Physics 260
General Physics: Vibrations, Waves, Heat, Electricity, and Magnetism
Fall 2003

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Office Hours: Tues. 2 – 3 P.M. and Wed. 11:00 A.M. – 12 noon.
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Office hours: to be announced.

Textbook: Serway and Beichner, Physics for Scientists and Engineers,
Vol. 1 (wt. 4 lb.) & 2, (wt. 4.5 lb.) 5th Edition (Pub. Harcourt)

Class Time (Lecture): Mon., Wed. Fri. 3:00 – 3:50 P.M. Room: Z1412

Discussion: Section Day/Time Room TA
(0301); Th. 3:00 – 3:50 P.M.; 1402 (Phys.) Anderson
(0302); Tu. 10:00 – 10:50 A.M.; 3301 (Phys.) Anderson
(0303); Tu. 12:00 – 12:50 P.M.; 3301 (Phys.) Harris
(0304); Wed. 9:00 – 9:50 A.M.; 4208 (Phys.) Harris
(0306); Wed. 8:00 – 8:50 A.M.; 0405 (Phys.) Harris
Honors: Wed. 1:00 – 1:50 P.M.: 3301 (Phys.)

Lecture Schedule

<table>
<thead>
<tr>
<th>Mon./Wed.</th>
<th>Fri.</th>
<th>Assignment from Serway and Beichner*</th>
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</thead>
<tbody>
<tr>
<td>September</td>
<td></td>
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</tr>
<tr>
<td>3</td>
<td>5</td>
<td>Chap. 13</td>
</tr>
<tr>
<td>8</td>
<td>12</td>
<td>Finish Chap.13; Chap. 15**</td>
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<tr>
<td>15</td>
<td>19</td>
<td>Chap. 16; Chap. 17**</td>
</tr>
<tr>
<td>22</td>
<td>26</td>
<td>Chap. 18**; Review</td>
</tr>
<tr>
<td>29</td>
<td></td>
<td>Exam I (Chapt. 13, 15-18)</td>
</tr>
<tr>
<td>October</td>
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<tr>
<td>1</td>
<td>3</td>
<td>Chap. 19</td>
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<tr>
<td>6</td>
<td>10</td>
<td>Chap. 20</td>
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<tr>
<td>13</td>
<td>17</td>
<td>Chap. 21**</td>
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<tr>
<td>20</td>
<td>22</td>
<td>Chap. 22; Review Chapt. 18-22</td>
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<tr>
<td></td>
<td>24</td>
<td>Exam II</td>
</tr>
<tr>
<td>27</td>
<td>31</td>
<td>Finish Chap. 22; Chap. 23</td>
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<tr>
<td>November</td>
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<tr>
<td>3</td>
<td>7</td>
<td>Finish Chap. 23; Chap. 24</td>
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<td>10</td>
<td>14</td>
<td>Finish Chap. 24; Chap. 25</td>
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<tr>
<td>17</td>
<td>21</td>
<td>Finish Chap. 25; Review</td>
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<tr>
<td>24</td>
<td></td>
<td>Exam III</td>
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<tr>
<td>26</td>
<td></td>
<td>Chapt. 26</td>
</tr>
<tr>
<td>27-30</td>
<td></td>
<td>Thanksgiving Holiday</td>
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</tbody>
</table>
December 1  5  Chap. 27

December 8  12  Chap. 28; Review for Final

* There is too much material to cover in one semester. Therefore, some sections in specific chapters will be omitted. Sections to be omitted will be announced in class.

** Not all sections will be covered. Relevant sections will be announced in class.

Exam Schedule#

- Exam I  Monday, 29 September   Chapters 13, 15-18
- Exam II Friday, 24 October     Chapters 18-22
- Exam III Monday, 24 November   Chapters 22-25
- Final Exam Wednesday, 17 December (1:30-3:30 P.M.) Chapters 13, 15-28

# Exams I, II, & III are for 50 minutes and are cumulative. The best two out of three “hourly” exams will be counted in determining your grade for the course. Makeup exams will be given only for a student with a valid documented excuse (doctor’s note accident report, funeral notice, etc.) If you know ahead of time that you will miss an exam you must notify me before the exam. If you miss an exam due to an emergency, let me know as soon as possible. I will be flexible for those with valid excuses who have given timely notification. Makeup exams will probably be given during final week. Note that you may use your one dropped hourly exam as a makeup substitute in cases in which you do not have a documented excuse.

