University of California, Santa Barbara

Department of Physics

Physics 6B - Winter 1997

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Lecture: Tuesday and Thursday, 9:30-10:45AM; 2:00-3:15PM Broida 1610

Office Hours: Wednesday 9:00AM-noon, also by Appointment, Broida 5123

Required Textbook: V.C. Coletta, College Physics

Content: In Physics 6B, we cover fluids, heat and related topics, waves, electrostatics, and current. These topics are in Chapters 11-20 of the text. A detailed syllabus appears on the back of this page.

Grading, etc.: Quizzes in section, 20%; each of 2 midterms, 20%; Final, 40%. Overall grades will depend on a weighted total of the scores on the tests. Grades are not assigned based on a 'curve': you are not competing against one another. Midterm dates are **Thu., Jan. 30** and **Tues., Feb. 25**. The final will be **Sat., Mar. 15** from **7:30-10:30PM**.
Quizzes and midterms missed without a prior written approval from Prof. Nelson will probably result in zero credit for those tests; Prof. Nelson will require written explanations from Doctors, etc., and a phone number for immediate contact of such parties. Not taking the final will result in a failing grade.
Always bring a photo ID and two pens (no pencils) to the midterms and the final. Do not bring a bluebook, a calculator, or scratch paper. Communication between students during a test is cheating.

Problems: Ten problems will be assigned each week (at latest) by the Tuesday lecture. Solutions will be posted on the subsequent Friday in the Physics 6 glass case on the 2nd floor of Broida Hall and in the RBR of the library. Most (but not all!) quiz, midterm, and final problems will be very similar to (and sometimes, selected from) the assigned problems.

Discussion Sections: Discussion sections are attached to the associated lab course, 6BL. **Even if you are not enrolled in 6BL, you must choose a 6BL discussion section and attend it, in order to take the quizzes.**

Help: Attend your discussion section. The **Physics Study and Lecture Room** at 3302 Broida Hall, also called the **PLC**, has Physics teaching assistants available daily from 8:00 AM to 4:30 PM. You can attend free Instructional Groups if you make advance arrangements with the Campus Learning Assistant Service (CLAS) in Bldg. 477, phone 893-4248, 893-3269.

Perspective: Physics 6B is a challenging course, but with calm, diligent effort, you can master the material. The topics are of great importance for the understanding of many disciplines in science, medicine, and technology.
Problem-solving skills are much more important than memorization when learning physics.
To achieve the greatest understanding with least effort, do the reading listed on the syllabus *before* the lecture. Read in a quiet place where you can concentrate, and have scratch paper, a pencil, and a calculator available. Work the examples, and try the problems *as you read*. After the lecture, review the reading, and finish the problems: get the solutions *after* doing your final work on the problems, and use them to *correct* your work. Reading the solutions prior to completion of your own work will seriously reduce your retention and comprehension of the material.
When you work problems, it is essential to make clear drawings whenever possible, and to write down the fundamental principles and equations that you will base your solution upon. Establish a clear strategy for solving the problem, and write a brief description of that strategy. After you think you have solved the problem, re-read the wording of the problem, and double-check that you have provided everything.

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Syllabus - Physics 6B - Winter 1997

Week	#	Date	Pre-Lecture Reading		Topics (Partial List)
1	1	1/7	11-1 → 11-3	pp. 257-269	Fluid Properties, Pressure, Archimedes' Principle
	2	1/9	11-4 → 11-6	pp. 270-282	Surface Tension, Bernoulli, Viscosity
2	3	1/14	11-7	pp. 282-286	Poiseuille's Law
			12-1 → 12-3	pp. 295-306	T, Ideal Gas, Kinetic Theory
	4	1/16	12-4 → 12-6	pp. 306-315	Ideal Gas Deriv., Vapor Pressure & Humidity, Thermal Expansion
			13-1 → 13-3	pp. 320-328	Heat, Calorimetry, Radiation
3	5	1/21	13-4 → 13-5	pp. 329-333	Convection, Conduction
			14-1 → 14-2	pp. 338-345	Thermodynamic Systems, First Law
	6	1/23	14-3 → 14-5	pp. 346-358	Heat Engines, Refrigerators, Second Law, Metabolism
			15-1	pp. 366-368	Simple Harmonic Motion (SHM)
4	7	1/28	15-2 → 15-4	pp. 369-377	SHM and Circular Motion, Mass and Spring, Pendulum
	8	**1/30**	**First MIDTERM**		**Chapters 11-14**
5	9	2/4	15-5	pp. 378-381	Damped & Forced Oscillations
			16-1 → 16-3	pp. 386-399	Waves, Wave Speed, Doppler Effect
	10	2/6	16-4 → 16-6	pp. 399-420	Power, Intensity, Decibel, Medium Particle Motion, Superposition, Beats
6	11	2/11	17-1 → 17-2	pp. 427-433	Electric Charge, Coulomb's Law
	12	2/13	17-3 → 17-4	pp. 434-444	Electric Field, Field from Charge Distribution
7	13	2/18	17-5	pp. 444-447	Field Lines
			18-1	pp. 457-468	Electric Potential Energy and Potential
	14	2/20	18-1	pp. 457-468	Electric Potential Energy and Potential
8	**15**	**2/25**	**Second MIDTERM**		**Chapters 15-17**
	16	2/27	18-2 → 18-4	pp. 468-483	Capacitance, Dielectrics, Oscilloscope
			19-1	pp. 493-495	Electric Current
9	17	3/4	19-2 → 19-3	pp. 495-509	Ohm's Law, Power, Batteries, AC
	18	3/6	19-4	pp. 509-512	Microscopic View
			20-1 → 20-2	pp. 518-522	Circuit Description, Kirchoff's Rules
10	19	3/11	20-3 → 20-7	pp. 523-538	Equivalent Resistance, Multiloop Circuits, Measurements, RC Circuits, Shock and Household Electricity
	20	3/13			Review / Contingency
11	**21**	**3/15**	**FINAL 7:30-10:30pm Campbell Hall**		**Chapters 11-20**