Instructor: Dr. Calvin Johnson  
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Office hours: MW 3-4 TuTh 1-2

Course objectives: Students will master: linear algebra; fundamental postulates of quantum mechanics; quantum mechanics in one-dimension; quantum mechanics in three-dimensions; spin-1/2 systems; the variational principle and applications; other topics in quantum mechanics such as perturbation theory.

Class Web Page: www.physics.sdsu.edu/~johnson/phys610
Note: This web page will have some useful refresher notes on basic mathematics.

Text (required): Principles of Quantum Mechanics, 2nd Ed., R. Shankar

Grading scale: 90% = A, 87% = A-, 83% = B+, 80% = B, 77% = B-, 73% = C+, 70% = C, 67% C-, 63% = D+, 60% = D, 57% = D-, 50% = F.

Grading based on: Homework 20%; 3 in-class tests 50%; Final exam 30%

* There will be weekly homework. You will learn quantum mechanics by doing the homework. QM requires a mastery of technical mathematics skills and the only way to learn these skills is through practice. In other words, expect several hours of homework a week. You may work together, but avoid copying answers; you won't really understand it and your colleague might be wrong. Is it critical to show your work! If you don't show your work, you risk getting NO credit even if the answer is “correct.” Late homework will be docked 50%, and after I have handed out solutions, no homework will be accepted.

* There will be three in-class tests. Closed book, closed notes, no calculators. I will provide a short table of complicated integrals you might need.

The exams will be, unless otherwise announced, Wednesday, March 1, 2017, Wednesday, March 22, 2017 and Wednesday, April 26, 2017.

* The final exam is Monday, May 8, 2017, 3:30 - 5:30 pm in P-149. It will be comprehensive. Closed book, closed notes, no calculators.

* As a courtesy to your fellow students as well as to your instructor, please do not have out your personal devices unless you need them for notetaking or in rare cases where you are expecting an emergency.
* Prerequisites. In addition to the formal prerequisites (see Catalog for details), I expect you to have recently had an undergraduate quantum mechanics course at the level of 410 (Griffiths' book), as well as a mathematical methods course on the level of 342A,B. While I will review much of this material, if this is your first time seeing this material, this is not the course for you: the time-dependent and time-independent Schrodinger equation; observables, expectation values and matrix elements; formal vector spaces and inner product spaces, including function spaces; solutions to linear differential equations; linear algebra, matrix algebra, and matrix eigenvalue problems; differential equations as eigenvalue problems; separation of variables; spherical harmonics; the variational theorem.