

General Physics 95.103 Fall 2012

Information / Course Policy

Lecturer and Coordinator : Dr. Silas Laycock
North Campus, Olney 0127
978-934-3777
Silas.Laycock@uml.edu

Course Websites: www.masteringphysics.com Course Code: GPHYS2012F
<http://faculty.uml.edu/slaycock/95.103>

Co-Requisite 96.103 General Physics Laboratory.

Course Schedule

Lectures: Monday 8AM, Wednesday 8AM

Recitations: Two Per Week. See ISIS for your location, time, and section instructor.

Independent Study: 6 hrs per week

The Course is structured in weekly blocks of two lectures (MW@8am) and two recitations (MW or TuF). Each week usually corresponds to a chapter in the text.

Materials:

- Textbook: "Physics" by Giancoli. 6th edition, for algebra based courses. Chapters 1-15.
- MasteringPhysics account (comes with Giancoli, or buy online with or without ebook.
- Clicker (i>clicker) loaned to you by the Physics department.

Course Outline

General Physics I. covers a lot of ground, as it is nothing less than a survey of the inner workings of the physical world. In order to make this course useful to you, I will focus on *Concepts, Tools, and Understanding*. The course will feature frequent examples and demonstrations relating to your own fields of study and interest; especially nature and physiology.

Unlike many other subjects, you won't be able to pass physics by memorizing facts; problem solving is a key physics skill that employers pay a premium for out in the real world. This means that your homework and recitation problems are vital to gaining proficiency.

At every stage, YOU need to ask the following questions:

1. Why is this useful?
2. Where did it come from?
3. How does it fit into what I already know?
4. How can I use it to solve a problem I care about?

In the first part of the course, we develop the laws of motion in a straight line, add forces, work, energy, momentum, and finally add rotation and circular motion.

In the 2nd section we look at some mechanical properties of matter (including fluids), and complex structures such as buildings and the human body.

In the 3rd section we cover vibrations and waves, with sound as our main example.

Finally in the 4th section we explore the kinetic theory of heat, including temperature, thermal properties of matter, and introduce the concepts of thermodynamics.

Lectures

Please read the relevant chapter before each lecture - Clicker questions based on the reading will be interspersed throughout the lectures, and comprise 10% of your final grade. If you know that you will miss a lecture for unavoidable reasons, please contact me in advance.

Homework - Mastering Physics

There is a 2-part weekly homework assignment, which should form the majority of your independent study time. Part 1 is a simple “reading quiz” based on reading the upcoming chapter before class, Part 2 concentrates on developing problem solving skills.

Bring your work to the recitation, where we will work through some of the problems. Be prepared to show your work to the instructor. Homework problems focus on material introduced in the preceding two lectures; but may draw on any prior material, and might occasionally require some independent research.

We use the “Mastering Physics” online system. Weekly homework is assigned using Mastering Physics, and you will be entering your answers to the problems on the computer. Most of the Mastering problems are drawn from the Giancoli text, however MP randomizes the values, so that although you all see the same problems, the numerical answers will be different from those of your classmates.

Mastering provides hints, and collects and assesses your answers. Solving the problems will require extensive paper-pencil-calculator work. The expectation is that you will reach the correct answer for all of the problems! –you may use several attempts, online hints, and help from your study group, instructor or tutor.

Homework is due on the dates shown in the master schedule, usually Monday morning. The deadlines are programmed into the Mastering software, and will not be extended (the usual exceptions apply). This strict approach to homework deadlines is to help you! It will prevent you falling behind and building up a backlog of work.

Hand in your workings (on standard size, ring-binder paper) at the Monday 8am lecture. It will be returned to you in Recitation.

Tutoring

Tutors are available free of charge at the University's "Centers for Learning" (<http://www.uml.edu/class/Tutoring/tutor.html>), and in the Physics Department tutoring room, located adjacent to the Dept office on the 1st floor of Olney Hall.

Recitations

Recitations provide an opportunity for you to interact with your instructors in a smaller group (<20 students). This will provide you with the opportunity to discuss concepts and benefit from intensive coaching in problem solving.

Recitation sessions will involve solving by hand, selected complex problems from Giancoli, plus some special ones provided by the instructor. A short quiz will be administered during recitation (for credit). Most importantly your instructor will provide guidance on the homework problems, this should be a big incentive to attend. You should attempt the MasteringPhysics homework before class we can see your progress, and tailor the recitation accordingly.

Reading

Read the Giancoli chapters indicated in the master schedule before each lecture. So I suggest you spend an hour familiarizing yourself with the upcoming material sometime during the weekend. Grab a coffee, and enjoy it, free from the pressure of solving yet another problem. Maybe make some notes, don't worry if you don't understand it yet, you will get a lot more out of the lecture this way. (And don't forget to answer the weekly Reading Quiz in MasteringPhysics)

Scientific Writing Assignment

During this course you will research and write an article at the "Popular Science" level. The purpose of this is to get you thinking about science in the bigger picture. An education in Physics lets you see the world differently, peeling away the surface and revealing some underlying threads that run through many different and apparently unconnected situations and phenomena. On the other hand, the laws of physics were not arrived at easily and the motivations that drove the men and women responsible are often overlooked.

Your assignment is to combine a physicist's perspective with your own unique outlook, as you describe a compelling and important scientific topic.

You need to be thinking about this project throughout the semester. On the dates given in the course schedule you must: 1. Choose the title, and submit a list of ideas. You will receive comments (and credit) within two weeks. 2. Submit the first draft. It will be checked and returned to you after two weeks, with comments (and credit). Obviously do not give us your "only copy", as you will want to keep working on it. 3. Submit your final article (1200 words), in hardcopy and online at Turnitin.com. I can't wait to read your take on Physics in the real world!

