Principles of Physics I – Fall 2011
PHYS-110G
Lecture: TF 08:55 – 10:10
Lecture room: MCK 108; Laboratory room: SCAN 111
Department of Physics, American University

Personnel: Email addresses and most recent information are on Blackboard course site (Bbd).

<table>
<thead>
<tr>
<th>Name</th>
<th>AU Position</th>
<th>Course Responsibility</th>
<th>Office or Meeting Space</th>
<th>Office Hours or Meeting Times</th>
<th>Phone and email</th>
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<td>TBD</td>
<td>Undergraduate Student</td>
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**Course Overview:** Principles of Physics I (PPI) is the first part of a two-semester introduction that surveys many topics in classical physics. Specifically, PPI covers the topics of kinematics and dynamics of simple objects, conservation principles, properties of matter, and thermodynamics. The wonder and utility of science is that it fulfills three roles: it predicts, describes and explains. In physics, the language of prediction, explanation, and description is math, so great focus will be given to the mathematical representations and relations of physical observables. The course will rely on critical thinking; understanding and progress can only be made by combining theoretical insights with real-world experiments and practical knowledge. Additionally, the course will attempt to provide a larger context for the topics covers, such as how they fit into the broader history of scientific and intellectual thought and how physics discoveries have impacted society.

The course presupposes a solid mathematical background through pre-calculus and concurrent enrollment in (or completion of) a first semester introductory calculus class, such as MATH-221.

**Course Goals:**

- Students will acquire conceptual understanding of the topics of the course. This requires that the students will be conversant in the vocabulary of the subject and recognize that mathematical concepts are necessary for the relational understanding of physical observables.
- Students will gain experience in quantitative problem-solving. Students will exploit a variety of mathematical skills, including algebra, vector arithmetic, trigonometry, graphical representation and interpretation, statistical analysis, and calculus.
- Students will develop their critical thinking skills in a scientific context. They will be able to estimate appropriate physical scales and develop appropriate scientific models. In this process, they will become aware of the strengths, boundaries, and limitations of specific physical theories.
Students will better understand the relation of physics to other scientific disciplines, broader intellectual thought, and to technology and other societal impacts.

**General Education Information:** PPI is one of eight foundation courses in Curricular Area 5 (The Natural Sciences), Cluster Two (The Physical World) in the University’s General Education Program. This course is the first of a two-course sequence. Students who take PPI frequently take Principles of Physics II to fulfill both the General Education requirements as well as a major requirement. The second level courses which may be taken following PPI to complete the Curricular Area 5, Cluster Two sequence (if you have the necessary prerequisites) are:


**Required Course Materials:**

- **Text:** *Physics for Scientists and Engineers*, Second Edition, Randall D. Knight, Pearson-Addison Wesley
- **Student Workbook:** At the bookstore, the textbook comes bundled with the Student Workbook.
- **MasteringPhysics:** We will be using this website to host our on-line pre-class warm-up activities. This software takes a little getting used to, but I have found that students really like it once they have figured it out.
  - To register, follow the instructions in the Assignments section of Blackboard. You will either need an access code (which comes free in an insert with new textbooks) or you will have to purchase access.
  - After you have registered, to enroll in the course, use the course ID: **HARSHMANPPFALL2011** and use your AU ID number for the student ID on the enrollment page.
  - You should try to enroll in MasteringPhysics today; don’t put it off until tomorrow! Contact me or come to my office hours if you need help.
- **Laboratory manual:** The laboratory manual will be distributed as pdf files on Blackboard. You are responsible for printing them out and reading them before lab.
- **Calculator:** Scientific calculator that can do trigonometric, exponential, and logarithmic functions; graphing capacity not required; graphing capabilities cannot be used during in-class tests.

**Course requirements and grading:** Your final grade will be based on the following:

- Workbook Assignments 5%
- Practice Problems 5%
- MasteringPhysics 20%
- Lab grade 25%
- Test 1 13%
- Test 2 15%
- Final 17%

**Grading scale:** Your grades and the class average grades will be released periodically throughout the semester. Students at risk for receiving a C- or lower will be notified midway through the semester. The grading scale below is guaranteed to be the maximum requirements for a grade, but may be adjusted lower to account for class performance. Remember that if you take the course pass/fail, that C- counts as a fail. Also, see attendance policy.

