handed in on paper incorrect responses may earn partial credit for the effort. In each LON-CAPA problem set, each correct answer contributes with equal weight to your total percentage score earned for that assignment. Problems that are to be handed in on paper must show all work legibly in order to receive credit.

Your two lowest homework assignment percentages will be dropped in calculating your overall homework score. The percentage score of each homework set included will then contribute with equal weight to your overall homework percentage score. Again, this 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 will not be accepted or excused. However, even if you miss the deadline to submit some or all problems in any homework assignment for credit, you should still make every effort to complete working out the solution of all problems in every homework assignment, in order to absorb and master the course material covered by the assignment. You will likely do very poorly on exams if you do not do work through each homework assignment in its entirety.

Teamwork can be a very effective way to learn, so I encourage you to collaborate with your classmates on homework problems. That is in fact a goal of the optional weekly clinics.
However, don’t mistake teamwork for plagiarism; your solutions must be your own. Copying or paraphrasing from someone else’s work, or 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.

**Reading Quizzes**

You are required to read the assigned textbook sections before the class in which those topics are discussed. I may occasionally assign short, multiple-choice online quizzes based on the reading material. Each quiz will be posted to the web on LON-CAPA on the day before the class it pertains to, if not earlier. You must complete the quiz by the start of the lecture (9:30am for period 2, 11:00am for Period 3, 2:00pm for Period 5) on the morning of the corresponding class.

Regular reading is an important part of your preparation for class. Don’t expect to understand everything in the textbook at first sight! However, your learning effectiveness in class will depend on having encountered the material prior to class. You should jot down notes and questions as you read; this will aid in organizing your class notes and will remind you to ask for clarification.

**In-Class Quizzes**

Throughout the semester, you will be asked in class to answer conceptual and quantitative questions, both individually and in small groups, and usually using the “clickers”. Your responses will be graded primarily on participation, although correct responses may sometimes receive a small bonus. These activities allow you to demonstrate your sincere effort and active engagement in the class.

Each lecture where one or more quiz question was presented constitutes one in-class quiz. In-class quiz questions presented later during a lecture will carry higher weight than earlier ones, in proportion to the order in which they were presented (1st question carries weight 1, 2nd question carries weight 2, ... etc.).

At the end of the semester, the percentage scores of these in-class quizzes will be combined with your reading quiz percentage scores into the quiz component of your overall grade. The three lowest-scoring quizzes (out of all reading and in-class quizzes combined) will be “dropped” to compensate for the occasional absence from class or “clicker” problem. The percentage score of each quiz included will then contribute with equal weight to your overall quiz percentage score.

**Extra Credit for End-of-Semester Online Course Evaluation**

A 0.5% bonus will be added to your final exam percentage score if you submit your online student course evaluation for this PHYS1112 course during the designated evaluation period at the end of the semester (dates to be announced) at the web site https://evals.physast.uga.edu/.

No other extra credit will be given in this course.
Academic Honesty

The University of Georgia has a comprehensive policy on academic honesty, described in a document entitled A Culture of Honesty. This document is available through the Office of the Vice President for Instruction or online at http://www.uga.edu/ovpi/. 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. Disruptions or distracting behavior will not be tolerated.

- You’re responsible for all topics discussed in class, all class announcements, and all assigned textbook reading (even if some sections aren’t explicitly covered in class). Absence does not excuse you from this responsibility. While attendance is not strictly mandatory, your understanding of physics (and your grade) will suffer if you skip class. If your schedule makes it difficult to attend class regularly and on-time, you shouldn’t take this course.

- You are responsible for the material covered in the assignments. 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 won’t get much learning value from homework if you leave it for the last minute, or depend on the efforts of others.

- Attend your assigned lab section and follow the TAs’ instructions. Refer to the lab syllabus for more information. If you have lab-related questions, please see or email Mr. Tom Barnello in Room 310 (Email: tjbar@physast.uga.edu, Phone: 706-542-2903)

- 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, published in the UGA Undergraduate Bulletin. Of particular importance is the following passage:

Students are limited to four withdrawals during their undergraduate careers. Students who fail to drop a course or wish to withdraw from a course after the designated drop/add period for a term must withdraw through OASIS (Online Access to the Student Information System). An instructor also may withdraw a student from a course due to excessive absences as defined in the course syllabus. Withdrawals after the drop/add period will result in course entries on the academic record with grades of WP or WF as assigned by the instructor(s). A student who withdraws or is withdrawn for excessive absences after the withdrawal deadline of the semester is assigned a grade of WF except when the student is doing satisfactory work and Student Support Services is able to approve the withdrawal because of a hardship situation.

For withdrawals before the midpoint, I will enter a grade of W 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! You are expected to officially withdraw in a timely fashion once you have made that decision. If you don’t complete the initial required administrative tasks of the course (e.g., the questionnaire), you may be withdrawn from the class.
PHYS 1112 Class Schedule
Spring 2010

The schedule below is approximate and subject to modification, possibly including changes in exam dates. Significant schedule changes will be announced in class. It is your responsibility to keep track of all such schedule changes by attending class and by regularly checking your UGA MyID email and the “Announcements” on the PHYS 1112 course web site http://www.physast.uga.edu/classes/phys1112/schuttler

Note that the midpoint withdrawal deadline is the 23rd of March, 2010.

