INTRODUCTION TO MODERN PHYSICS

PHYS 3305 (FALL 2011) SYLLABUS http://www.physics.smu.edu/~kehoe/3305/F11.html

Instructor:	Professor Bob Kehoe	Office:	Fondren Science 113
e-mail:	<u>kehoe@physics.smu.edu</u>	Phone:	(214) 768-1793
		Fax:	(214) 768-4095

Texts: "Modern Physics", 2nd edition, Randy Harris

"World Treasury of Physics, Astronomy and Mathematics", ed. Timothy Ferris **Prerequisite:** differential and integral calculus, scientific calculator **Class Coordinates:** Tues. & Thurs. 12:30p.m – 1:50p.m. in Rm 155 Fondren Science **Office hours:** 10am-12noon Tuesday, or by appointment

Course Objectives: To provide an overview of the physics of the 20th century. Students will familiarize themselves with special relativity and quantum mechanics. They will also study the physics of nuclei, atoms and semiconductors. Modern applications will be discussed. Problem solving skill development will also be an emphasis of the class.

Method of Instruction: The class will consist of lectures. Homework is the foundation of your effort to acquire skill in using the material in the course. It will be due on each Tuesday following the week the material is covered and will be worth 20% of the course grade. No late homework is accepted. Solutions will be posted on the course website.

Quizzes and Tests: There will be one mid-term exam, and one final exam. The mid-term will make up 20% of the class grade. The final is cumulative over the whole course and counts for 25% of the grade. There will be weekly 15 minute quizzes during the semester, scheduled on Tuesdays of each week. These will provide 20% of your grade. The lowest quiz grade will be dropped. Each quiz covers material since the last test or quiz. Tests and quizzes are closed book. You may bring a single 8.5"x11" sheet with important formulas and constants relevant for the material on each test and quiz. A presentation on a special topic at the end of the semester will count for 15% of the course grade.

Grading and Attendance Policy: In all cases, it is **crucial** to show your work to get credit for solutions to physics problems. Regrading requests must be well-justified in writing. Anticipated absences resulting from religious observance or officially sanctioned extracurricular activity must be brought to the instructor's attention at least 2 weeks in advance. Upon request, missed lectures will be recorded as an audio podcast with a copy of lecture notes. Affected quizzes or tests will be given prior to the rest of the class. No other make-up quizzes or tests will be granted.

PHYSICS 3305 SCHEDULE, FALL 2011

Date	Reading, Homework	Tests, Quizzes, Presentations:_
Aug 23 T Aug 25 Th	Ch 1: Precursors to Modern Physics Ch 2: Special Relativity Ch 2 HW: 18,20,21,31; 45,51,54,62,70,84,94	
Aug 30 T		Quiz #1
Sep 6 T Sep 8 Th		Quiz #2
	Ch 3: EM Waves as Particles Ch 3 HW: 12,18,19,20,21,26,34,45,49,53	
Sep 13 T Sep 15 Th	HW Ch 2 due Ch 4: Matter Particles as Waves Ch 4 HW: 17,18,19,22,24,41,43,48,62,63	Quiz #3
Sep 20 T	HW Ch 3 due	Quiz #4
Sep 27 T	Ch 5: Schrodinger Equation; HW Ch 4 due Ch 5 HW: 24,25,28,33,34; 50,60,61,62,78-82	Quiz #5
Oct 6 Th	""	Test #1 (Ch. 1-4)
Oct 11 T Oct 13 Th	*Fall Break, no class Ch 5: (cont.)	
Oct 18 T	""	Quiz #6
Oct 20 Th	Ch 6: Unbound States Ch 6 HW: 15,16,24,35,45,48,56	
Oct 25 T	HW Ch 5 due	Quiz #7
Nov 1 T Nov 4 F	""	Quiz #8 practice talks;
Nov 8 T	Ch 7: Hydrogen Atom; HW Ch 6 due Ch 7 HW: 21,32,36,37,38,44,58,68,85	
Nov 15 T	""	Quiz #9
Nov 22 T	Ch 8: Spin; HW Ch 7 due Ch 8 HW: 28,30,31,35,41,49,50,56,62,80	Quiz #10
Nov 24 Th	*Thanksgiving holiday, no class	
Nov 29 T	Ch 10.5-10.8: Semiconductors; HW Ch 8 due Ch 10 HW: 50,57,64,66	Quiz #11
Dec 2 F	HW Ch 10 due	final presentations
Dec 12 M		Final Exam 8am-11am