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<tr>
<th>Grade</th>
<th>Percentage</th>
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<tr>
<td>A</td>
<td>&gt; 93%</td>
</tr>
<tr>
<td>A-</td>
<td>&gt; 90%</td>
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<tr>
<td>B+</td>
<td>&gt; 87%</td>
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<tr>
<td>B</td>
<td>&gt; 83%</td>
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<tr>
<td>B-</td>
<td>&gt; 80%</td>
</tr>
<tr>
<td>C+</td>
<td>&gt; 75%</td>
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<tr>
<td>C</td>
<td>&gt; 65%</td>
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Attendance policy: I will take attendance everyday at the beginning of class using zappers. If you miss the zapper check-in, you must sign the paper in front for late arrivals. After three unexcused absences or six late arrivals (or any proportional combination), your grade will be lowered one level, and lowered another level for every three additional unexcused absences or six tardies (or any proportional combination). Severe illness, religious observance, University business, and family emergency are acceptable reasons for missing class. I have the right to request reasonable documentation, in accordance with University policy. For a planned excused or unexcused absence, notify me as far in advance as possible.

Workbook assignments: Almost every day that lecture meets (25 times out of 28), there is a reading assignment in our textbook. You are required to do the reading before class. The text is accompanied by a student workbook. You must turn in the exercises in the workbook that are coordinated with the reading assignment; they will be collected at the beginning of class. You may not copy the workbook solutions from someone else or the internet or pay someone to do it; those are violations of the AIC. Optional Supplemental Instruction tutorial sessions and GEFAP tutorial sessions (see below) will be held several times a week with a teaching assistant to help you complete this assignment, and we can discuss this in office hours. These will be checked and given two checks for being mostly complete and correct; one check for partial credit; or no checks for insufficient effort. Thirty checks will be required for the full 5% of your grade, and partial credit and bonus points will be awarded proportionally, for example: 15 checks is 2.5%; 45 checks is 7.5% (which means a 2.5% bonus). No late assignments will be accepted, except in the case of excused absences. You can turn work in early to SCAN 108 during business hours in my mailbox.

Practice Problems: Ten Tuesdays during the semester, you will turn in a practice problem at the beginning of class. These problems are similar to problems that will appear on your tests. They will be posted on BB. You should try and solve these problems on your own, but you may consult real or virtual resources. You are not forbidden from consulting with humans, but you are strongly discouraged to do so. Tutorial sessions and office hours are not an appropriate place to talk about these problems. You may not copy the practice problem solutions from someone else or the internet or pay someone to do it; those are violations of the AIC. These will be graded on a four point scale: two points for correctness (including units, where applicable), one point for presentation, and one point for including at least one informative diagram, graph or picture. Thirty points will be required for the full 5% of your grade, and partial credit and bonus points will be awarded proportionally, for example: 15 points is 2.5%; 36 points is 6% (which means a 1% bonus). No late assignments will be accepted, except in the case of excused absences. You can turn work in early to SCAN 108 during business hours in my mailbox.

MasteringPhysics: Eleven times during the semester assigned homework will be required to be turned in using the MasteringPhysics on-line homework system. There is also one optional assignment MP0 that is worth a few bonus points. You may work with others to complete these assignments, but you must complete your own work. You may not copy the homework from someone else or the internet or pay someone to do it; those are violations of the AIC. You are encouraged to attempt all the homework on your own before seeking assistance, as that will provide the greatest practice for the tests. Optional Supplemental Instruction tutorial sessions and GEFAP tutorial sessions (see below) will be held several times a week with a teaching assistant to help you complete this assignment. Your best eight HW count toward your homework score, and the scoring system will be explained on-line at the MasteringPhysics website. The homework assignments will be due at 8:00 AM on the due date for full credit, and each day late reduces the credit by 25%.

Laboratories: Eleven times during the semester you will meet during the laboratory time in SCAN 111 to perform experiments. Your exact lab meeting time is determined by your course section. You are expected to have read the section in the laboratory manual and completed the pre-lab assignment for that week’s experiment before you arrive. Each week that the lab meets you will complete a laboratory report for that experiment to be turned in the following week to the lab instructor. Occasionally the material covered in the experiment for the week will lead the lecture; this is normal. Read the lab syllabus on BB for more details about pre-labs, lab reports, and attendance and grading policies.
Test 1, Test 2, and Final: There will be two tests and a final. The tests will be held in the lab room SCAN 111 during your weekly lab period. The final will be held in the lecture room MCK 108. All exams will be closed-notes and closed-book and will consist of multiple-choice questions, short written answers and free-response problems. Sample test questions (a mock test) will be provided before each exam. Test 2 and the final are both cumulative. Test results and answer keys will be posted on Blackboard.

Regrades: If you feel a test has been misgraded, DO NOT WRITE on it. Write a note on a separate piece of paper and give it to me in class or office hours or slip it in my mailbox in SCAN 108 within one week of the date it was returned. The assignment will be regraded more carefully. Note: your grade may go up OR down based on the regrade.

