INTRODUCTION TO QUANTUM MECHANICS

PHYS 5382 (FALL 2014) SYLLABUS http://www.physics.smu.edu/~kehoe/5382/F14.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: "Introduction to Quantum Mechanics", 2nd edition, David Griffiths **Class Coordinates:** Tues. & Thurs. 11:00a.m – 12:20p.m. in Rm 60 Fondren Science

Course Objectives: To provide an introduction to quantum mechanics. Students will familiarize themselves with the Schrodinger equation and the statistical interpretation of wave particles. We will utilize this knowledge to consider particle dynamics, and in the presence of several different potentials. The course will build up the formalism of quantum mechanical calculations. The latter part of the course will be geared toward a discussion of the hydrogen atom, angular momentum and spin. Problem solving skill development will 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 25% of the class grade. The final is cumulative over the whole course and counts for 30% of the grade. There will be weekly 15 minute quizzes during the semester, scheduled on Tuesdays of each week. These will provide 25% 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 quizz.

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.

Learning Objective: Students will be able to apply their knowledge of Quantum Mechanics in solving physics problems.

PHYSICS 5382 SCHEDULE, FALL 2011

Date	Reading, Homework		Tests, Quizzes:_	
Aug 26 T	Precursors to Quantum Mechanics			
Aug 28 Th	Ch 1.1: Schrodinger Equation Ch 1 HW: 1,3,4,6,9,11,13,14,18			
Sep 2 T	Ch 1.2: Probability and Statistical I	nterpretation	Quiz #1	
Sep 9 T Sep 11 Th	Ch 1.6: Uncertainty Principle Ch 2.1: Stationary States Ch 2 HW: 1,2,4,5,6,9,10,12,18,2	ates		
Sep 16 T	Ch 2.2: Infinite Square Well HW Ch 1 due		Quiz #3	
Sep 23 T	Ch 2.3: Harmonic Oscillator		Quiz #4	
Sep 30 T	Ch 2.4: Free Particle		Quiz #5	
Oct 7 T	Ch 2.5 & 2.6: Finite Square Well			
Oct 9 Th	Test #1 (Ch. 1-2) HW Ch 2 due			
Oct 14 T Oct 16 Th	*Fall Break, no class Ch 3.1: Hilbert Space			
	Ch 3 HW: 1,3,4,8,10,16,18,22,27	7,33,37,38		
Oct 21 T	Ch 3.3: Eigenfunction of Hermitian	Operator	Quiz #6	
Oct 28 T	Ch 3.5: Uncertainty Principle		Quiz #7	
Nov 4 T	Ch 4.1: Schrodinger Eq. in Spherical Coordinates HW Ch 3 due Ch 4 HW: 1,2,7,9,10,11,16,21,22,27		Quiz #8	
Nov 11 T	Ch 4.2: Hydrogen Atom		Quiz #9	
Nov 18 T	Ch 4.3: Angular Momentum		Quiz #10	
Nov 25 T Nov 27 Th	Ch 4.4: Spin *Thanksgiving holiday, no class		Quiz #11	
Dec 4 Th	Review; HW Ch 4 due			
Dec 13 Sat.	Final Exam	8 am-11am		