

PHYSICS 111-01 - GENERAL PHYSICS I (MECHANICS, FLUIDS, SOUND, HEAT)

This is the first semester of a general physics sequence aimed primarily at life-science majors.

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Course web page: www.physics.sfsu.edu/~lockhart/courses/phys111.html

Office hours to be announced in class + other times by appointment. You are encouraged to make use of my office hours. Small gaps in understanding can be easily corrected if taken care of promptly, but can lead to much greater difficulties later if ignored.

Text: James Walker, *Physics, Custom Edition for San Francisco State Univ.*, (Pearson Custom, 2009) is **required**. We will cover the material in Volume 1, but you may want to get the combined volume 1+2 book if you will be taking Physics 121. The bookstore has a “bundle” with the textbook, lab manual, and a WebAssign access code for the on-line homework.

You can also use James Walker, *Physics, 4th edition*, (Pearson/Prentice-Hall, 2009) or even James Walker, *Physics, 3rd edition*, (Pearson/Prentice-Hall, 2007).

Recommended supplements: You might find the *Study Guide, Vol. 1, 3rd, or 4th ed.* by Walker and Read to be helpful; it is available at the bookstore. Students sometimes prefer *Schaum's Outline of College Physics, 10th ed.* (2005), which has a lot of solved problems.

Prerequisites: Knowledge of algebra and basic trigonometry. This will be tested by a “**physics readiness**” test given at the second class meeting (see separate handout page for details). You must pass this test in order to be or stay enrolled in Physics 111. You must take and pass the test again even if you took it in a previous semester. You must also have a score of 50 or better on the Entry Level Mathematics Exam (ELM).

Assignments: There will be frequent required homework assignments, probably three per week. The homework is to be submitted via the web using **WebAssign** (see below). Homework is not a test. You are encouraged to work together on it and get help. However, you are responsible for understanding the physics of each homework problem and the method of solution. You must calculate your own answers. It is cheating to let other people do your homework for you. **You must start doing the WebAssign homework right away.**

Exams and Grades: There will be two midterm exams, a comprehensive final exam, and 4-5 short quizzes. Equation sheets will be provided for exams. The tentative exam dates are listed on the course schedule, but the midterm dates may change (the final exam date and time is firm). If you have to miss a midterm exam, contact me as soon as possible (preferably before the exam). A grade of zero will be assigned unless you have a good excuse for missing the exam. If you do have an acceptable excuse (including a doctor's note in case of illness), your grade for the missed test will be the score you get on the final exam. Make sure to be available to take the final exam at the indicated date and time. Grades will be assigned according to the following approximate percentages: homework, 20%; midterms & quizzes, 40%; final, 40%

Laboratory: The accompanying laboratory course, Physics 112, is to be taken concurrently with the lecture course. You will need to purchase a laboratory manual (sold at the bookstore and available bundled with the textbook) and a lab notebook; details given on the lab schedule. Labs meet in TH 118. Be sure to attend the first lab meeting to hold your place in lab.

Lecture Attendance: Attendance at the lectures is not mandatory, but is advisable. Physics is best learned when you are exposed to the material in several ways – by reading the book, attending lecture, doing the homework, and doing the labs. Material and demonstrations that

are not in the book may be presented in lecture, and homework problems may be discussed.
Please turn off cell phones during the lecture.

Help Sessions: Optional “help” sessions (for help with homework and questions) will be held weekly at several different times to be announced.

Efficient Method of Study: **Before** the lecture, read at least the indicated text sections and study the examples. Read the sections again after the lecture. At the very least, attempt all the assigned problems and if at all possible, work through some additional problems. Try to work the homework problems from fundamental relationships rather than by using special case formulae. Compare your solutions to the posted ones. **Ask questions** in the lecture, after the lecture, in help sessions, and in office hours. Finally, **keep up** with the material as it is covered. Each new section will build on the previous material, and you will lose much of the benefit of the lectures and assignments if you fall behind.

Learning Objectives: To develop an understanding of the nature of motion, forces, energy, momentum, rotational motion and torque, vibrational motion, fluids and fluid motion, temperature and heat, thermal effects in gases, wave motion and wave phenomena, and sound, and to develop the ability to apply this knowledge to the solution of problems involving those phenomena. The course will also provide preparation for the physics portion of the MCAT exam.