Communication: This course will use the Blackboard system of American University for distribution of information outside of class time.

Email: You must have an American University email account to use this system; if you use an email provider other than American, forward your American mail to that account. Check your email and the class website of Blackboard frequently to stay up-to-date. I usually respond twice a day to email, once in the morning and once in the late afternoon.

Blackboard: On-line surveys will be taken through Blackboard, links to on-line homework and other surveys will be posted on Blackboard, on-line discussion sessions will be managed through Blackboard, and solutions to practice problems, homework and tests will be posted on Blackboard. Please make use of the discussion boards to ask homework questions, vent frustrations, share neat ideas or websites, etc. This should be one of the first places you look for help with MasteringPhysics or practice problems or for questions about the class. I will check it frequently.

Privacy: For the record, I can track Blackboard viewing, i.e. count the hits on each page and see who accessed it. However, you can post on the discussion board anonymously, and I really can’t see who said it.

Etiquette: Express yourself freely in this class, in email and on Blackboard. However, be respectful and polite to your fellow students.

Succeeding in this class and getting help: To succeed in this class, it is imperative that you interact with the material every day. Physics is like a foreign language, you cannot learn it just from attending class. Make sure you do the readings before class and lab, do all the warm-up quizzes and homework, solve the sample test questions, attend SI sessions, come to office hours. This is a four-hour class, so you should spend at least eight hours a week outside of class time thinking about and practicing physics.

On-line discussions: On Blackboard there will be on-line discussion groups. You can you this to ask me questions publicly, discuss homework with your peers and voice concerns and opinions about the material and the class.

Supplemental Instruction (SI) sessions: SI is group tutoring, offered twice a week, facilitated by a fellow student who has done well in the class in the past. SI will complement what you are learning in class by providing strategies for learning the material, clarifying concepts and generally acting as a guide to help build your understanding of and confidence in the class. It’s also a good place to get homework help. It is voluntary and confidential and has a good track record as a program that helps students succeed in difficult courses.

Other Blackboard resources: Other good stuff will be posted on our course’s Blackboard site. Check it out regularly.

Office hours: You are welcome to come to office hours. We have a good time there. If you can’t make any of the times listed above, call or email me, and we can work something out. The grader will also have office hours about once every week.

Students with disabilities: You should be registered with the University, who will send me a letter describing you special needs. We will use the University on-line system for making accommodations.

Academic Integrity Code: Read it and follow it. It is your responsibility to know it and abide by it. Follow all instruction given here or given on a specific assignment or the full due process of the AIC will be invoked.
“Tough-Love Manifesto”

I read an article “A Tough-Love Manifesto for Professors” by an anonymous professor (pseudonym: Thomas H. Benton) in the Chronicle of Higher Education on June 6, 2006. Here is what he suggested that all professors include in their syllabus. I agree with most of these ideas, but what do you think? Put your opinions on the discussion board. The following is a direct quotation:

I. Students are not customers. Teachers are not employees.

II. Students and teachers have obligations to each other.

III. Here is what I expect from students:
   - You will treat everyone in the class, including the professor, with the respect due to all human beings.
   - You will attend every class, give your full attention to the material, and conduct yourself in an appropriate manner.
   - You will agree to do the work outlined in the syllabus on time.
   - You will acknowledge that previous academic preparation (e.g., writing skills) will affect your performance in this course.
   - You will acknowledge that your perception of effort, by itself, is not enough to justify a distinguished grade.
   - You will not plagiarize or otherwise steal the work of others.
   - You will not make excuses for your failure to do what you ought.
   - You will accept the consequences -- good and bad -- of your actions.

IV. Here is what students can expect from me:
   - I will treat you with the respect due to all human beings.
   - I will know your name and treat you as an individual.
   - I will not discriminate against you on the basis of your identity or your well-informed viewpoints.
   - I will manage the class in a professional manner. That may include educating you in appropriate behavior.
   - I will prepare carefully for every class.
   - I will begin and end class on time.
   - I will teach only in areas of my professional expertise. If I do not know something, I will say so.
   - I will conduct scholarly research and publication with the aim of making myself a more informed teacher.
   - I will return your assignments quickly with detailed feedback.
   - I will pursue the maximum punishment for plagiarism, cheating, and other violations of academic integrity.
   - I will keep careful records of your attendance, performance, and progress.
   - I will investigate every excuse for nonattendance of classes and noncompletion of assignments.
   - I will make myself available to you for advising.
   - I will maintain confidentiality concerning your performance.
   - I will provide you with professional support and write recommendations for you if appropriate.
   - I will be honest with you.
   - Your grade will reflect the quality of your work and nothing else.
   - I am interested in your feedback about the class, but I am more interested in what you learned than how you feel.