

Quantum Mechanics 660, Fall 2008

Lectures: MWF from 10:30 to 11:20 in room PHYS201.

Instructor: Martin Kruczenski, e-mail:markru@purdue.edu, Office: PHYS252,
Office Hours: Mondays 2pm-4pm.

TA: Lishang Weng.

Textbook: "Modern Quantum Mechanics" by J.J.Sakurai.

Course Webpage: <http://web.ics.purdue.edu/~markru/>

Homework: Every other week selected problems from the textbook are given as homework. The deadline is one week after the problems are given.

Exams: One midterm and one final exams. The dates are to be determined.

Final grading: Final grade is the average of the two exams. If **all** the homework problems were returned in time and were reasonably correct, the final grade will improve.

Grades

The grade scale is from A+ to F or 4 to 0 with the following numerical equivalence:

A ⁺	4.0
A	4.0
A ⁻	3.7
B ⁺	3.3
B	3.0
B ⁻	2.7
C ⁺	2.3
C	2.0
C ⁻	1.7
D ⁺	1.3
D	1.0
D ⁻	0.7
F	0.0

Contents of the course

The course follows Sakurai's book. We study chapters 1 to 3 (except sections 2.5, 2.6, 3.4, 3.8, 3.9,) and appendices A and B. At the end selected topics from chapter 4 may be included as extra material. That means we include

1.1 The Stern Gerlach experiment

1.2 Kets, Bras, and Operators

1.3 Base Kets and Matrix Representations

1.4 Measurements, Observables, and the Uncertainty relation

1.5 Change of Basis

1.6 Position, Momentum, and Translation

1.7 Wave Functions in Position and Momentum Space

2.1 Time Evolution and the Schrödinger equation

2.2 The Schrödinger Versus the Heisenberg Picture

2.3 Simple Harmonic Oscillator

2.4 Schrödinger Wave Equation

3.1 Rotations and Angular Momentum Commutation Relations.

3.2 Spin $\frac{1}{2}$ Systems and Finite Rotations

3.3 $SO(3)$, $SU(2)$ and Euler Rotations

3.5 Eigenvalues and Eigenstates of Angular Momentum

3.6 Orbital Angular Momentum

3.7 Addition of Angular Momenta

3.10 Tensor Operators

Appendix A

Appendix B