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<thead>
<tr>
<th>Class</th>
<th>Date</th>
<th>Reading</th>
<th>Topic</th>
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<tbody>
<tr>
<td>1</td>
<td>Th 7 Jan</td>
<td></td>
<td>Course Intro</td>
</tr>
<tr>
<td>2</td>
<td>Tu 12 Jan</td>
<td>25.2, 25.3, 26.1</td>
<td>Nature of Light, Geometrical Optics</td>
</tr>
<tr>
<td>3</td>
<td>Th 14 Jan</td>
<td>26.2, 26.5, 26.3</td>
<td>Geometrical Optics</td>
</tr>
<tr>
<td>4</td>
<td>Tu 19 Jan</td>
<td>26.4, 26.6-26.8</td>
<td>Geometrical Optics</td>
</tr>
<tr>
<td>5</td>
<td>Th 21 Jan</td>
<td>27.1–27.3</td>
<td>Optical Instruments</td>
</tr>
<tr>
<td>6</td>
<td>Tu 26 Jan</td>
<td>27.4, 27.5</td>
<td>Optical Instruments</td>
</tr>
<tr>
<td>7</td>
<td>Th 28 Jan</td>
<td>28.1, 28.2</td>
<td>Wave Optics: Interference</td>
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<tr>
<td>8</td>
<td>Tu 2 Feb</td>
<td>28.6</td>
<td>Wave Optics: Gratings</td>
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<tr>
<td>9</td>
<td>Th 4 Feb</td>
<td></td>
<td>EXAM #1, Chapters 25–27</td>
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<tr>
<td>10</td>
<td>Tu 9 Feb</td>
<td>28.4, 28.5</td>
<td>Wave Optics: Diffraction</td>
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<tr>
<td>11</td>
<td>Th 11 Feb</td>
<td>19.1–19.3</td>
<td>Electric Charge and Force</td>
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<tr>
<td>12</td>
<td>Tu 16 Feb</td>
<td>19.4, 19.5</td>
<td>Electric Force and Electric Fields</td>
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<tr>
<td>13</td>
<td>Th 18 Feb</td>
<td>19.6, 19.7</td>
<td>Gauss’s Law</td>
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<tr>
<td>14</td>
<td>Tu 23 Feb</td>
<td>20.1–20.3</td>
<td>Electric Potential</td>
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<tr>
<td>15</td>
<td>Th 25 Feb</td>
<td>20.4–20.6</td>
<td>Electric Potential, Capacitors, Energy</td>
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<tr>
<td>16</td>
<td>Tu 2 Mar</td>
<td>21.1, 21.2</td>
<td>Current and Resistance</td>
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<tr>
<td>17</td>
<td>Th 4 Mar</td>
<td>21.4, 21.5</td>
<td>DC Circuits</td>
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<tr>
<td>18</td>
<td>Tu 16 Mar</td>
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<td>SPRING BREAK</td>
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<tr>
<td>19</td>
<td>Th 18 Mar</td>
<td></td>
<td>SPRING BREAK</td>
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<tr>
<td>20</td>
<td>Tu 23 Mar</td>
<td>22.1, 22.2</td>
<td>Magnetic Fields and Forces</td>
</tr>
<tr>
<td>21</td>
<td>Th 25 Mar</td>
<td>22.3, 22.4</td>
<td>Magnetic Fields and Forces</td>
</tr>
<tr>
<td>22</td>
<td>Tu 30 Mar</td>
<td>22.5, 22.6</td>
<td>Currents and Magnetic Fields</td>
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<tr>
<td>23</td>
<td>Th 1 Apr</td>
<td>22.7, 22.8</td>
<td>Currents and Magnetic Fields</td>
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<tr>
<td>24</td>
<td>Tu 6 Apr</td>
<td>23.1–23.4</td>
<td>Induction, Faraday’s Law, Lenz’s Rule</td>
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<tr>
<td>25</td>
<td>Th 8 Apr</td>
<td></td>
<td>EXAM # 3, Chapters 21, 22</td>
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<tr>
<td>26</td>
<td>Tu 13 Apr</td>
<td>23.5, 23.6</td>
<td>Induction and Work</td>
</tr>
<tr>
<td>27</td>
<td>Th 15 Apr</td>
<td>23.7, 23.9, 23.10</td>
<td>Inductance and Energy</td>
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<tr>
<td>28</td>
<td>Tu 20 Apr</td>
<td>25.1, 25.4</td>
<td>Electromagnetic Waves</td>
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<tr>
<td>29</td>
<td>Th 22 Apr</td>
<td>25.5</td>
<td>Electromagnetic Waves, Polarization</td>
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<tr>
<td>30</td>
<td>Tu 27 Apr</td>
<td></td>
<td>Course Review</td>
</tr>
<tr>
<td>31</td>
<td>We 5 May</td>
<td></td>
<td>FINAL EXAM, 7pm–10 pm, location: T.B.A.</td>
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</table>