Physics 136  
Course Syllabus

Class time and location  
MWF 10:10 – 11:00 (Lecture) Nielsen Physics Rm 304  
F 2:30 – 4:25 (Lab section 2) Nielsen Physics Rm 203  
F 4:40 – 6:35 (Lab section 1) Nielsen Physics Rm 203

People  
Dr. Stuart Elston, Instructor  
Office: Nielsen Physics 515  
Office phone: 974-7818  
Office hours: MWF 1:30 – 3:00  
TR 10:10 – 11:30  
or by appointment.  
Email: selston@utk.edu ---BUT if it’s about an assignment, use WebAssign’s Ask Your Teacher or Extension Request at the end of the assignment.  

James Alsup, Teaching Assistant

Catalog Description  
Introduction to Physics for Physical Science and Mathematics Majors II (4)  
Calculus-based physics of thermodynamics, electricity, magnetism, and optics. (NS)  
Contact Hour Distribution: 3 hours lecture and 2 hours lab.  
(RE) Corequisite(s): Mathematics 142.  
Comment(s): Alternative to 138 for physics majors.

Course Description  
Physics 136 is the second semester of a two-semester sequence of calculus-based introductory physics for math, computer science, and science (including physics) majors, and for anyone else interested in learning physics with calculus. The course includes laboratory exercises. Topics covered in the second semester include fluids, waves, kinetic theory and thermodynamics, electricity and magnetism, circuits, electromagnetic waves, and optics.

Course Schedule  
A current schedule can be found in the Schedule folder of the Course Information section of the Online@UT (Blackboard) course site for this course.
Course Materials
Required course materials include a textbook, a lab manual, WebAssign online homework system access (included in price of a new textbook), and a clicker (personal response system device). Each of these are discussed below.

Textbook
*Understanding Physics*, 1 ed., Cummings, Laws, Redish, and Cooney (John Wiley & Sons, Inc.). Cost: approximately $151.00 (new) for the physical hardcover textbook. This is a relatively new textbook, so there may not be many used copies around. The new price, at the campus bookstore, includes a WebAssignPlus access codecard good for two semesters (this is worth $56.00). If you find and purchase a used book, you will need to purchase WebAssign access (see below) to complement the book. It is also possible to purchase standalone WebAssignPlus access only, as that will provide access to an electronic version of the textbook.

This is a little complicated, so – in summary, there are four options for the textbook:
1) Purchase a new textbook ($151), which includes WebAssignPlus access.
2) Find and purchase a used textbook (cost=??), then purchase WebAssign access online for $12/semester.
3) Find and purchase a used textbook as in (2) above, and also purchase WebAssignPlus access online for $28/semester. WebAssignPlus has all the features of WebAssign, plus access to an online electronic version of the textbook and other extras such as live video demonstrations, simulations of various physical phenomena, a study guide, check-yourself quizzes, and written solutions and explanations of selected end of chapter problems.
4) Purchase WebAssignPlus online ($28/semester) only, and either read the text material from the electronic version on a computer display, or print the needed sections out (probably easier on the eyes).

I’m old fashioned – I like to have a hardcopy book to read, so I’d recommend option (1), or (2) or (3)(if you can find a used copy). If you can handle the eyestrain of reading it from a computer screen and the hassle of not being able to flip through the pages, or the hassle of having to print out the assigned reading sections every few days, option (4) will save about $95 over option (1).

Also Note: if you hunt around a little, you may find that there is a version of this textbook that is published as four separate paperback volumes (the book at the UT Book and Supply Store is the equivalent of all 4 volumes in a hard binding plus WebAssignPlus). You could get away with the first 3 volumes (we won’t cover the material in volume 4 in this course), but you would still need the WebAssignPlus access (at $56 for two semesters). So, this approach is not cost effective unless you can get those 3 volumes for less than (and considerably less than) $151 - $56 = $95, or less than about $30 per volume.
Lab Manual
*Selected Introductory Physics Experiments*, 2002 edition, Parks (Thompson Custom Publishing). Cost: approximately $51.00. This manual is required for the laboratory sections. Used copies may be available.

WebAssign access
WebAssign or WebAssignPlus access is required for this course; WebAssignPlus is included with a new textbook purchase. If you purchased the book new last semester, you should have already paid for this semester’s access. You can purchase standalone WebAssign or WebAssignPlus directly online from WebAssign, using a credit card. The cost is $28.00 per semester for WebAssignPlus, $12/semester for vanilla WebAssign; you only need to purchase one semester at a time. WebAssignPlus includes access to the WebAssign online homework and grading system, electronic versions of the complete textbook, a student study guide, hints and answers to some end-of-chapter problems, check-yourself quizzes, videos to complement textbook figures, and simulation “applets”.

