University of Minnesota  
School of Physics and Astronomy  

Physics 1302, Spring 2011, Section 500: Introductory Physics II  
Preliminary Syllabus  

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Office Hours: M and W: 2pm to 3pm or by appointment  

Required Books:  
Paul A. Tipler and Gene Mosca: Physics for Scientists and Engineers, 6th edition,  
http://bsc.whfreeman.com/tiplerphysics6e/  
Physics for Science and Engineering Laboratory Manual-Electromagnetism Laboratory, current edition  

Important: It is strongly suggested that you purchase the textbook using the following procedure:  
1. Go to http://webassign.net  
2. Select “I have a class key”  
3. Enter the class key umn 7759 3371  
4. Create a username (please use your U of M x500 ID, for example hain0115). If you decide to register without paying now, you will be prompted to pay after a few weeks.  
5. Use a credit card to pay WebAssign $25. This payment will give you one semester’s access to both an electronic version of the textbook and the WebAssign homework system. Another option is to wait until when you are prompted to pay, and start the 14 day free trial.  
6. When you access the electronic version of the textbook, you will have the option of purchasing a printed version of the textbook for an additional $25 plus about $6 shipping. The publisher will ship the book directly to you. The book you should select is Volume 2. The publisher will ship the book directly to you.  

In summary, a printed version of the text, an electronic version of the text and WebAssign will cost you about $56, including shipping. In comparison, the printed version alone costs $86.70 at Amazon. See the last page of this syllabus for more information.  

Quiz days: Mondays and Wednesdays,  
7th & 9th February; 28th Feb & 2nd March; 4th & 6th April; 25th & 27th April.  
Final: Thursday 12th May 18.30-21.30 (room tba) See “Common Final Exams”  

Required Materials:  
Approved laboratory notebook (available at the University Bookstore)  
An Interwrite PRS RF Transponder unit (available at the University Bookstore)
Email and Phone Policy
E-mail and voice mail do not work as a means of communication with the professor for a class of this size. Therefore, I will not be able to answer any questions by email or reply to voice mail. Please talk to me in person, during the office hours, or before or after class, or contact your TA. E-mail for the course should be sent to our HEAD TA. He will contact me if necessary.

TA Office hours: Office hours held by the 1302 TAs will be included on our web page office hour link. These will be held in Tate 137. Tate 137 is the TA office hour room for all Physics TAs, and each TA, whether they are assigned to our course or other introductory courses, are available for consultation about all introductory courses. Feel free to consult any physics TA holding office hours in that room. TAs are available M-F from 8am to 6pm. (Tate Laboratory = Physics Building)

Course Overview:
Physics 1302 is the second course of a three-semester sequence (1301, 1302, 2503) providing an overview of 21st Century physics from the perspective of students interested in science and engineering. Physics is the study of matter, energy and their interactions, everywhere in the knowable Universe. The primary focus of Physics 1301 is Mechanics, including Kinematics (the description of motion) and Dynamics (the description or prediction of motion as a result of forces, momenta and energies). The primary focus of Physics 1302 is electromagnetism and optics. Physics 2503 explores physics developed during the 20th Century.

21st Century physics is a science based on principles rather than on taxonomy. Its goals are to describe the behavior of the Universe in terms of a few (and perhaps ultimately one) general principles. The goals of this course are to help you reach the educational objectives of your major by:
• Building your understanding of how natural phenomena in the Universe can be understood, and often predicted, in the context of a few basic principles;
• Improving your ability to conceptualize natural phenomena, using appropriate physics principles and mathematical models;
• Giving you practice in the use of mathematical models to make quantitative predictions about the behavior of physical systems in the Universe;
• Increasing your skill in making measurements of physical properties;
• Providing an opportunity to practice communicating technical information in an organized and readily understandable way.

