

COLLEGE PHYSICS I - PH 201-5B (4 hrs)**Summer 2005**

Lecture: Monday, Wednesday, Friday 9:40-11:40 am, Campbell Hall (CH) Room 301
Instructor: Prof. Thomas Nordlund tel. 934-0340, office CH 345, e-mail nordlund@uab.edu
Course web site: www.phy.uab.edu/~nordlund Click on appropriate course.
Office Hours: Mon 1:00-3:00 pm, Wed. 11:40-12:40 in CH 345 and by appointment.
Course Description: First term of non-calculus based physics. Linear and planar motion, Newton's Laws, work and energy, gravitation, momentum, rigid body motion, statics, elasticity, oscillations, fluids, ideal gases, heat, and thermodynamics.
Course Prerequisite: Physics 100 or Physics Placement Test passing score. Call 934-3704 for an appointment if necessary. Co-requisite: PH 201L (College Physics I Lab, 0 hrs)
Course Text: Cutnell & Johnson, *Physics*, 6th Edition (2004, hb. full version or pb. Vol. I)
Lab Text: Lab handouts will be provided.

Tests and Exams: Two midterm tests and one comprehensive final exam (2.5 hours) will be given. Textbook and notebooks are not allowed in the exams. One letter-size formula information sheet is allowed. A calculator *without physics, engineering, or information-storage modules* may be used. There will be no make-up tests & exams except for the most extraordinary circumstances (*documented* illness, etc.). The tests & exams will be based on problems related to homework and problems discussed in class. In addition, some qualitative questions based on assigned text reading may appear. The intent of the test & exam problems will be to test your understanding of physics principles and your ability to apply these principles to practice. To do well on the tests & exams, you should do the reading assignments before class, pay attention to lectures, and personally work all of the homework problems when they are assigned. The tests & exams will be graded on a step-by-step basis, with partial credit awarded for correct steps and techniques even if the numerical answer is wrong. Full credit will be awarded if the right answer is obtained for the right reasons. Show all work on exams!

Homework:

Homework is electronically administered via an internet website: <http://homework.phy.uab.edu/>
Homework due dates/times are enforced by the computer system. You may attempt any problem up to 8 times, unless otherwise indicated.

It is advisable to start homework as soon as a problem set is given. It is critical to work these problems yourselves when they are assigned, since this will help to lock in understanding of the physical principles learned from class and the textbook and develop problem-solving skills, which will be necessary for any type of success on the exams. Do not fall into the trap of just reading over or memorizing homework solutions, this will generally be of little or no use for solving exam problems or for lasting understanding.

To solve homework problems, you need internet access and a web browser (Netscape or Internet Explorer). All students have access to library computers. You may also use computers in CH394 ("Del Square"). A card key is required to enter Del Square. If you have already a UAB card key (e.g., a card key to a UAB dormitory), you can use it. However, you need to activate it for Del Square. If you do not have a UAB card key, you need to buy one at UAB key control office. If you need more information, ask Patricia Parsley (CH 310, tel: 975-8094, E-mail: pparsley@uab.edu)

Lab. Procedures and policies will be explained by your lab TA and overseen by Prof. Martin (CH 344). Lab grades will be relayed to your PH 201 course instructor, who will incorporate them into the course grade.

Attendance. Active^{*} listening and participation during the lecture is an important part of learning Physics, especially in an accelerated class schedule. Many students, esp. those who have not studied Physics before, do not learn much from just reading the text. While attendance does not necessarily indicate active listening during lecture, active listening cannot be accomplished without attendance. Therefore, 2% of the grade will depend on attendance: attendance score = $2\% \times (4 - \# \text{absences})/4$ [†], not to go below 0. A sign-in sheet will be available at the beginning of each class starting the 2nd day of class.

Pace of course: This summer version of PH 201 compresses the material of the 15-week semester into somewhat less than 10 weeks. The pace is quite rapid and not all text sections will be covered in lecture (esp. on midterm days). It is critical not to get behind!

Related UAB core learning outcomes: Students successfully completing this course will demonstrate knowledge of fundamental concepts in mechanics and the ability to apply this knowledge and mathematical skills in algebra, trigonometry and vectors for quantitative reasoning and problem solving.

Course learning objectives:

- Demonstrate knowledge and understanding of linear and rotational kinematics and dynamics, statics, work and energy, momentum, oscillation and thermodynamics.
- Demonstrate ability to interpret data and apply fundamental physical concepts as well as quantitative reasoning and mathematical analysis skills to effectively solve problems. You should be able to: 1) read a description of the problem and translate nonscientific prose into the language of physics, identifying key physical variables that point to a solution; 2) set up a figure or diagram to assist in analyzing the problem; 3) determine a relationship between the given physical quantities and the ones to be found; 4) carry out mathematical operations to arrive at a solution.
- Demonstrate (in the associated laboratory) the ability to collect, evaluate and communicate scientific information

Measurement of learning objectives: Homework problem sets and exams will be used to measure understanding of the fundamental concepts presented as well as students' abilities to apply this understanding to problems. Immediate grading of the problem sets by the homework system will provide feedback to students on their strengths and weaknesses. Problem sets and exams also provide an opportunity to evaluate the progression of students' reasoning and mathematical skills.

Grading:	Homework:	20%
	Lab	15%
	2 Midterm Tests	15+15=30%
	Final Exam (2.5 hr)	33%
	Attendance	<u>2%</u>
	TOTAL:	100%

- A:** 90% or above
- B:** 80%-89.9%
- C:** 70%-79.9%
- D:** 60%-69.9%
- F:** 59.9% and below

* "Active" listening implies alertness (of course), but also a constantly questioning mind—"Why is the professor saying that? Why did he use that diagram? Why not use the law of cosines instead of vector components?..."

[†] If absences are for legitimate, documented reasons, the absence can be made up through an office-hour visit.

Tentative Schedule*:

Week	Date	Text Reading**	Topics
1	June 1,3	Ch 1, Ap. A-E; 2.1-2.3	Introduction and Mathematical Concepts; measures of motion.
2	June 6,8,10	Ch 2.4-2.8; 3.1-3.2	Kinematics in 1 & 2 dimension
3	June 13,15,17	Ch 3.3, 3.5; 4.1-4.4	Kinematics in 2 dimensions
4	June 20,22,24	Ch 4.5-4.13	Forces, Newton's Laws;
5	June 27,29, Jul 1	Ch's 5 (exc. 5.7); 6.1-6.2	Circular Motion, Work June 27 midterm (Ch's 1-4)
6	July (4),6,8	Ch's 6.3-6.10; 7.1-7.3	Energy, Momentum
	July 12		Last day to withdraw with a "W"
7	July 11,13,15	Ch's 8 (exc. 8.7); 9	Rotational kinematics & dynamics
8	July 18,20,22	Ch's 10.1-10.6; 12.1-12.5	Simple harmonic motion; temperature and heat.
9	July 25,27,29	Ch's 12.6-12.8; 13	Heat, heat transfer July 25 midterm (Ch's 5-12.5)
10	Aug 1,3	Ch's 14.2-14.3, 15 (exc. 15.8-15.10,)	Kinetic theory, thermodynamics
	Aug 5	Review session	10:00-11:30 am, CH 301 (tentative)
	Aug 8	Final Exam	8:00-10:30 AM Comprehensive
		Ch 11	Optional (non-graded) exercises from Ch 11 will be provided near the semester's end.

* Check course web site www.phy.uab.edu/~nordlund for updates, news, and notes.

** You are responsible for the entire assigned reading, even though some topics will not be covered in lecture.