

Timetable for Quantum Physics PHY 571/NAN 571

Week 1	Aug. 25:	Blackbody radiation (G p1-5), Photoelectric and Compton effects (G p5-10)
	Aug. 27:	Electron diffraction (G p10-14), Bohr atom (G p15-21)
Week 2	Sep. 1:	no class (Labor Day)
	Sep. 3:	uncertainty principle (Fourier transform) (G p23-34)
Week 3	Sep. 8:	Probability, expectation values, operators, commutation relations (G p34-41)
	Sep. 10:	Schrödinger equation and the eigenvalue problem for a particle in the box (G p44-51)
Week 4	Sep. 15:	First problem set due at the beginning of class (solution on the web) Expansion in basis functions, momentum eigenfunctions, normalization and orthogonality, parity (G p52-62)
	Sep. 17:	Potential step, potential well, and potential barrier (G Ch. 4, p66-75)
Week 5	Sep. 22:	<i>Return first problem set</i> Bound states, double well, delta function limit (G p75-84)
	Sep. 24:	General structure of wave mechanics (Ch. 5, p94-105)
Week 6	Sep. 29:	Expansion postulate, Dirac notation, bra's, ket's, expectation values (G p107-112)
	Oct. 1:	Harmonic oscillator (G p85-89, p112-117)
Week 7	Oct. 6:	Second problem set due at the beginning of class (solution on the web)
	Oct. 8:	Angular momentum (G p120-127)
Week 8	Oct. 13:	<i>Return second problem set</i> Raising and lowering operators, spherical harmonics Review, question session
	Oct. 15:	No class: Midterm exam (open book)
Week 9	Oct. 20:	Expansions in spherical harmonics, 3D Schrödinger equation, Matrix representation of operators
	Oct. 22:	Spin and magnetic resonance (G p158-170), Pauli exclusion principle (G Ch. 13, p199-211)
Week 10	Oct. 27:	Atoms: electronic repulsion, exclusion, and exchange interaction. Periodic table (G Ch. 14, p215-227)
	Oct. 29:	The Hartree-Fock model
Week 11	Nov. 3:	Third problem set due at the beginning of class (solution on the web) The Hartree-Fock model (continued)
	Nov. 5:	Computer lab
Week 12	Nov. 10:	<i>Return third problem set</i> , Computer lab
	Nov. 12:	Time-dependent perturbation theory and transition probability (G Ch. 15, p236-243)
Week 13	Nov. 17:	Selection rules, transition dipole (Ch. 17, p263-267)
	Nov. 19:	QM in spectroscopy: Franck-Condon overlap
Week 15	Nov. 24:	Molecular emission and absorption
	Nov. 26:	Fourth problem set due at the beginning of class (solution on the web) QM in biology: electron transport
Week 16	Dec. 1:	<i>Return fourth problem set</i> , QM in biology: energy transport
	Dec. 3:	QM in nanoscience: quantum confinement

Important dates: Dec. 9: Last day of classes, Dec. 10: reading day, Dec. 15: Final exam 4:50
- 6:40 PM, Dec. 18: Commencement