Course description: A continuation of the study of quantum mechanics including quantum statistical mechanics, time-independent and time-dependent perturbation theory, and scattering. Prerequisites: PHYS 447. Offered in the Spring semester of even numbered years. One semester; three credits


Instructor: Ted Clarke
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Office: Cooper-Wilson 115. Office hours will be announced in class.

Course objectives: This second course will build on the knowledge and problem solving techniques that were introduced in Quantum I. We will analyze more complicated quantum phenomena with advanced techniques and explore modern applications of quantum theory.

Course content: Time Independent Perturbation Theory
- Perturbed Eigenstates.
- Stark Effect

Hydrogen Atom
- Relativistic Effects
- Spin-Orbit Coupling
- Hyperfine Structure

Many Particle Systems
- Two Particle System
- Identical Particles
- Exclusion

Time Dependent Perturbation
- Phase Space

Charged Particles in an Electromagnetic Field

Radiative Decays
Collision Theory
Scattering
Born Approximation

Grading:  
Mid-Term Exam 25%  
Final Exam 25%  
Homework 40%  
Research Project 10%  

0-59 F 60-69 D 70-79 C 80-89 B 90-100 A  

No make-up exams will be given without a verifiable medical excuse. Late homework will be accepted with an appropriate penalty. As a responsible student, you are expected to attend class. I reserve the right to modify this syllabus as the course develops.