

Physics 101: How the “World” Works I

Fall 2008

General Information

Course Time and Place: Mon. and Wed. 2:15-3:35 pm in Stolkin Auditorium, Physics Building
 Instructor: Dr./Prof. Schwarz
 Office: 215 Physics Building
 Phone: 315-443-3887
 E-mail: phy101.fall2008@yahoo.com
 Course Webpage: <http://physics.syr.edu/courses/PHY101.08Fall/index.html>
 Office Hours: Monday 3:45pm-5:30pm or by appt.
 Course Secretary: Mrs. Arlene Johnston, 111 Physics Building, 3-1915

Dr./Prof. Schwarz’s Top 7 Reasons to Take PHY101

The following list was inspired by comedian David Letterman’s Top Ten List. Since I do not have a staff of writers backing me, I decided to stop at seven items. Perhaps all of you can fill in the rest.

(7) So you can roll your eyes when Jean-Luc and the crew of the Starship Enterprise come up with a plan to save the universe. Of course, you may already do so.....

(6) For those of you who want to become doctors, you want to do well on the MCATs....don’t you?

(5) To climb inside the brains of Newton, Joule, Maxwell, Boltzmann, and Einstein. Remember, it takes one to know one. (After all, Albert Einstein was Time Magazine’s Person of the *Century*, not just Person of the Year).

(4) For those of you who own a car, you may become better friends with your car mechanic since you will understand how an engine works, at least in principle. Not that you necessarily want to become better friends with your car mechanic....You will also be to understand how other machines work such as a Xerox machine. Xerox machines have always fascinated me for some reason.

(3) If you can understand physics, you can understand anything...well, except maybe algebraic cohomology, but who cares about algebraic cohomology anyway.

(2) So when you are in a room crowded with people and want to create some space between yourself and those surrounding you, you can easily start talking about energy, entropy, dark matter and other physics concepts and watch the retreat happen.

(1) So you can answer the question, “How many physicists does it take to change a lightbulb?” and many other related (and not so related) questions.

On a more serious note, the goal in this course is for you to learn something essential about how our “world” works in terms of a few fundamental laws. Note that “world” is in quotation marks because we will sometimes abstract away some of the intricacies of the actual world and play with an idealized world, i.e. accuracy is usurped by simplicity. So, you will learn about the basic objects of which the world is made, what rules govern their behavior, and how are the parts related to one another. This process will take us through some key conceptual issues in mechanics, electricity and magnetism, and thermal physics. This journey will not only help you build your scientific understanding of the world around you, it will help you hone the skills necessary for critical thinking and problem solving in general. And we all love to solve problems, don’t we! :)

No prior knowledge of physics is required, although previous knowledge may help you to see certain concepts in a richer context.

Finally, PHY101 is on the Basic List in Natural Sciences and Mathematics of the Liberal Arts Core, and satisfies the requirement for a course with a laboratory, though we will call them studios.

Textbook

The **required** textbook for the course is a book with the very original title, *Conceptual Physics Fundamentals* by Paul G. Hewitt. Most of the homework will be assigned from the questions in the back of each chapter so it would be in your best interest to have easy access to a copy. Also, as I lecture, I will list the relevant chapters since most of my lectures will draw on inspiration from reading this book.

Rationale Behind Extra Fees: Lab Course Fee and Clicker Fee

To support the laboratory, you have been charged a course fee of \$25. This fee helps pay for (i) handouts and lab manuals which are distributed to you, and (ii) supplies, small pieces of apparatus, and maintenance for the laboratory equipment.

As for the clickers, answering questions during class will help me better gauge if I am getting my point across or not, so please bring them to class from the second lecture onwards. Also, there will be points assigned for answering questions. FYI, the points are *not* based on whether you have answered the question correctly or not, just that you answer the question the best way you see fit.

Course Work

Aside from attending the two lectures a week in Stolkin, most weeks, your studio section will meet. In PHY101, studios serve the function of a combined laboratory and recitation. This is a key time to go over difficult concepts, work hands-on with the key ideas in the course, and discuss the homework. In other words, studio time is designed to solidify your understanding.