Cheating/Plagiarism: All work you submit must be your own. You are encouraged to work together and get help on homework, but the final answers you submit must represent your own work. See the Physics and Astronomy Plagiarism policy on <http://www.physics.sfsu.edu> under Department Policies

Withdrawals: You can drop yourself from the course any time up through the “drop deadline.” After that, you must withdraw by petition, for “serious and compelling reasons.” If you withdraw from the lecture, you normally must also withdraw from the lab. A new SFSU policy only allows you once chance to repeat a course. Thus, if you withdraw from this course, you will basically not be able to withdraw a second time. The deadline for withdrawing without a documented serious medical reason is Nov. 19. See the Dept. withdrawal policy on <http://www.physics.sfsu.edu> under Department Policies.

Disability Accommodation: Students with disabilities who need reasonable accommodations are encouraged to contact the instructor. The Disability Programs and Resource Center is available to facilitate the reasonable accommodations process. The DPRC, located in SSB 110, can be reached by telephone at 338-2472 (voice/TTY) or by e-mail at dprc@sfsu.edu.

WebAssign Details

Registration:

You must purchase an access code for the WebAssign on-line homework service. A code comes bundled with some textbook packages, and you can also purchase a code at the bookstore, or on-line with a credit card. WebAssign can be accessed at <http://webassign.net> . **You can log in to WebAssign and use the homework system without paying for an access code for the first two weeks of the semester**, so you may want to wait until you have passed the math test before purchasing an access code. We hope that you will like the instant feedback from the on-line grading system.

Logging On to the System. To do the homework, connect with a computer browser to <http://webassign.net> You log on with a username and password which we construct for you. Figure out yours using the following example:

If your name and SFSU ID are: Minerva **Smith-Gomez**, 54321**0987**, then your log-in is:

Username: **smithgomez0987**

Institution: **sfsu**

Initial password: **0987** or **987**

Username:

This is formed from the last name you have on file at the registrar, plus the last four digits of your SFSU ID (*not* your social security number). If you have a space or a dash in your last name, it is omitted.

Password:

Your password is formed from the same four digits used in your username - the last four digits of your SFU ID. But - leading zeros may be dropped. You may have to try it both ways. *You should change your password immediately during your first log-in*, to something more secure and unique. This can be done under "My Options" on the upper right.

Important note for previous WebAssign users: If you have had a WebAssign account at SFSU in the past, you will already have a username and password in the WebAssign system. You should continue to use the user name and password. If you have forgotten your password, let me know and I will reset it for you.

Try your log-in ASAP. Accounts will be set up for people on class lists or wait lists from the start of the semester. Try it out right away. If you are sure it is not working, email your instructor for help. Include your name, SFSU ID, *and the log-in you are trying to use*.

Email address. While you are in "My Options," note the email address in the system. This will probably be your SFSU email. Feel free to change the email address to another one you prefer. Having your email in the system is important because (1) if you ever forget your password, WebAssign can email it back to you automatically, and (2) we will have your preferred email on file. Independent of the WebAssign system, it is good if you receive email from your SFSU email account. We are likely to send you email via the SFSU registration system, since most other methods don't work for hundreds of people at a time! The best way is for you to set up forwarding with your SFSU account, to send the mail on to your yahoo, gmail, hotmail, *etc.* account. Instructions for forwarding email are given at <http://www.sfsu.edu/~helpdesk/email/emailcentral.html#forwarding>.

General System Usage. You can log in and out of the system as many times as you like, and can save your work from one session to another. You can make several tries on each part of each question. You should avoid the "Submit entire assignment" button at the very bottom of the assignment, since each such submission uses up one of your tries on each part of each problem. Just submit your answers individually, one by one. Note that the numerical values in many problems are "randomized" for each student.

“Introduction to WebAssign” Assignment. Please work through the initial assignment showing how to enter numbers into the system. Exponents and equations are a bit tricky. In general, WebAssign looks for one percent accuracy (three significant figures). So, work out the problem with four significant figures and then round off the answer to three significant figures. Enter scientific notation using an "e". For example, 4.61×10^{-3} would be entered as 4.61e-3. This assignment will not be graded.

Using the WebAssign “Ask Your Teacher” Function.

