

PHYSICS 519: Quantum Mechanics

Texts:

Shankar, Principles of Quantum Mechanics 2nd Edition, 1994 and Baym, Lectures in Quantum Mechanics Westview Press 1990. There are many other relevant books. New ones by Gottfried & Yan and familiar texts by Sakurai, Schiff and Merzbacher may appeal to you.

Approximate Syllabus:

Addition of angular momentum, rotations and tensor operators, time-dependent perturbation theory, interaction of radiation with matter, identical particles, second quantization for fermions and bosons, geometric phase entangled states, introduction to Dirac equation. The general goal is to provide you with the mathematical tools and physics experience that will enable you to use QM to learn about nature.

Friday Sessions:

These sessions will be run by a TA. The aims are to provide you with extra examples, and give you additional opportunities to ask questions. Whenever possible, relevant problems will be presented so that you will solve them during the session. The intent is to have interactive learning sessions.

Grading:

The homework assignments are to be posted on the course web page. The homework will be due on Friday, and solutions will be handed out immediately after class. Therefore, the homework is to be handed in on time. Late solutions are not accepted. Doing the assigned problems typically requires 12 hours a week, and is probably the most important part of your learning experience. Your scores on these represent 40% of the grade. Each problem will be graded and count as 10 points. The scores will be summed, and the sum scaled so that the maximum is 200 points. You may, and should, discuss problems with fellow students or your professor, but the solutions should be your own. The midterm exam is worth a maximum of 100 points and the final exam is worth a maximum of 200 points. Exams are closed book and closed notes so that the exams also serve as practice for the qual. The maximum total score for the course is 500 points. Grades will be computed using a scheme similar to that used in 517. See the 517 web site to learn how your grade in 517 was computed.