

# PHYS5702 Quantum Mechanics II (Fall 2018)

Class Schedule as of October 8, 2018

Reading assignments from *Modern Quantum Mechanics, 2e* (Cambridge 2017) by J.J. Sakurai and J. Napolitano

Day	Date	Topics	Reading	HW Due
Tue	28 Aug	Time-Independent Perturbation Theory: The Non-Degenerate Case	5.1	—
Thu	30 Aug	Time-Independent Perturbation Theory: The Degenerate Case	5.2	—
Tue	4 Sep	Applications in One-Electron Atoms: Relativistic Fine Structure	5.3	—
Thu	6 Sep	Applications in One-Electron Atoms: Effects of Static Magnetic Fields	5.3	#1
Tue	11 Sep	The Variational Principle and Simple Applications	5.4	—
Thu	13 Sep	Time-Dependent Potentials and the Interaction Picture	5.5	—
Tue	18 Sep	Adiabatic and Sudden Approximations; Berry's Phase in Quantum Mechanics	5.6	—
Thu	20 Sep	Time-Dependent Perturbation Theory	5.7	#2
Tue	25 Sep	Interactions of Atoms with the Classical Electromagnetic Field	5.8	—
Thu	27 Sep	The Photoelectric Effect: Deriving the Differential Cross Section	5.8	—
Tue	2 Oct	Scattering as a Time-Dependent Perturbation	6.1	—
Thu	4 Oct	The Scattering Amplitude	6.2	—
Tue	9 Oct	The Optical Theorem; The Born Approximation	6.2, 6.3	—
Thu	11 Oct	Partial Waves; The Eikonal Approximation	6.4, 6.5	#3
Tue	16 Oct	Low Energy Scattering and Bound States	6.6	—
Thu	18 Oct	Resonance Scattering	6.7	—
	22-26 Oct	<b>No Class: DNP Meeting</b>		
Tue	30 Oct	Permutation Symmetry; Bosons and Fermions	7.1, 7.2	—
Thu	1 Nov	Two-Electron Systems: Application to the Helium Atom	7.3, 7.4	#4
Tue	6 Nov	Multi-particle States and Second Quantization Formalism	7.5	—
Thu	8 Nov	Quantization of the Electromagnetic Field: The Casimir Effect	7.6	—
Tue	13 Nov	Relativity and Schrödinger's Equation; The Klein-Gordon Equation	8.1	—
Thu	15 Nov	Fixing the Problems: The Klein-Gordon Field	Notes	#5
<b>November 19-23 Thanksgiving Break</b>				
Tue	27 Nov	The Dirac Equation and a New Degree of Freedom	8.2	—
Thu	29 Nov	Symmetries of the Dirac Equation	8.3	—
Tue	4 Dec	Solving the Dirac Equation with a Central Potential; The Hydrogen Atom	8.4	—
Thu	6 Dec	The Path Forward: Relativistic Quantum Field Theory	8.5	#6 (Dec 12)