

Physics 130b: Quantum Mechanics

Instructor:

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Course Schedule: Lectures MWF at 11-11:50am, [Pepper Canyon Hall](#) Room 121.
Discussion section: Wednesdays 4-4:50pm, [Pepper Canyon Hall](#) Room 121.

About this course: This course is the second of three courses dedicated to an advanced undergraduate lecture series on Quantum Mechanics. Topics include perturbation theory, angular momentum/spin, quantum applications and experiments.

Grading: Homework 30% , Midterm Exam 20%, Class Participation 10%, Final Exam 40%. For both homework and exams (and class participation) I give lots of partial credit. For homework, you may obtain help from any source but you must write up your submission. A crib sheet (size 8.5"x11") in your own handwriting may be used at the mid-term and final examinations, which are, otherwise, closed book. UCSD's Policy on Academic Integrity must be observed. See: <http://senate.ucsd.edu/manual/appendices/app2.htm>

Course Text: David Griffiths, Introduction to Quantum Mechanics, (Pearson Prentice Hall, Upper Saddle River, NJ, 2005), 2nd edition. Most of the homework problems will be assigned from Griffiths.

Homework: Homework will be assigned from the textbook and/or "mini-projects". Homework must be turned in on-time for full credit. You may use any resource you like except for solutions to the homework problems already on the World Wide Web or from any other person.

Class Participation: I expect everyone to attend every lecture, and be on time. Habitual lateness will negatively impact your grade. You are also expected and encouraged to ask questions, participate in discussion, and, of course, correct the myriad errors that I might make during the course. This is yet another form of public speaking that I encourage you to take advantage of.

Midterm Exam: There will be an in-class midterm exam on Friday 2nd November 2012.

Final Exam: Date/time/location: to be announced in class and on the website . You cannot take the final early OR late for any reason.

Outline:

1. Brief Review of Physics 130a (make sure we are all on the same page).
2. Hydrogen Atom
3. Time Independent perturbation theory
4. Spin-1/2
5. Adding angular momenta, Stern-Gerlach
6. WKB Approximation
7. Time-Dependent perturbation theory
8. Applications of quantum perturbation theory (many of these will be from astronomy).
9. The Laser!
10. Famous experiments in QM.