If you have trouble working the homework problems, you can use WebAssign's "Ask Your Teacher" function. This is better than sending me an e-mail because I will be able to see what answers you have tried. To use this feature, navigate to the top or bottom of the assignment you are working on and click on "Ask Your Teacher." Say what problem you are having trouble with, and what you have tried, then click "Save". To view my response, open up the assignment and click again on "Ask Your Teacher."

PHYSICS 111-01 TENTATIVE LECTURE SCHEDULE - FALL 2009 J.M. LOCKHART

<u>Week</u>	<u>Lect.#</u>	<u>Date</u>	<u>Topics</u>	<u>Reading</u>
1	W 1	8/26	Introduction; Units & Dimensions; Sci. Notation	Chap. 1
	F	8/28	Math Exam	
2	M 2	8/31	1-D Position; Coordinate Systems; Displacement; Avg. Speed	2.1-2.3
	W 3	9/2	Velocity; Forces & Newton 1st Law; Acceleration;	2.4-2.6
	F	9/4	Campus Closure - No Class	
3	M	9/7	Labor Day - No Class	
	W 4	9/9	Gravity & Free Fall; 2&3-D Position & Displacement; Vectors	2.7;3.1-3.3
	F 5	9/11	Vector Math; 2-D Velocity, Acceleration	3.3-3.6
4	M 6	9/14	2-D Motion; Projectile Motion	4.1-4.3
	W 7	9/16	2-D Motion Examples; Force	4.4-4.5
	F 8	9/18	Force, Mass, Newton's 1st & 2nd Laws	5.1-5.3
5	M 9	2/21	Newton 3rd Law; Force Vectors	5.4-5.5
	W 10	9/23	Gravity; Weight; Contact Force (Normal);	12.1 & 5.6-7
	F 11	9/25	Frictional Forces;	6.1
6	M 12	9/28	Strings & Springs; Equilibrium Force Probs; Non-Eqm Force Probs	6.2-3
	W 13	9/30	Connected Objects; Circular Motion; Centripetal Accel. & Force	6.4-5
	F 14	10/2	Work & Energy	7.1
7	M	10/5	MIDTERM I (Chaps. 1-6)	
	W 15	10/7	Work-Energy Theorem; Power	7.2-4
	F 16	10/9	Potential Energy; Conservative & Non-Cons. Forces	8.1-2
8	M 17	10/12	Cons. of Mech. Energy	8.3-4
	W 18	10/14	Momentum & Impulse;	9.1-3
	F 19	10/16	Cons. of Momentum ;Collisions; Center of Mass	9.4-6
9	M 20	10/19	Angular Motion; Accelerations in Rotation;	10.1-3
	W 21	10/21	Rolling; Moment of Inertia; Angular K.E.	10.4-6
	F	10/23	Campus Closure - No Class	
10	M	10/26	Campus Closure - No Class	
	W 22	10/28	Torque; Static Equilibrium; Rotational Dynamics;	11.1-3
	F 23	10/30	Rotational Dynamics; Angular Momentum;	11.5-7
11	M 24	11/2	SHM; Energy in SHM; Pendulum; Driven SHM; Resonance	13.1-6
	W 25	11/4	Fluids - Density & Pressure	15.1-3
	F 26	11/6	Floating; Archimedes' Principle; Fluid Motion	15.4-5
12	M 27	11/9	Bernoulli Eqn; Viscous Flow	15.6-9
	W	11/11	Veteran's Day; No class	
	F 28	11/13	Waves; Reflection	14.1-3
13	M	11/16	MIDTERM II (Chap. 7-11;13,15)	
	W 29	11/18	Sound	14.4-5
	F 30	11/20	Human Ear; Sound Perception; Doppler Effect	14.5-6
			Thanksgiving Break	
14	M 31	11/30	Wave Interference; Diff, Standing Waves; Complex Sound Waves	14.7-8
	W 32	12/2	Temperature & Thermometers; Thermal Expansion; Heat	16.1-4
	F 33	12/4	Heat Capacity; Heat Flow	16.5-6
15	M 34	12/7	Ideal Gas Law; Kinetic Theory	17.1-2
	W 35	12/9	Phase Change; Latent Heat	17.4-6
	F 36	12/11	First Law of Thermo.	18.1-2, 18.8
16	M 37	12/14	2nd Law; Entropy; Engines, Refrigerators	18.5-7
	W	12/16	FINAL EXAM (10:45 a.m. - 1:15 p.m.)	