Haverford College - Physics Department
Physics 102b: Classical and Modern Physics II
F. Crawford
Spring 2004 Course Topics

Special Relativity (Hecht Ch. 26): Postulates; Simultaneity; Time Dilation; Length Contraction; Twin Effect; Relativistic Velocity Addition; Relativistic Momentum; Relativistic Energy

Electrostatics (Hecht Ch. 15, 16): Charge; Insulators and Conductors; Coulomb's Law; The Electric Field; Gauss's Law; Electric Potential; Equipotentials; Charge Distributions; Capacitors; Energy in Capacitors

DC Circuits (Hecht Ch. 17, 18): Electric Current; Resistance; Ohm's Law; Resistivity; Voltages; Energy and Power; Current Density; Conductivity; Internal Resistance; Electromotive Force; Resistors in Series and Parallel; RC Circuits; Kirchoff's Rules

Magnetism (Hecht Ch. 19): Magnets; Magnetic Field; Currents and Magnetic Fields; Magnetic Force on Moving Charges; Magnetic Force on Current Wires

Induction (Hecht Ch. 20): Faraday's Induction Law; Motional emf; AC and DC Generators; Inductance; RL Circuits; Field Energy

Light (Hecht Ch. 22): Electromagnetic Waves; Energy and Irradiance; Origin of Radiation; Energy Quanta; Atoms and Light; Electromagnetic Spectrum

Scattering (Hecht Ch. 23): Rayleigh Scattering; Internal and External Reflection, Index of Refraction; Snell's Law; Total Internal Reflection

Geometric Optics (Hecht Ch. 24): Aspherical Lenses; Spherical Thin Lenses; Focal Points and Focal Planes; Single and Combination Lenses; Curved Mirrors

Physical Optics (Hecht Ch. 25): Polarization; Polarizers; Interference; Young's Experiment; Single-Slit Diffraction; Diffraction Gratings; Circular Holes and Obstacles

AC Circuits (Hecht Ch. 21): Alternating Current and Resistance, Inductance, and Capacitance; Reactance and Impedance; LCR Series Circuits; Real and Apparent Power; AC Series Resonance

Quantum Physics (Hecht Ch. 27, 28, 29): Radioactivity; α-particles, β-rays, γ-rays, and X-rays; Atomic Spectra; Radiation Damage; Blackbody Radiation; The Photoelectric Effect; Bremsstrahlung; Compton Effect; Bohr Atom; Lasers; de Broglie Waves; Quantum Numbers; Zeeman Effect; Spin; Uncertainty Principle

Nuclear Physics (Hecht Ch. 30): Radioactive Decay; Half-Life; Fission and Fusion