Course Description

This course is the second semester of a three-semester course in introductory physics. The subjects consist of three “units”: 1) Oscillations and Waves; 2) Fluids and Heat; 3) Electricity through dc circuits. This is a calculus-based sequence and makes extensive use of the material in Math 140 and 141. We will use some vector calculus, e.g. line and surface integrals. The course will stress a qualitative understanding of physical phenomena as well as quantitative understanding by problem solving. The lectures will concentrate on covering the major topics and providing insight into the material. Students are responsible for the assigned material, even that not covered in the lectures. Students are also responsible for material that is discussed in class but is not in the textbook, especially if the subject is emphasized during the lecture. If you miss a lecture, get notes from a classmate or see Dr. Anderson. In fact, you are strongly encouraged to come to office hours or schedule a separate meeting if you have questions. You can make arrangements at the end of a lecture, by telephone, or by dropping by Dr. Anderson’s office. You should not expect a timely response to e-mail, however. To get the most out of the lectures, it is imperative that students read the text before class.

The Laboratory, Physics 261, is now graded separately; however, at the request of the Engineering College, the lab grade will be included in the grade for this course, Physics 260. You must be enrolled in Physics 261, complete all the assigned labs, and pass Physics 261 in order to pass and get credit for Physics 260.
**Homework and Quizzes**

Part of your homework will be based on an internet system, WebAssign. Details will be given later. The problem with WebAssign is that it checks only your answer (normally numerical or T/F) and does not check your method. That is, there is no way with WebAssign for you to get corrections on your approach to the answer. For this reason, one or more additional homework problems will be assigned in your discussion section and graded.

My tentative approach to homework assignments and schedules is as follows: The WebAssign Problems are given in this schedule with the dates due. WebAssign problems will also be posted via WebAssign. You should work these problems to completion and submit your answers to WebAssign. You will learn immediately if each answer is correct or not. You may have 4-8 additional attempts to get the correct solution and you will be graded on your final answers. Since you will have at least 5 possible attempts, there is no reason to get less than 100% on your WebAssign homework. You are also encouraged to ask about this homework during the lectures.

The additional homework assigned in your discussion section will be due at your discussion section the following week. One homework problem from each set of homework problems will be graded.

Homework solutions in a ring binder will be on reserve and available for study at the Engineering and Physical Sciences Library. Another set will be posted on the bulletin board inside one of the wall cabinets that is just outside your lecture room (1412). You may make a xerox copy of the solutions at the Library, but, if any solutions are missing from the ring binder, I will no longer provide solutions in the library.

**Quizzes**

Quizzes will be announced at least one class period ahead of time and will take place during the final 15 minutes of a lecture. Each quiz problem will be based on a homework assignment. In addition, quizzes may be given in your discussion section.

**Accessing WebAssign**

1. Go to [www.webassign.net](http://www.webassign.net)
2. Hit “login”.
3. Enter your username, institution, and password. Your username is the portion of your e-mail address before the “@” symbol; i.e. if your e-mail address is student1@wam.umd.edu, then your username is “student1”. Your institution is “umd” and your password is set initially to your social security number, i.e. your student ID number. You may change your password once you log in.

4. You will need to pay for access to WebAssign. You can do this as follows:
   - Buy a Student Access Code Card at the University Book Center or the Maryland Book Exchange, or
   - Pay on-line with a credit card.

**Help**

Help in understanding concepts and solving problems can be obtained from several sources: 1. Discussions with me after class or in my office. I encourage you to stop by my office. You can stop and see if I am available or you can telephone to set up a
meeting time. I think it is helpful to study with others and you may come as a group to my office to ask questions. My regular office hours will be announced later. 2 Your recitation/discussion class. At the class you may ask questions of your TA or you may go to his office hours, which will be announced later. 3. The Slawsky Clinic, which is on the first floor of the Physics Building.

**Grade**

Your grade will be determined approximately as follows:

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Final exam</td>
<td>30%</td>
</tr>
<tr>
<td>Two out of three hourly exams</td>
<td>35%</td>
</tr>
<tr>
<td>Lab Grade</td>
<td>15%</td>
</tr>
<tr>
<td>Homework (including WebAssign) and Quizzes</td>
<td>20%</td>
</tr>
</tbody>
</table>

Active class participation will improve your chances for a higher grade. Course letter grades will be determined approximately as follows: highest 25% - A; next highest 35% - B; third highest 25% - C; lowest 15% - D & F.

**Academic Integrity:** This University has a student-administered Honor Code and Honor Pledge on the web at [http://www.jpo.umd.edu/aca/honorpledge.htm](http://www.jpo.umd.edu/aca/honorpledge.htm). This code prohibits cheating on exams, plagiarizing papers, etc. All students are expected to follow this Code.

