

PHYS 4073- Quantum Mechanics - Fall 2010 Syllabus

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Class Meeting: MWF in PHYS 133 – 12:30pm – I teach UPII Lab at 1:30pm, so I will not be able to take many questions after class. You are welcome to drop in at my UPII lab (SCEN 110 – 1:30-3:30pm MW) for quantum questions.

Office Hours

- SCEN 110 –F 10:30-11:30am (shared with UPII)
- SCEN 110 –MW 9:30-10:30am (shared with UPII)
- PHYS 134 – M 4:45-5:45pm.
- PHYS 220– Th 3:30-4:30pm.

Course Website: <http://physinfo.uark.edu/qm10> - All homework assignments, solutions, and lecture notes will be posted at the course website. Grades will be posted course's blackboard site.

Old Websites: I have left my old quantum mechanics sites up.

- Fall 2003 <http://physinfo.uark.edu/quantum/main.htm>
- Fall 2008 <http://physinfo.uark.edu/qm08>

Course Materials:

Required Textbook – David Griffiths - *Quantum Mechanics – Version 2*

Optional Textbook for Students Planning Graduate School in Physics– *Quantum Mechanics*, Claude Cohen-Tannoudji, Bernard Diu, and Frank Laloe.

Other Materials – You will be allowed to bring a math handbook to the exams (not a math textbook). I suggest *Schaum's Outline Series Mathematical Handbook*. At certain points, a familiarity with either Maple or Mathematica will make you life easier.

Schedule of Topics

The following schedule is extremely preliminary. We will get to things as we get to things.

Week 1 beginning 8/23: Introduction and Preliminaries

Week 2 beginning 8/30: Wave Mechanics

Week 3 beginning 9/6: Infinite Square Well

Week 4 beginning 9/13: Steps and Delta Functions

Week 5 beginning 9/20: Finite Barriers – End Material for Test 1

Week 6 beginning 9/27: Postulates and Mathematics

Week 7 beginning 10/4: Dirac Notation and the Simple Harmonic Oscillator

Week 8 beginning 10/11: Angular Momentum

Week 9 beginning 10/18: Angular Momentum Matrices and Spin – End Material for Test 2

Week 10 beginning 10/25: Continuous Basis Systems

Week 11 beginning 11/1: Three Dimensional Systems and Spherical Harmonics

Week 12 beginning 11/8: Hydrogen

Week 13 beginning 11/15: Addition of Angular Momentum

Week 14 beginning 11/22: Identical Particles + Periodic Table

Week 15 beginning 11/29: Perturbation Theory

Week 16 beginning 12/6: Foundations

Final Exam: Monday December 13th at 8:30am.

Grader: Hardev Singh (hxs008@uark.edu) – Remember, I keep the master copy of the gradebook. So grade corrections must also be reported to me.

Inclement Weather Policy: Unless classes have been officially canceled by the UA, students are expected to attend all class meetings and examinations. If the student lives someplace from which they feel it would be dangerous to travel to the University, they should call and inform their instructor or leave a message for their instructor with the physics department. Students missing a test for this reason will be required to take an alternate test that I will attempt to make of the same difficulty as the missed exam. You are responsible for making the decision to travel in bad weather. I never want a student to put themselves at risk to attend class.

Grading Policy The class is graded on a straight percentage scale >85% A, >70% B, >60% C, >50% D, otherwise F. Grades will be posted online with permission.

Assignments There will be about 10 homework assignments (drop 1) each worth 5 points, three hourly exams (drop ½) each worth 100 points, and a final exam worth 100 points. Hourly exams will be given Thursday nights. Exams are closed book, but you may bring a formula sheet and a math handbook. Exam format will give five questions and ask you to work four. You will not receive more than one letter grade higher than your homework grade with drops.

Reading Assignments The reading assignment for the week will be published with the homework assignment.

Illness Policy: If you are ill, please stay home. If you have an extended illness, please contact me and I will make provisions.

Academic Dishonesty Instances of Academic Dishonesty will be handled in accordance with the guidelines outlined in the University of Arkansas Undergraduate Studies Catalogue. I take cheating very seriously. If you are caught cheating, I will ask that you immediately drop the class.

Final Grades At the end of the course, final grade decisions are mine. I reserve the right to give students near a grade border or with special circumstances a higher grade than they have mathematically earned. In extraordinary circumstances, I reserve the right to give a student a lower grade than they mathematically earned. (This has only happened once, don't be the second.)