

Physics 121: Fundamentals of Physics I

Fall 2010 — Professor Shawhan

Course web site with latest information: <http://tinyurl.com/shawhan121>

Overview

The purpose of this class is to give you a deep understanding of the fundamental principles that govern physical systems, how they may be used to accurately predict the behavior of objects when they interact with their environment, and how these simple principles lead to more complex phenomena. Topics will include Newton's laws of motion, applications to one- and two-dimensional systems, gravity, elasticity, rotational motion, conservation of momentum and energy, fluids, temperature, and thermodynamics.

Lectures will be given on Mondays, Wednesdays, and Fridays from 10:00–10:50 in room 1412 in the Physics lecture halls wing. These sessions will actually be fairly interactive—please come ready to think and respond, not just to take notes!

You will also have a one-hour **discussion session** and a two-hour **lab session** each week, with a few exceptions: in the first week of the semester you'll have discussion session but not lab, and in the second week and the week of Thanksgiving you won't have either. The discussion session, which meets in room 3301, is structured in a “tutorial” manner to help you explore and solidify the physics principles and their consequences, collaborating with your classmates and TA. The lab sessions, in room 3306, present you with rather open-ended investigations that you must plan, carry out, evaluate and explain in teams—there is no “cookbook” for them! You must attend the specific discussion and lab sessions for the course section you registered for. If you miss your normal day for a valid reason (such as illness), you *might* be able to attend a later discussion session that week; be sure to check with me first. At the end of the semester there will be time available to make up *one* lab session if you missed one for a valid reason during the semester.

Required and optional materials

The **textbook** for this course is “College Physics: A Strategic Approach” by Knight, Jones and Field, published by Addison-Wesley / Pearson. It is available either as a single hardcover volume or as two paperback volumes. I recommend the paperback option because it is easier to carry around one of those than the big hardcover, but either is OK. PHYS 121 will cover material corresponding to the first 13 chapters, which is all in volume 1 of the paperback edition. The current edition of the book is the second edition, but the first edition is very similar and is an acceptable substitute that you could obtain used; however, before you run out and buy a used copy, carefully read below about bundled items which affect the economics of buying a new versus a used book:

New copies of the textbook are available in a number of packages, bundled with various add-ons, with different ISBN numbers. The most important add-on for this course is MasteringPhysics, a web-based homework system that is a *required* part of this course. When MasteringPhysics access is purchased with a book, it is valid for two years and includes an “eText” version of the book that you

can read online if you don't have your book with you. MasteringPhysics access can also be purchased separately at masteringphysics.com for \$50 for a two-year subscription, though that does *not* include the eText. So that \$50 would be an additional cost if you buy a used copy of Knight/Jones/Field that does not include an unused MasteringPhysics access code.

We have arranged for the bookstore to sell a bundle which includes the volume 1 paperback, MasteringPhysics (with the eText), a workbook, and a study guide book called "Get Ready for Physics". In this bundle, MasteringPhysics added just \$8 to the cost, and the publisher threw in the workbook and study guide at no extra cost. The workbook and study guide are *not* required for this course, but some students may find them helpful. This ISBN for this bundle is 978-0-321-74134-9. Besides the bookstore, it is also available directly from the publisher at mypearsonstore.com.

The minimal bundle for PHYS 121, consisting of just the volume 1 paperback plus MasteringPhysics access (including the eText), has ISBN 978-0-321-59850-9. Other bundles (with different ISBNs) may be available which include just the workbook or just the study guide. Note that the eText contains the *entire* book even if it is bundled with just volume 1.

You may be tempted to consider buying an electronic version of the book *instead of* a printed copy, either through MasteringPhysics (for an extra charge) or through coursesmart.com. However, I strongly recommend buying a printed book instead of just an eBook subscription! First of all, the higher-quality type in a printed book is easier to read than pixels on a screen, and a physical book is easier to flip through. Second, the eBook subscriptions expire after 18 or 24 months, and then you have nothing to show for the money you spent. A printed book can, at least, be sold if you don't want to keep it.

In addition to the textbook, you will need a copy of the "Physics 121 Tutorials and Laboratories" manual, which is a U. of Maryland custom book published by Wiley with ISBN 978-0-470-10771-3.

Finally, for this course you will need to have a "clicker", or else a web-enabled phone (or other device) with a ResponseWare license that you can use in place of a clicker. You will also need to register your clicker (or other device) at <http://my.umd.edu> so that it is associated with your student ID. For details and purchasing information, go to <http://clickers.umd.edu/> and click on the "Students" tab. The "RF-LCD" model is currently preferred, though the older RF and XR models will also work if you already own one.

To summarize: the *required* materials for PHYS 121 are the textbook; MasteringPhysics access; the tutorials/labs manual; and a clicker or suitable alternative.

MasteringPhysics registration and enrollment

The regular textbook bundle includes a slim cardboard "Student Access Kit" with an activation code for MasteringPhysics. Alternatively, you can purchase a MasteringPhysics subscription separately at www.masteringphysics.com. *Important:* If you purchase a subscription online, be sure to specify the standard textbook for the course: Knight/Jones/Field, College Physics, **2nd edition** (even if you are using a printed copy of the 1st edition book); otherwise the MasteringPhysics registration system will not let you enroll in our course. Once you have registered, you can log in and "join" our specific

course. Enter your Student ID (the 9-digit number on the front of your University ID card, beginning with either “10” or “11”) and the Course ID: SHAWHAN2010 .

