

Modern Physics 2 (Physics 0481): Modern Applications of Quantum Physics

Course Summary, Requirements, and References

Winter, 2010

1 Course Summary

1. Many particle systems: exchange symmetry, fermions/bosons, degenerate gases.
2. Multielectron atoms: quantum origins of the periodic table.
3. Statistical mechanics of classical, Fermi and Bose gases.
4. Brief review of Statistical Thermodynamics.
5. Radiation processes in atoms: decay of atomic states, lasers.
6. Solid state physics: conductors, semiconductors, superconductors.
7. Nuclear physics: the binding energy curve, fission, fusion.
8. Elementary particles: the standard model of quarks, leptons and gauge bosons.
9. Introduction to general relativity (if time permits).

2 Course Requirements

The course text will be “Modern Physics”, by Jeremy Bernstein, Paul Fishbane and Stephen Gasiorowicz, (publisher Cummings, April 2000). The grade will be based on problem sets (25%), a midterm exam (25%) and a final exam (50%).