Quantum Mechanics II - Physics 431

Course Information - Fall 2016

Instructor: Jeff Greensite – Thornton 304, greensit@stars.sfsu.edu

Office Hours: TBA

Prerequisites: Physics 430 (Quantum Mechanics I) or equivalent.

Text: The text is my lecture notes. Most of you should already have a copy from Phys. 430; I will arrange to have additional copies printed up if they are needed.

Content: This is the second semester of a two-semester introductory course on quantum mechanics. We will cover the following topics:

1. Electron Spin
2. Addition of Angular Momentum
3. Identical Particles, The Periodic Table
   Neutron Stars, the Fermi Sea
4. Time-Independent Perturbation Theory
5. Time-Dependent Perturbation Theory
6. Scattering Theory - partial waves, Born approximation
7. EPR Paradox, Bell’s Theorem
   The Problem of Measurement
8. The Feynman Path Integral
9. The Quantization of Light

The first six topics will last about two weeks each.

Course Objectives: By the end of the course you should be familiar with the technique of addition of angular momentum, and understand how orbital and spin angular momentum, plus the Pauli Exclusion Principle and Hartree approximation, are able to account for the main features of the Periodic Table. You should also be able to apply basic approximation methods, i.e. perturbation theory, the Born approximation, partial wave analysis, to solve
problems of interest in atomic, nuclear, and particle physics.

**COURSE ORGANIZATION:**

**Lectures:** Tu and Th 12:35-1:50 in TBA.

**Homework:** There will be seven homework assignments to be handed in during the semester. Although these assignments don’t count heavily in the grading, it is essential that you do them. Solutions will be posted on the course website.

**Exams:** There will be two take-home exams: a midterm and a final.

**Grades:**

1. Final - 50%
2. Midterm - 40%
3. Homework - 10%

**Disability Statement**

Students with disabilities who need reasonable accommodations are encouraged to contact the instructor. The Disability Programs and Resource Center (DPRC) is available to facilitate the reasonable accommodations process. The DPRC is located in the Student Service Building and can be reached by telephone (voice/TTY 415-338-2472) or by email (dprc@sfsu.edu).