**Students with Disabilities:** See me after class or in my office.

**Homework Assignments**

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Homework Assignments</th>
<th>Due Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chapt. 13</td>
<td>WebAssign Problems 1, 3, 11, 21, 23, 28, and 33</td>
<td>8 September 2003</td>
</tr>
<tr>
<td>Chapt. 15</td>
<td>WebAssign Problems 1,6,11,17,23,33,41</td>
<td>12 September 2003</td>
</tr>
<tr>
<td>Chapt. 16</td>
<td>WebAssign Problems 3,6,8,10,16,22,25,30,38,43</td>
<td>19 September 2003</td>
</tr>
<tr>
<td>Chapt. 17</td>
<td>WebAssign Problems 1,3,9,14,18,26,33</td>
<td>26 September 2003 – Skip Section 17.5 on Doppler Effect except for definitions.</td>
</tr>
<tr>
<td>Chapter 19</td>
<td>WebAssign Problems 2,4,9,12,22,27,34,50</td>
<td>3 October 2003</td>
</tr>
<tr>
<td>Chapter 20</td>
<td>WebAssign Problems 4,11,15,21,28,36,38,44,50,51</td>
<td>10 October 2003</td>
</tr>
<tr>
<td>Chapter 21</td>
<td>WebAssign Problems 3,7,16,21,26,30,35,37,40</td>
<td>17 October 2003</td>
</tr>
</tbody>
</table>
Chapter 22  WebAssign Problems 1,6,9,16,20,24,29,34,35,40,54***
Due 22 October 2003
Chapter 23  WebAssign Problems 1,6,12,13,19,24,27,36,41,48
plus unfinished problems from Chapter 22
Due 31 October 2003
Chapter 24  WebAssign Problems 1,5,10,14,23,27,36,41,48
Due 10 November 2003
Chapter 25  WebAssign Problems 1,3,8,15,17,20,32,36,42,48
Due 17 November 2003
Chapter 26  WebAssign Problems 2,3,9,21,23,34,43,50,52
Due 3 December 2003
Chapter 27  WebAssign Problems 1,8,13,17,26,28,37,42
Due 8 December 2003
Chapter 28  WebAssign Problems
12 December 2003
*** Chapter 22 WebAssign problems will be divided into two parts; details
will be announced in class.
Questionnaire for Physics 260. Returning this questionnaire is optional.

Name:
Soc. Sec. No.:
Local Address:

Local Phone:
E-mail Address:
Major:

When did you take your last math course? What was it?

Have you had any physics class? ____ In high school? ____ In college? ____

If so, at what level (e.g. was it calculus-based)?

What days and times for office hours would fit your schedule?

If we had weekly review sessions late in the afternoon or in the evening, would you be interested? ____ Would you attend? ____ If so, what days and times would be best for you? ________________

Although we are expected to cover main topics, I have some flexibility in the material to be covered. Are there any particular things that you hope to get from this course?

Are there any topics you want stressed, or questions you want answered? (This is your best chance to be sure that they will be covered; therefore, be as explicit as possible. Adjustments can be made during the semester if there is sufficient class interest.)
These problems are not for grading, but are only for you to see the math background expected for this course. If you have difficulty with these examples, either review your previous courses or see me for help.

**Algebra**
1. Find $x$ if $x + 3 = 11$.
2. Find $t$ if $5t^2 + 6t + 1 = 0$.
3. What is the equation in terms of $x$ and $y$ for a parabola?

**Trigonometry**
4. Convert $90^\circ$ to radians.
5. Convert $60^\circ$ to radians.
6. Find $y$ if $y = \sin(\pi/6)$.
7. What is $\sin^1(1/3)$?
8. What is $\sin^2(\pi/4) + \cos^2(\pi/4)$?
9. What is $\sin^2(\theta) + \cos^2(\theta)$?
10. Show that $\sin(A+B) = \sin(A)\cos(B) + \cos(A)\sin(B)$.
11. For a right triangle with one side of 4 cm and a hypotenuse of 6 cm, find the length of the other side. Sketch the triangle and give values for all three angles.

**Differentiation**
12. Find $dy/dt$ if $y = at^4 + bt^3$.
13. What is $d(\cos x)/dx$?
14. What is $d(\ln(t))/dt$, where $\ln(t)$ means the natural logarithm of $t$?
15. Find the value of $y$ for which the function $f(y) = 3y^2 - 15y + 3$ has a maximum or minimum. Is it a maximum or a minimum? Find the values of $y$ at which $f(y) = 0$. Sketch $f(y)$ vs. $y$.

**Integration**
16. Find $y$ if $y = \int at^3 \, dt$.
17. If $x = \int_0^6 3t^2 \, dt$, find $x$.
18. If $z = \int_0^6 e^t \, dx$, find $z$.
19. Find $x$ if $x = \int_1^2 1/t \, dt$.
20. What is the value of the integral $\int \sin(x) \, dx$?
21. If $y = at^3 + bt^2 + e^t$, find $d^2y/dt^2$. 