Course Style: Physics 1302 is generally considered to be a demanding course. The course moves at a fast pace. Since each new topic builds on previous work, it is of great importance that you do not fall behind. You should expect and plan for a workload consistent with University policy (three hours per week per credit for a total of twelve hours per week for an average student to receive an average grade). This amounts to at least six hours per week outside of scheduled class meetings. You will need to be organized and to complete the required assignments on time.
What You Need to Do for Physics 1302:

• Come to class Monday and Wednesday with the reading assignment for that day completed and ready to think, participate and learn. During every class, you will use your PRS transponder to submit answers to short problems that you will solve during class. You are encouraged to work with students sitting near you to solve these in-class problems. This term we will have access to several Learning Assistants, who will help during lectures: one result from education research is that active learning is better than passive learning. Please participate!
  • Participate in problem sessions on Mondays ready to work in groups on a problem that will be handed out in class.
  • Appear on time for your assigned lab section ready to work with your lab partners to make observations and measurements regarding physical phenomena that are discussed in class. Your lab instructor will provide additional information about lab write-ups (required because this class is listed as writing-intensive). There will be labs every week of the semester, including the first.
  • Do the assigned weekly homework problems using WebAssign.
  • Take four hour exams on Mondays/Wednesdays (see schedule at the end of this syllabus) and one final exam (Thursday, May 12, 2011 at 6:30 p.m. to 9:30 p.m.). The Monday section of the hour exam will be a group problem, done in your discussion session. It will count for 25% of your total grade for the hour exam. The Wednesday section of the hour exam (75% of the total grade) will be done individually. For both the hour exams and the final exam, you can use one handwritten 8½ inch by 11 inch (double-sided) sheet of equations.

Mathematics:
21st Century physics is highly dependent on mathematical models for quantitative results. Success in Physics 1302 will require you to develop and apply mathematical skills. The most important skill is the ability to describe a physical context in terms of a mathematical model. Geometry and trigonometry are particularly important. Modeling dynamically changing systems will require differential calculus. Aggregating individual effects will utilize integral calculus. You may encounter some mathematical techniques in physics before you see them in your math class. For that reason, Physics 1302 will include some topics in mathematics, particularly in differential, integral and multivariable calculus and differential equations.

Problem-Solving Groups:
Science and technology in the world today is generally done in collaborative groups. For that reason, much of the work in this class will be done in groups. You are strongly encouraged to develop informal problem-solving/study groups with other people in this course. Research on study groups suggests mixed gender groups work best and all-male groups are the least effective.

Laboratory:
Because this course satisfies University requirements as a laboratory science class and as a writing intensive course, you must pass the laboratory (60% of the possible score) to receive a passing grade in the course. The laboratory grade will be based on pre-lab quizzes, well thought out predictions, collaborative skills as evidenced by effective group work and a well organized and correctly written technical communication of the physics concepts of this course in your laboratory journal and laboratory reports.
You will write a total of five laboratory reports. **The specific part of the laboratory for which you will write a report will be assigned to you by your instructor at the end of each laboratory topic (about every two weeks).** Reports should be about 4 typed pages (use of a word processor is encouraged and such facilities are supplied by the University) including all necessary predictions, graphs, data tables, and calculations. **Reports must be given to your laboratory instructor for grading on time. Late reports will not be accepted.** Graded reports will be returned to you not later than your next laboratory meeting and may be revised, only with instructor permission, to achieve a higher grade. If a revised report is allowed, it must be given to your laboratory instructor within 2 days. Details of the laboratory grading are in your laboratory manual.

Read the relevant portions of the lab manual before attending a lab. Each lab has several sections, and your TA will tell you which sections to have prepared each week. All the laboratory problems have sections called Prediction and Method Questions. You should hand in your answers to these sections to your TA the day before your scheduled laboratory session.

Failure to participate in the laboratory will result in a laboratory grade of 0 for that topic. Since the laboratory involves teamwork, no laboratory makeup will be allowed except in situations officially recognized by the University. In that case, the laboratory work must be made up by arrangement with your TA before your next scheduled laboratory period. The lab is done in the same small groups as the discussion sections, which are changed periodically. Lab data is taken cooperatively, but you are responsible for writing your own reports.

