

These are the main areas from which problems will be drawn. You will have some choice in terms of which problems to answer however the final will require use of the formalism (not surprisingly!) and require a solution to a simple 1D problem like the infinite square well.

Topics for Final:

- Formalism: States, superposition, reduction of superposition, Dirac notation, rotation, time evolution
- Solving Schrödinger's equation: In simple 1D cases, in 3D (e.g. central potentials, radial square well, isotropic oscillator)
- H-atom solutions: the solutions and using the solutions (not the derivation of the solutions)
- Spin and angular momentum: Stern-Gerlach experiments, addition of angular momentum, use of spin wave functions in atomic systems
- EPR: What is it? Entanglement. Uses of EPR pairs (e.g. quantum teleportation)
- Identical particles: effect on wave functions
- Degeneracy: effect on wave functions
- Scattering: Born approximation and partial wave analysis
- Time independent perturbation theory
- Time dependent perturbation theory
- Variational method