UC Berkeley, Physics 137A - Lecture 001
Quantum Mechanics, Spring 2018
Syllabus (Updated: 2/7)

Week	Topics	Notes
Week 1 1/15 - 1/19	Introduction. The Wave Function. Probabilities in Quantum Mechanics.	*No Class on Monday, 1/15* *No Discussion Sections this week.*
Week 2 1/22 - 1/26	Operators and Observables. Expectation Values. Certainty and Uncertainty. The Eigenvalue Equation. Measurement in Quantum Mechanics. The Time-Dependent Schrödinger Equation.	*Discussion Sections start.*
Week 3 1/29 - 2/2	Separation of Variables. The Time-Independent Schrödinger Equation. The Infinite Square Well. Orthonormal Bases of Wave Functions. The Free Particle. The Fourier Transform. The Momentum Space Wave Function.	
Week 4 2/5 - 2/9	Reflection and Transmission. The Finite Square Well - Bound States and Scattering States. Tunneling and the Finite Square Well Barrier. Qualitative Features of Energy Eigenfunctions.	
Week 5 2/12 - 2/16	Sketching Wave Functions. The Simple Harmonic Oscillator. Simple Harmonic Oscillator Energy Eigenfunctions. *-----Here Ends Material for Midterm 1-----* The Double Square Well Toy Model.	
Week 6 2/19 - 2/23	The Double-Finite Well Toy Model (Con't). The Hilbert Space and Kets (Postulate 1). Bras and the Bracket.	*No Class on Monday, 2/19*
Week 7 2/26 - 3/2	Inner Products. Operators. The Observable and Measurement Postulates (Postulates 2 and 3).	**Midterm 1- Monday, 2/26**
Week 8 3/5 - 3/9	Eigenvalues and Eigenvectors. Position and Momentum Eigenbases. The Projection Operator. The Probability and Collapse Postulates (Postulates 4 and 5). Time-Dependence of Quantum States (Postulate 6).	
Week 9 3/12 - 3/16	Time-Dependence of Expectation Values. Commutators. Active and Passive Transformations. Ladder Operator Approach to the Simple Harmonic Oscillator.	
Week 10 3/19 - 3/23	The Uncertainty Principle. *-----Here Ends Material for Midterm 2-----* Multiple Degrees of Freedom in Quantum Systems. The Infinite Cubical Well. Separation of Variables in Spherical Coordinates.	
3/26 - 3/30	*No Class - Spring Break*	
Week 11 4/2 - 4/6	The Angular Equation and Spherical Harmonics. The Radial Equation and Effective Potential. The Infinite Spherical Well. The Hydrogen Atom.	
Week 12 4/9 - 4/13	The Emission Spectrum of Hydrogen. Angular Momentum Eigenfunctions. The Spectrum of Angular Momentum. Spin Angular Momentum.	**Midterm 2 - Monday, 4/9**
Week 13 4/16 - 4/20	Spin-1/2 and the Pauli Spin Matrices. Spin in a Magnetic Field. The Stern-Gerlach Experiment.	
Week 14 4/23 - 4/27	Addition of Angular Momentum. The Clebsch-Gordan Coefficients.	
RRR Week 4/30 - 5/4	*Just for Fun!* Entanglement, Schrödinger's Cat, the Bell Inequalities Review Sessions	*Reading/Review/Recitation Week*
Finals Week 5/7 - 5/11	***Final Exam (Exam Group 4)*** ***Monday, May 7*** ***7:00pm - 10:00pm***	

This syllabus is subject to minor changes. Please pay attention to any announcements online or in lecture. ◊