**Grades:**
Homework problems: 15%
Short problems in class (using PRS transponders): 5%
Laboratory pre-lab quizzes, participation and lab reports: 20%

**The better of two options for the remaining 60%:**
Option 1: Four hour quizzes count 10% each and the final exam counts 20%.
Option 2: The lowest hour exam grade is dropped. Three hour quizzes count 10% each and the final exam counts 30%.

Notes on Grades:
1. The grades assigned by each lab instructor may be normalized. If your lab instructor grades particularly easily, your lab grade may be adjusted downward before the final grade calculation.
2. There are four sections of Physics 1302. The four sections generally attempt to achieve similar final grade distributions. In the past, the mean grade for Physics 1302 has been in the B/B- range.

**Your course grade** will be calculated on an absolute scale, as follows:
- A: 100 - 89%, A-: 88 - 83%, B+: 82-78%, B: 77-73%,
- B-: 72-68%, C+: 67-63%, C: 62-58%, C-: 57-53%,
- D+: 52-48%, D 47-43%, F: <43% or lab grade <60%.

**Expectations:**
- Turn off the ringer on your cell phone while in class.
- No emailing, texting, facebooking, etc. in class
- Do your own work on the individual exams and in writing the lab reports.
Questions and Concerns:
You are welcome to address your questions or concerns to the course instructor and/or the Teaching Assistants in person, by email or by telephone. **The goal of this course is to improve your knowledge and understanding of physics.** If something is interfering with that goal, you need to make your concerns known to somebody who can address them.

Make-ups:
As specified by University policy, missed quizzes will result in a grade of zero except in the event of conflicts with scheduled activities of official University organizations, religious holidays, and verifiable illnesses as prescribed by University regulations. The course instructor must be notified at the beginning of the semester or as soon thereafter as possible (no less than three weeks in advance) about conflicts due to scheduled, official University activities or religious holidays. Disputes concerning the validity of an excused absence will be settled in consultation with the Director of Undergraduate Studies in Physics. A make-up final exam will be given only for students with valid, verifiable conflicts of these types, or students with three final examinations in a 16-hour period if our exam is the middle of the three exams. Requests for make-ups for reasons other than those specified by University policy cannot be honored.

Other information:
The official web page for the Physics 1302W.500 is http://www.physics.umn.edu/courses/2011/spring/Phys%201302W.500/index.html
General course information, lecture outlines/synopses, solutions for the assigned problems and the tests, and other items will be made available through this class web site.
Minnesota privacy laws require that tests and other materials are returned in a manner that ensures that no one else can see your grades. Papers will be handed out at the first recitation after grading is completed.

CHEATING: Don't do it!
All work that you turn in for a grade must be your own. The following behaviors are considered to be cheating.
  a. Using the responder of another student
  b. Copying all or part of a lab report, data table or fabrication of data (see Intro, pg. 3 of Lab Manual)
  c. Copying all or part of a homework assignment or exam
  d. Any other matter covered by the University statement below.
Your TAs are observant. They notice duplication in lab reports and quiz problems.

Mandatory Statement about academic integrity:
The University expects the highest standards of honesty and integrity in the academic performance of its students. Any act of scholastic dishonesty is regarded as a serious offense, which may result in expulsion. Scholastic dishonesty is defined as submission of false records of academic achievement; cheating on assignments or examinations; plagiarizing, altering, forging, or misusing an academic record; taking, acquiring, or using test materials without faculty permission; acting alone or in cooperation with another to obtain dishonestly grades, honors, submission of false records of academic achievement; cheating on assignments or examinations; plagiarizing, altering, forging, or misusing an academic record; taking, acquiring, or using test materials without faculty permission; acting alone or in cooperation with another to obtain dishonestly grades, honors, awards, or professional endorsement. Aiding and abetting an act of scholastic dishonesty is also considered a serious offense with the same possible consequences. Students may not make commercial use of their notes of lectures or University-provided materials without the express written consent of the instructor. (See the Senate policy at http://www.policy.umn.edu/Policies/Education/Education/STUDENTRESP.html.)
Academic dishonesty in any portion of the academic work for a course shall be grounds for awarding a grade of F or N for the entire course.

