Physics 106-001 General Physics with Calculus II **Fall, 2003**

Class meetings: TR 9:30- 11:20, F 10:00 – 10:50, 313 Gallalee

Credit: 4 hours

Instructors:

Dr. Stan Jones
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Office Hours: TR 2:00 – 3:00
or whenever my door is open.

Text: Serway and Beichner, Physics, 5th Ed. (vol. 2)

Prerequisites: PH 105, MATH 126

General Course Description: This is an introductory calculus-based course in thermal physics, electricity and magnetism, and optics.

Course Topics: Temperature, heat, kinetic theory, and the laws of thermodynamics; reflections and refraction, lenses and mirrors; electric fields, electric potential, capacitors, dc circuits, magnetic fields, Ampere's law, Faraday's law, inductance, and electromagnetic waves.

Course Goals and Objectives: Upon completion of this course, the student should have a basic understanding, both qualitative and quantitative, of geometrical and physical optics, circuits, electricity and magnetism, and waves. Students should be able to solve problems in these subjects using math through calculus, and should also be able to use the computer to analyze physical situations.

Instructional Philosophy: The course will emphasize fundamental concepts and problem-solving techniques in physics using interactive instruction, computer-based techniques, and cooperative learning. There will be no separate lab and lecture sections as is the case in the traditional physics course. The course will be team-taught by a faculty member (Jones), and an undergraduate assistant (-----). During classes on Tuesday and Thursday (two hours each) there will be a mix of short lectures and group activities. The group activities will include short lab experiments and other short 'exercises'. The exercises will consist of real-world problems and computer simulations. The one-hour Friday class will be a 'recitation' devoted to problem solving.

Help Center: Physics GTAs will hold their office hours in this room, at times to be announced. You may come for help or to complete an assignment.

Homework: *Problems from the textbook are assigned weekly and are normally due before 1:00 Tuesday* (unless stated otherwise). The problem solutions must be submitted on the web using a web-based program called Brooks-Cole Assessment (BCA). BCA can be accessed using either Netscape or Internet Explorer and requires a student password. BCA gives immediate feedback on the correctness of each problem, and students can resubmit problems if they are incorrect, up to a maximum of five attempts. The numbers in the problem are different for each student. The first Friday recitation session will be devoted to explaining how to use BCA.

It is important to understand how to work a problem and not just to submit a correct answer. Students must keep a notebook of how they work each problem and be prepared to turn this in for spot grading as requested. Although students may collaborate when working problems, each student should keep a record of problem solutions (not just answers) and should submit their own answers – based on the particular numbers in their problems.

It is essential that you read the textbook, as the lectures will not cover all the material. As an incentive for reading the text, *you will be required to answer one question about the reading before each class period.* These questions will also be on BCA, and will be due by the start of class. All problems (in fact, every answer) on BCA will count the same. There is an excellent website associated with the textbook that can be used by students for assistance with working problems (http://www.saunderscollege.com/physics/pse ...click on student resources at right of webpage) including practice problems and detailed solutions to selected problems.

GRADING: Problems will be submitted each week outside of class. In-class work will be collected at the end of each class period and will count as part of the course grade. Not all in-class work will be graded in detail. Occasionally, short (10 min) quizzes will be given on Friday based on in-class work done during the week and the most recently submitted problem assignment. Problem notebooks will also be occasionally collected on Friday for spot-checking. Thus, class attendance is very important. There will be no make up of missed class work. The lowest activity grade and the lowest recitation grade will be dropped when computing the final course grade. There will be three one-hour exams and a comprehensive final exam.

In-class activities*	20%
Problems (BCA)	10%
Recitation*	5%
Hour Exam I	15%
Hour Exam II	15%
Hour Exam III	15%
Final Exam	20%

* Lowest grade will be dropped

Attendance Policy: You are responsible for all material, schedule changes, etc. that are announced in class. *There will be frequent in-class work that will be collected and counted as part of your homework grade.* In short, you are expected to attend class.

Makeup Policy: To avoid receiving a zero for a missed hour exam, you must contact me (by phone if necessary) within one class period of the missed exam. Ordinarily, an excused hour exam will be "made up" by having the remaining exams count proportionally higher.

Academic Misconduct Policy: Students are expected to do their own work on exams. Suspected violators of this policy will be referred to the Arts and Sciences Dean's Office.

Students are *encouraged* to work together on *homework and general studying* for this course. However, each student must submit his or her own homework solutions.

Disability Accommodations: To request disability accommodations, please contact Disabilities Services (348-4285). After initial arrangements are made with that office, contact Dr. Jones.

Grade Scale: {96.7 - 100} = A+ {93.3 - 96.7} = A {90.0 - 93.3} = A-
{B} is {80 - 90}; {C} is {70 - 80}; {D} is {60 - 70}; F is < 60. Some scaling make take place both on exams and on the final grade determination.

Tentative Schedule

Week	Date	Topics	Activities
1	Aug. 21	Temperature (Ch. 19)	
2	26	Heat (Ch. 20)	Boyle's Law lab
	28	Heat	{Worksheet}
3	Sept. 2	Kinetic Theory (Ch. 21)	Calorimetry lab
	4	2nd Law and Engines (Ch. 22)	
4	9	2nd law	Heat engine worksheet
	11	Review	Exam 1 (Ch. 19-22) Friday
5	16	Electric Fields (Ch. 23)	Learn MAPLE
	18	"	E field of rod (MAPLE)
6	23	Gauss' Laws (Ch. 24)	Electrostatics IP
	25	"	{Worksheet: problems}
7	30	Electric Potential (Ch. 25)	E fields/equipot. Lab Gradients MAPLE
	Oct. 2	Capacitors (Ch. 26)	Capacitors worksheet
8	7	Current & Resistance (Ch. 27)	Circuit lab (light bulbs)
	9	Review	Exam 2 (Ch. 22-26) Friday
9	14	DC Circuits (Ch. 28)	Circuit lab (resistors, meters)
	16	DC Circuits	{Worksheet: problems} RC circuits lab
10	21	Magnetic Fields (Ch. 29)	Magnetic force IP
	23	Sources of Magnetic Fields (Ch. 30)	Earth's mag. field lab
11	28	"	Bio-Savart worksheet
	30	Faraday's Law (Ch. 31)	Induced emf lab
12	Nov. 4	Review	Exam 3 (Ch 27-30) Friday
	6	Ch. 31	Lenz's Law worksheet
13	11	Inductance (Ch. 32)	{worksheet}
	13	"	
14	18	Electromagnetic Waves (Ch. 34)	{worksheet}
	20	Reflection and Refraction (Ch. 35)	Reflection, refraction lab
15	25	Geometric Optics (Ch. 36)	Rainbows MAPLE
16	Dec. 2	"	Lenses and mirrors lab
	Dec. 4	Review	Lenses and mirrors WS
17	Thurs., Dec. 11, 8:00 - 10:30 am	Final Examination (Comprehensive)	