Physics 102b: Classical and Modern Physics II
Spring 2002 Lecture Topics

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Oscillations (Hecht Ch. 10): Hooke's Law; Simple Harmonic Motion; Elastic Restoring Force; The Pendulum; Damping, Forcing, and Resonance

Waves and Sound (Hecht Ch. 11): Wave Characteristics; Transverse and Compression Waves; Sound Waves; Wavefronts and Intensity; The Speed of Sound; Sound Level; Sound Beats; Standing Waves; The Doppler Effect

Electrostatics (Hecht Ch. 15, 16): Positive and Negative Charge; Insulators and Conductors; Coulomb's Law; The Electric Field; Gauss's Law; The Electric Potential; Equipotentials; Potential of 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; Ammeters and Voltmeters; 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

Light (Hecht Ch. 22): Electromagnetic Waves; Wave Propagation; Energy and Irradiance; The Origin of Radiation; Energy Quanta; Atoms and Light; The 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; Natural Light; 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, X-rays; Rutherford Scattering; Atomic Spectra; Blackbody Radiation; The Photoelectric Effect; The Bohr Atom; Lasers; de Broglie Waves; Complementarity; Schroedinger's Equation; Quantum Numbers; The Zeeman Effect; Spin; The Pauli Exclusion Principle; The Uncertainty Principle