

Topics

The 448-449 Course should cover most of the following topics:

Review of Bohr Atom and Old Quantum Theory
 Review of Special Relativity
 DeBroglie's Postulate, Davison Germer Experiment, Uncertainty Principle
 Schroedinger Equation, Eigen Functions and Eigen Values, Expectation
 Values and Operators, Basic Postulates of Quantum Mechanics
 Step and Barrier Potentials, Infinite and Finite Square Well, Simple
 Harmonic Oscillator
 Time Independent and Time Dependent Theory
 One-Electron Atom Eigenfunctions and Probability Densities, Angular
 Momentum Operators, Magnetic Moments and Spin, Stern Gerlach, Spin
 Orbit Interaction, L,S, and J, J Coupling
 Exclusion Principle, Helium Atom, Numerical Methods for other Atoms,
 Periodic Table, Alkali Atoms, Zeeman Effect, Transition Rates

Note: 449 should start here or during Exclusion Principle, etc.

X-Ray Production, Spectra, Interaction with Matter
 Molecular Orbitals, Covalent and Ionic Bonding, Splitting of Levels
 and Band
 Formation in Periodic Potentials, Conductors, Semiconductors, and
 Insulators Collision Theory, Born Approximation, Partial Wave Analysis
 Principle Interactions, Gravitational, Electromagnetic, Weak Nuclear
 and Strong Nuclear
 Massless Bosons, Leptons, Mesons, and Baryons, Particles and Antiparticles,
 Conservation of Leptons, Two Neutrino Hypothesis, Conservation of
 Baryons
 Isotopic Spin, Strangeness and Hypercharge, Meson and Baryon Octets,
 Decimet.
 Charge Conjugation, Parity and Time Reversal Operations
 Nuclear Sizes, Optical Model, Liquid Drop Model, Semi-empirical Mass
 Formula, Magic Numbers, Collective Model
 Alpha Decay, Fission, Beta Decay, Excited States