Classroom courtesy
Lectures end when the idea or technique under discussion has been concluded and the lecturer has indicated that the students are free to leave. For this reason lectures are rarely expected to end exactly at the end of class time. Packing up books, putting on coats, or standing up while the lecture is in progress interferes with the learning of other students and shows disrespect for the educational process. Those who must leave early should sit near the end of a row to minimize the disturbance they will inflict on the other students,
however consistent with a seating plan that will be introduced to optimize group activities. Cell phones, MP3 players and similar devices must not be used and must be turned off during the lecture period. Computers may only be used for taking class notes, and keyboarding must not be a disturbance to other members of the class. Note that food and drinks are not allowed in Room 150.

**Physics 1302 has an interactive lecture.** If you choose not to participate (for example by doing crossword puzzles, work for other classes, web browsing, etc.), you will be excused from lecture.

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**SUMMARY**

**Before each lecture:**
- Read the assigned readings announced in lecture

**Before each lab:**
- Read the Introduction, Objectives and Preparation sections of the write-up in the lab manual for the problems your instructor has assigned for that week. Turn in Predictions and Warm-ups to TA one day before lab.
- Complete any suggested text reading that is given in the Preparation section.

**On-going:**
- Complete the assigned homework problems.
- If you have questions on homework problems, etc., you can attend TA office hours.
- Lab reports will be due about every other week. Your TA will assign them.

**Quizzes and final exam:**

There will be 4 quizzes given on Wednesdays -- 9th February; 2nd March; 6th April; 27th April.

Four “group” quizzes on Mondays -- 7th February; 28th Feb; 4th April; 25th April.

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**Announcements**

It is occasionally necessary to modify the course schedule, including the dates of quizzes. Students are responsible for ALL announcements made during the lecture, Discussion Session or Laboratory Period. Every announcement will be posted on the "Class News" web page. Missing an announcement is not an acceptable excuse for missing a quiz or a course-related deadline. It is the responsibility of any student missing a lecture to determine what course material and/or announcements were missed.

**THIS WILL DEFINITELY CHANGE**

**Tentative Lecture/Laboratory Schedule**

<table>
<thead>
<tr>
<th>Week # (Mon. Date)</th>
<th>Text Chapters</th>
<th>Assigned Lab(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week 1 (1.18)</td>
<td>Chap. 21 (E-charge/force)</td>
<td>CSEM</td>
</tr>
<tr>
<td>Week 2 (1.24)</td>
<td>Chaps.21 and 22 (E-field)</td>
<td></td>
</tr>
<tr>
<td>Week 3 (1.31)</td>
<td>Chaps.22 and 23 (Gauss/E-potential)</td>
<td></td>
</tr>
<tr>
<td>Week 4 (2.7)</td>
<td>Chap. 23 (E-potential)</td>
<td><strong>Quiz Week</strong></td>
</tr>
<tr>
<td>Week 5 (2.14)</td>
<td>Chap. 11 (Gravity)</td>
<td>Labs</td>
</tr>
</tbody>
</table>
The following are directions for purchasing your WebAssign/Tipler Physics eBook online.

**FIRST, PLEASE NOTE:**

1) **PRINT COPIES:** If you choose, you may also purchase a printed copy of the text online for only $25.00. This offer "Pops-Up" on the eBook page once you have registered and logged into your eBook.

2) **ACCESS CARDS:** May be purchased in the bookstore if you prefer.

**Directions For Online Purchasing:**

You will need to register at WebAssign to gain access to your class online homework assignments and eBook. Your instructor will provide you with necessary information to register online using your class key. Go to [www.webassign.net](http://www.webassign.net)

---Select I HAVE A CLASS KEY in the log-in area.
---On the next screen, enter your Class Key and continue.
---You will then create a username and password for yourself.
---For Institution Code, enter: umn

You are now enrolled in your instructor’s WebAssign course and will be asked to purchase access to the WebAssign system.

Select the option to Purchase Access Online.
---On the following screen, select your access level and proceed to checkout. The cost is $25.00 per term.
---You will be asked to enter your credit card/paypal information to complete the transaction.

You may now access your WebAssign Course and eBook!