

# Introductory Quantum Mechanics (Spring 2008)

January 7, 2008

Day	Date	Topics	Reading	Homework Due
Mon	14 Jan	Measuring “spin”; The quantum state vector	§1.1 thru 1.4	_____
Thu	17 Jan	The mathematics of quantum mechanics	§1.5 thru 2.3	1.1, 1.6, 1.8
Mon	21 Jan	<b>No Classes: Martin Luther King Day</b>		
Thu	24 Jan	Representations; Photons and “Spin-1”	§2.4 thru 2.8	1.3, 1.7, 2.2, 2.6
Mon	28 Jan	Rotations, commutation, and angular momentum	§3.1 thru 3.4	_____
Thu	31 Jan	Uncertainty relations; Spin-1/2 and spin-1	§3.5 thru 3.8	2.3, 2.8, 2.11, 2.12
Mon	4 Feb	Dynamics: Time translation and the Hamiltonian	§4.1 and 4.2	_____
Thu	7 Feb	Precession of spin-1/2; Magnetic resonance	§4.3 and 4.4	3.2, 3.6, 3.18, 4.15
Mon	11 Feb	Dynamics of two-state systems; Energy & time uncertainty	§4.5 thru 4.7	4.11
Thu	14 Feb	<b>Midterm Exam #1 (Through Chapter 4)</b>		
Tue	19 Feb	Adding angular momenta in quantum mechanics	§5.1 thru 5.3	_____
Thu	21 Feb	Wave mechanics from quantum mechanics; The Dirac delta function	§6.1 thru 6.8; App.C	5.1, 5.3, 5.6
Mon	25 Feb	The harmonic oscillator; Raising and lowering operators	§7.1 thru 7.5	_____
Thu	28 Feb	Wave functions in position space; Generating functions	§7.6 thru 7.11	6.1, 6.9, 6.16
Mon	3 Mar	Wave mechanics in three dimensions	§9.1 thru 9.4	_____
Thu	6 Mar	Orbital angular momentum	§9.5 thru 9.10	7.4, 7.6, 9.5, 9.7
<b>10-14 Mar Spring Break</b>				
Mon	17 Mar	Bound states of central potentials; The hydrogen atom	§10.1 and 10.2	_____
Thu	20 Mar	Finite and infinite spherical wells; The 3D harmonic oscillator	§10.3 thru 10.6	9.16, 9.17, 10.2
Mon	24 Mar	Time-independent perturbation theory; Examples	§11.1 and 11.2	10.8
Thu	27 Mar	<b>Midterm Exam #2 (Through Chapter 10)</b>		
Mon	31 Mar	Degenerate perturbation theory; The Stark Effect	§11.3 and 11.4	_____
Thu	3 Apr	Review; Relativity and the Hydrogen atom	§11.6	11.3, 11.5, 11.6, 11.8
Mon	7 Apr	Spin-orbit coupling and the Hydrogen atom	§11.6	_____
Thu	10 Apr	Realistic one-electron atoms; The Zeeman Effect	§11.7 thru 11.9	11.9, 11.10, 11.11, 11.13
Mon	14 Apr	Identical particles; The helium atom	§12.1 and 12.2	_____
Thu	17 Apr	Chemistry	§12.3 and 12.4	11.14, 12.5
Mon	21 Apr	Introduction to scattering theory	§13.1 and 13.2	12.7
Thu	24 Apr	<b>Midterm Exam #3 (Through Chapter 12, except Chapter 8)</b>		
Mon	28 Apr	The Born approximation	§13.2 and 13.3	13.7