



16SP_PHY_431_A Quantum Mechanics

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Course Schedule

Physics 431 Course Schedule

Date	Topics	Readings	Problem Assignment
2/1	Introduction Quantum mechanical magic		
2/3	Schrödinger's route to his wave equation	Hey and Walters, Chap. 1-2	
2/5	Wave equation and probability Probability spreadsheet	1.1-1.3.1 pp.1-7 Hamilton-Jacobi and Schrödinger	1.1,3,5
2/8	Mean squared deviation, wave normalization	1.3.1-1.4, pp. 7-15	
2/10	momentum operator	1.5, pp. 15-18	
2/12	ch04_uncertainty_principle.swf Uncertainty principle	1.6, pp. 18-20	
2/15	Stationary states	2.1, pp 24-29	1.7,9,18 2.2 (Due 2/24)
2/17	More stationary states Infinite square well simulation 1		
2/19	Infinite square well Infinite square well simulation 2	2.2, pp.30-38	
2/22	More infinite square well Mathematica movie		
2/24	Harmonic oscillator series solution - finiteness condition	2.3.2, pp 51-54	2.4,5,7 (Plot your series expansion to show that you get the triangle wave. Also create a movie for the probability versus time as a function of time.)
2/26	Harmonic oscillator - Hermite polynomials Harmonic oscillator and infinite square well simulations (choose harmonic oscillator or infinite square well in menu)	2.3.2, pp 54-59	
2/29	Free particle - wave packet and Fourier transform	2.4, pp 59-63	
3/2	Free particle - phase and group velocity Phase and group velocity simulation	2.4, pp 64-65	
3/4	Finite square well		
3/14	Finite square well Finite square well simulation (choose finite square well in	2.6	

	menu)		
3/16	Finite square well		
3/18	Test 1		
3/21	Hilbert space	3.1, pp 93-96	
	Observables		
3/23	Discrete spectra	3.2-3.3.1, pp 96-102	
3.25	Statistical interpretation	3.3.2-3.4, pp 103-109	
3/28	Uncertainty principle	3.5, pp 110-118	2.21 (Use Mathematica to solve and also create a movie) 2.29 (Use Mathematica to solve graphically), 3.6 (Due 4/4)
3/30	Uncertainty principle		
4/1	Schroedinger equation in spherical coordinates	4.1.1-4.1.2, pp 131-140	
4/4	The radial equation The hydrogen atom	4.1.3 - 4.2.1, pp 141-156	
4/6	The spectrum of hydrogen Angular momentum Mechanical Universe chapter 51	4.2.2, pp 157-160 4.3, pp 160-170	
4/8			
4/11			
4/13			
4/15			4.5,10,13,17 (Due 4/27)
4/18			
4/20			
4/22			
4/25			
4/27			
4/29	Semiconductors Feynman Chapter 13		4.27,29,32 (Due 5/6)
5/2	Feynman Chapter 14		
5/4			
5/6			

