QUANTUM MECHANICS II
Physics 305, Fall 2005

Lecturer: Prof. Herman Verlinde, Jadwin Hall 325, 8-5585, verlinde@princeton.edu

Lectures: Tuesday, Thursday 11:00-12:20, Jadwin A08

Problem sessions: Tuesday 7:00-11:00 pm, Jadwin 303. TA: Dima Malyshev.

Office hours: Wednesday 3:00-4:30, e-mail or drop in any other time.

Textbooks: Griffiths, Introduction to Quantum Mechanics. There will also be hand-outs.

Class notes: Taking notes and asking questions during class is highly recommended!

Homework: Problem sets will handed out each week. Due in class on Thursdays.

Final Grade: 50% Homework, 15% Midterm Exam, 35% Final Exam.

*** SYLLABUS ***

Short review: Wavefunctions, Observables, Schrödinger Equation (1 lecture)

Electrons in an EM Field: Landau levels, Aharonov-Bohm effect (2 lectures)

Two level systems: Qubits, Neutrino oscillations (1 lecture)

Symmetries: Conserved Charges, Angular momentum (1 lecture)

Many particles: Statistics, Fermi and Bose gas, Band structure (4 lectures)

Time-dependent pert. theory: Golden rule, Radiation of atoms, Laser (4 lectures)

** MIDTERM EXAM **

Scattering: Cross section, Born approximation, Partial waves (2 lectures)

Variational principle: Helium, Quantum dots (2 lectures)

Semi-classical methods: WKB approximation, Application to α-decay (2 lectures)

Entanglement: EPR, Quantum computing, Density matrix (4 lectures)

A short look at some advanced topics: Dirac equation, Path integral (* if time *)