Almost every week there will be a homework assignment. Working the homework problems is one of the most important activities of PHY101, since that is where you clarify concepts and test your understanding. The homework sets will be handed in during your studio, and your work will be graded. Exams will be drawn to *some* extent from the homework problems, so doing the homework is also the best way to prepare for exams.

At the end of each week's studio, you will also hand in answers to a few questions based on the lab activity of that week's meeting. This is the other most important learning activity of the course, aside from homework help. It will be graded as well.

Mid-term and Final Examinations

There will be two mid-term exams, held in lecture on the days given in the Course Calendar. No make-up exams will be given. If you have to miss a mid-term exam for a legitimate reason, you will need to take an oral examination with Prof. Schwarz.

The Final Exam will be held on Friday, December 12 from 8:00 AM to 10:00 AM. No make-up Final Exam of any form will be offered for any reason.

All material taught in this class, including lectures, labs, homework, clicker questions, and lecture demonstrations is subject to be covered on the mid-terms and the final exam.

Assistance

Every member of the staff of PHY101 is committed to giving you every opportunity to succeed in this course. If you need help, please speak to one of us. We will also be happy to discuss any course topic in more detail.

Prof. Schwarz will hold weekly office hours on Mondays from 3:45 - 5:30 PM in Room 215, Physics Building. If those regular office hours turn out to be inconvenient for you, please send an e-mail message to phy101.fall2008@yahoo.com or call 3-3887 for an appointment.

The other members of the course staff will announce their Physics Clinic hours shortly. The Clinic is located in Room 113 and is open Mon.-Fri. from 10AM-8PM with a few exceptions. Any TA on hand at the Clinic (whether they are teaching this course or not) should be able to answer your PHY101 questions.

Mrs. Arlene Johnston is available in Room 111, Physics Building, from 8:00 A.M. to 4:30 P.M. weekdays. She is the person to see for signatures on add/drop forms, or for other administrative matters. If she is ever unavailable, please go to the Physics Department Main Office, Room 201 Physics Building, for assistance.

Grading

Grades will be calculated based on your scores on various course activities in the following proportions: Mid-term exam 1: 15 percent; mid-term exam 2: 22 percent; Final exam: 34 percent; homework: 10 percent; lab reports: 15 percent, clicker responses: 4 percent.

Your course grade will be determined from your total score at the end of the semester. The grade limits will not be stricter than the following: 60 percent for a C-, 80 percent for a B-, and 90 percent for an A-. More detailed breakdowns will be determined at the end of the semester.

While no late homework or lab reports will be accepted, the lowest homework assignment grade and the lowest lab report grade will be dropped.

A Note About Working with Friends and Academic Integrity

Working with friends can be very helpful in learning an interesting subject like physics. We encourage you to find other classmates with whom to study. However, when it comes time to write up your homework, **the final work you turn in must be your own**. You should never copy anybody else's work, or even paraphrase it. Copying/paraphrasing is done by people with vacuous minds and people with vacuous minds will not end up going very far in life. Moreover, it is against school policy and can ultimately result in expulsion. If you have not read over SU's academic integrity policy, it can be found online at http://supolicies.syr.edu/ethics/acad_integrity.htm. Enough said about that!

Academic Accommodations for Students with Disabilities

Students who are in need of disability-related academic accommodations must register with the Office of Disability Services (ODS), 804 University Avenue, Room 309, 315-443-4498. Students with authorized disability-related accommodations should provide a current Accommodation Authorization Letter from ODS to me (Dr. Schwarz) and we will review those accommodations together. Accommodations, such as exam administration, *are not provided retroactively*; therefore, planning for accommodations as early as possible is necessary. Please goto <http://disabilityservices.syr.edu> for further information.

General Tips for Making PHY101 a Success

Set aside time to study Please set aside anywhere from 4-6 hours a week outside of lectures and studios for studying. Most lectures will build on previous material, so it is important not to fall behind.

Attend the lectures I will be exposing you to new concepts throughout the course. They are not always simple. While the book is rather clear, I will relate the new concepts to more familiar ones when possible. These connections are important and will serve to unify the course.

Not only attend, but actively participate in lecture and studio Ask questions, ask questions, ask questions. Need I say more?

Do the homework Lectures and studios will help set the stage, but only by answering questions and doing the problems effectively does the deep understanding arrive! Get help early and often.