How assignments will be graded

MasteringPhysics automatically calculates grades based on your answers (except for free response answers), but the rules for giving partial credit can be confusing. Here is how I plan to set up the grading:

- You get a maximum of six attempts to answer each part. For symbolic or numeric questions, each wrong answer before the correct one reduces your score on that part by 10%. For multiple-choice questions, each wrong answer before the correct one reduces your score by the fraction $1/(n-1)$, where n is the number of answer choices.
- There is no penalty for opening a hint. However, if you answer the part correctly *without* opening a hint, you get a *bonus* of 3% per unopened hint. (You can even look at the list of hint topics without actually opening any of them.)
- If you open a hint that contains a question, and you answer that question incorrectly, then your score is reduced by 10%. There is no penalty for leaving a hint question unanswered.

You can click on “Grading Policy” link at the top of an assignment to check the settings that apply to the assignment. If you think you have lost points unfairly for some technical reason, let me know what happened and I will look at your answers and make an adjustment if appropriate.

Graded work

Homework will be assigned each week. Some questions will use the MasteringPhysics online system, while other questions will be posted on the web to be answered on paper and turned in.

Lab work will also be graded, and you will earn points for **participation** in class (by responding to clicker questions, etc.) Three **midterm exams** will be given in class, plus a **final exam** at the end of the semester.

Course grade:

10%	Participation
20%	Homework
20%	Labs
30%	Midterm exams (10% each)
20%	Final exam

Getting help

The **Course Center** (room 0208 in the physics building) is a dedicated space for you to meet and work on physics problems, especially in groups. There are tables and whiteboards, as well as a variety of texts. It is open for many hours each week, staffed by the TAs and lecturers from all sections of PHYS 121; the exact schedule will be posted on the course web site. Feel free to come by any time for help, though it may be best if you can come when I or one of the TAs working with our class (John Biddle, Aaron Hagerstrom, Lora McMurtrie or Matt Severson) are there.

The **Slawsky Physics Clinic** (room 1214) is staffed by volunteers who are retired physicists. Ralph Vendemia is particularly tuned in to PHYS 121. His regular hours are Mondays, Wednesdays and Fridays from 10:00 to 3:00.

The **Guided Study Session** program is provided by the university's Learning Assistance Service. It offers FREE, regularly scheduled study sessions. GSS sessions are led by undergraduate students who have previously taken the course and demonstrated academic competency in the subject area. GSS leaders will share their approach to success in the course and help the groups to review lecture material, work through homework and problem-solving exercises and review for exams. Guided Study Sessions for Physics 121 will be led by Nick Caffes on Mondays at 4:00 and on Thursdays at 5:00, both in room 2201 of the chemistry building.

Course policies

Late or missed work:

Assignments must be completed and turned in when they are due unless you have a valid excuse (e.g. illness) following university policy, in which case an extension will be granted. Please let me know your situation as soon as possible, and I will tell you if I need documentation for the reason for your absence. Otherwise, no credit will be given for work turned in late. Exams must be taken at the scheduled time unless you have a valid excuse, and documentation *will* be required. If you do miss an exam, I will schedule a make-up time with you (with a different set of questions).

Policy on collaborating:

Working together with other students is part of the course; in fact, the tutorials and labs are specifically designed around teamwork. Working together on the homework is also encouraged, but you must turn in your own work. This simple rule applies: **Never look at someone else's written solution.** Talking about how to work the problem is fine if it helps you to understand it better, but direct copying is strictly forbidden.

Honor Code:

The University of Maryland has a nationally recognized Code of Academic Integrity, administered by the Student Honor Council. This Code sets standards for academic integrity at Maryland for all undergraduate and graduate students. As a student you are responsible for upholding these standards for this course. It is very important for you to be aware of the consequences of cheating, fabrication, facilitation, and plagiarism. For more information on the Code of Academic Integrity or the Student Honor Council, please visit <http://www.studenthonorcouncil.umd.edu/whatis.html> .

Religious observances:

If you need to miss class, a homework deadline, or an exam due to a religious observance, please notify me in advance—preferably at the beginning of the semester.

Students with disabilities:

Accommodations will be provided to enable students with disabilities to participate fully in the course. Please discuss any needs with me at the beginning of the semester so that appropriate arrangements can be made.

Weather and emergency closures:

If the University is closed due to weather or some emergency situation on a day when homework is due, then that homework must be turned in at the beginning of the next class when the University is open. If the University is closed on the scheduled date of an exam, then the exam will be given during the next class period when the University is open. If the University is closed on any non-exam day, including just before an exam, then the exam will still be given according to the original schedule. In these or other exceptional circumstances, I will attempt to send out information by email.

Contact information

Prof. Peter S. Shawhan, room 4205B in the Physics Building, 301-405-1580, pshawhan@umd.edu

TAs:

Section	Disc+Lab Time	TA	Email	Office	Phone
0101	Wed 4:00-6:50	Matt Severson	mseverso@umd.edu	0104	301-405-8577
0102	Mon 3:00-5:50	Aaron Hagerstrom	ahag@umd.edu	0220	301-405-5969
0103	Tue 10:00-12:50	Aaron Hagerstrom	ahag@umd.edu	0220	301-405-5969
0104	Tue 12:00-2:50	John Biddle	jbiddle2@umd.edu	0104	301-405-8577
0105	Wed 12:00-2:50	Matt Severson	mseverso@umd.edu	0104	301-405-8577
0106	Thu 8:00-10:50	Lora McMurtrie	lorajm@umd.edu	3103B	301-405-6189
0107	Mon 11:00-1:50	Lora McMurtrie	lorajm@umd.edu	3103B	301-405-6189
0108	Thu 12:00-2:50	John Biddle	jbiddle2@umd.edu	0104	301-405-8577