

# Further Quantum Physics T.T. 2006

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## Lecture Synopsis

The first couple of lectures will finish off the material from sections 9 and 10 of the HT synopsis. The rest of TT will be taken up with time-dependent physics. Section 7 of the Problems contains questions on this material.

1. **Time dependent potentials** The sudden and adiabatic approximations.
2. **Time dependent perturbation theory** Simple (mainly two-state) systems in a time-dependent potential and the application of time dependent perturbation theory to such problems. Discussion of transitions induced by perturbations.
3. **Selection rules in atomic transitions** Interaction of an atom with the oscillating electric field of e.m. radiation and the dipole matrix element. Use of perturbation theory and angular momentum conservation to derive selection rules.
4. **Fermi's Golden Rule** We won't derive the Golden Rule carefully but will look at applications to decay rates.