

# INTRODUCTION TO MODERN PHYSICS

**PHYS 3305 (SPRING 2015) SYLLABUS**

<http://www.physics.smu.edu/~kehoe/3305/S15.html>

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**Texts:** *"Modern Physics"*, 2<sup>nd</sup> edition, Randy Harris

**Prerequisite:** differential and integral calculus, scientific calculator

**Class Coordinates:** Tues. & Thurs. 12:30p.m – 1:50p.m. in Rm 158 Fondren Science

**Office hours:** 10am-12noon Tuesday, or by appointment

**Course Objectives:** To provide an overview of the physics of the 20<sup>th</sup> 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.

**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. 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, SPRING 2015

Date	Reading, Homework	Tests, Quizzes, Presentations:
Jan 20 T	Ch 1: Precursors to Modern Physics	
Jan 21 Th	Ch 2: Special Relativity Ch 2 HW: 18,20,21,31; 45,51,54,62,70,84,94	
Jan 27 T	""	Quiz #1
Feb 3 T	""	Quiz #2
Feb 5 Th	Ch 3: EM Waves as Particles Ch 3 HW: 12,18,19,20,21,26,34,45,49,53	
Feb 10 T	<b>HW Ch 2 due</b>	Quiz #3
Feb 12 Th	Ch 4: Matter Particles as Waves Ch 4 HW: 17,18,19,22,24,41,43,48,62,63	
Feb 17 T	<b>HW Ch 3 due</b>	Quiz #4
Feb 24 T	Ch 5: Schrodinger Equation; <b>HW Ch 4 due</b> Ch 5 HW: 24,25,28,33,34; 50,60,61,62,78-82	Quiz #5
Mar 5 Th	""	Test #1 (Ch. 1-4)
Mar 9 M	*Spring Break, no class	
Mar 17 T	Ch 5: (cont.), St. Patrick's Day: no quiz	
Mar 24 T	Ch 6: Unbound States Ch 6 HW: 15,16,24,35,45,48,56	Quiz #6
Mar 31 T	<b>HW Ch 5 due</b>	Quiz #7
Apr 7 T	""	Quiz #8
Apr 14 T	Ch 7: Hydrogen Atom; <b>HW Ch 6 due</b> Ch 7 HW: 21,32,36,37,38,44,58,68,85	
Apr 21 T	""	Quiz #9
Apr 24 F		practice talks
Apr 28 T	Ch 8: Spin; <b>HW Ch 7 due</b> Ch 8 HW: 28,30,31,35,41,49,50,56,62,80	Quiz #10
Apr 30 Th	Ch 10.5-10.8: Semiconductors; <b>HW Ch 8 due</b> Ch 10 HW: 50,57,64,66	
May 1 F	<b>HW Ch 10 due</b>	final presentations
May 9 Sat.		Final Exam 8am-11am