Clicker
“Clickers” (personal response systems) have been shown by research to be effective in keeping students engaged in a large class environment (more than about 20 students). The University of Tennessee has adopted a particular clicker system (the CPSrf clicker system) by a company called eInstruction. This way, you only need one clicker for all the courses you take that may use them, and they should be easier to sell when you no longer take courses large enough to need them. We will use the CPSrf clickers in this class, so you need to have one. They are available at the UT Book and Supply Store, and probably at other local bookstores. Once purchased, it is necessary to register your clicker for each class that uses them. The one semester fee for registration, which covers all courses using clickers for that semester, is $13.

Tutorial Center
The Physics Department operates a tutorial center on the second floor of Nielsen Physics Building. See [http://www.phys.utk.edu/tutorial_center/](http://www.phys.utk.edu/tutorial_center/) for an up-to-date listing of dates, times, and places of operation.

Attendance
Attendance is required. Physics is a subject that builds upon itself. You will quickly find that if you miss classes, you will rapidly fall behind and it will be very difficult to catch up. If you do miss a class, it is your responsibility to get (and study!) the course notes from a classmate. A missed quiz and missed clicker questions can not be made up (but some fraction of the lowest scores will be dropped from the final average). A missed exam can be made up only by producing *documented evidence* of a legitimate medical reason or personal family emergency.
Assignments
The reading and homework policies below are designed to encourage you to learn a little physics every day, rather than cramming a lot into a short period prior to a homework or exam deadline.

Reading
Reading the text for understanding is critical in a physics course. A text reading assignment will be given for every class day except when an exam is scheduled. It is expected that you do this reading before class. You can expect to be lost in class if you have not done this reading, but you can not expect all of the reading material to be reviewed or discussed in class. In-class quizzes may depend on having read the text material. You will be assigned homework problems that depend on reading material that has not been covered in class.

Homework
Individual homework will be submitted using the WebAssign homework and course management system. Assignments will be made almost every class day and will typically consist of 3 or 4 exercises from the textbook. They will be nominally due 30 minutes before the next class meeting, with extensions (with a small point penalty) automatically available. Homework exercises will be absolutely due one week after the nominal due time. WebAssign will automatically grade your numerical answers as soon as you submit them, and you will have 3 chances (‘submissions’) to get each question right.
One “showcase” homework problem per week will be assigned for submission in writing on paper, for hand grading, in addition to being part of the WebAssign assignment. WebAssign scoring of the showcase problem will focus on the correct answer. The hand grading of the showcase problem will stress clear presentation of the underlying physics and development of the detailed solution.

Exams
Three hour exams are scheduled throughout the semester. The specific dates and topical coverage for the three hour exams is listed in the course schedule posted in the Schedule folder in Course Information. The third hour exam is scheduled at the University-mandated time and date for a final exam. Our final (third) exam will not be explicitly comprehensive, i.e. it will not cover material from the entire course over the semester, except to the extent that the physics of phenomena covered in later chapters depends on the physics covered in earlier chapters.
Hour exams are presently scheduled for February 16, March 30, and May 2. The February and March exams will be held during lab meeting time, in Room 203, and will be at least partially computer-administrated.

Quizzes
Quizzes will be regularly, but somewhat randomly, scheduled during lecture time, and will typically consist of three short questions with multiple choice of answers,
administered by clickers. The content of the quizzes will be based on the reading assignment for the day, and will test for familiarity with, rather than deep understanding of, the reading.

**Clicker Questions**
Clicker questions will be designed to guide discussion during lecture. They will not be graded, but responses will be recorded and contribute to the "clicker question" component of the grading procedure as “participation points."

**Laboratory**
Laboratory will be conducted in Room 203 of Nielsen Physics Building. Lab reports will be graded by the lab instructor and a final lab grade determined by that instructor will be incorporated into the final course grade as detailed in the **Grades** section below.

**Grades**
Final course grades will be determined from a weighted average, as follows:

<table>
<thead>
<tr>
<th>Component of grade</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hour exams (3 @ 15% each)</td>
<td>45%</td>
</tr>
<tr>
<td>Quizzes</td>
<td>10%</td>
</tr>
<tr>
<td>WebAssign homework</td>
<td>20%</td>
</tr>
<tr>
<td>Lab</td>
<td>20%</td>
</tr>
<tr>
<td>Clicker questions</td>
<td>5%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

Grades will never be curved downward – if everyone in the class does well, everyone can get an A. It may happen that a particular exam is unexpectedly difficult and no one does well; in that case, the grades for that exam may be curved upward, or the grades may be left as is, and consideration of a curve left for final grade time.