

1. Identical particles
 - Schrödinger equation for N -particle systems
 - Symmetry under two-particle exchange
 - Slater determinant
 - Pauli principle
 - Fermi-Dirac and Bose-Einstein statistics
2. Time-independent perturbation theory
 - Non-degenerate perturbation theory
 - Degenerate perturbation theory
3. The real hydrogen atom
 - Relativistic mass corrections
 - Spin-orbit coupling
 - Zeeman effect
 - Hyperfine splitting
4. The helium atom, the hydrogen molecule, and the structure of larger atoms
 - First order correction to He ground state due to e - e interactions
 - The variational principle
 - The hydrogen molecule ion
 - The periodic table and the shell structure of atoms
5. The WKB Approximation
 - The classical picture
 - Tunnelling and the connection formulae
6. Time dependent perturbation theory and the radiation of atoms
 - Emission and absorption of radiation
 - The golden rule
 - Selection rules
7. The adiabatic approximation and geometric phases
 - The adiabatic theorem
 - Berry's phase
 - The Aharonov-Bohm effect
8. Scattering theory
 - Partial wave analysis
 - Phase shifts
 - The Born approximation
9. Fundamental Issues in Quantum Mechanics
 - The EPR paradox
 - Bell's theorem
 - The no-clone theorem
 - Schrödinger's cat
 - Zeno effect