

AP Physics 2: Giancoli Chapters

UNIT 1: Fluid Mechanics

Giancoli chapter 10: Fluids **pg 260**

- Phases of Matter
 - Density and Specific Gravity
 - Pressure in Fluids
 - Atmospheric Pressure and Gauge Pressure
 - Pascal's Principle
 - Buoyancy and Archimedes' Principle
 - Fluids in Motion; Flow Rate and the Equation of Continuity
 - Bernoulli's Equation
 - Applications of Bernoulli's Principle: Torricelli, Airplanes, Baseballs, Blood Flow
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UNIT 2: Thermodynamics

Giancoli chapter 13: Temperature and Kinetic Theory **pg 359**

- Atomic Theory of Matter
- Temperature and Thermometers
- Thermal Equilibrium and the Zeroth Law of Thermodynamics
- Thermal Expansion
- The Gas Laws and Absolute Temperature
- The Ideal Gas Law
- Problem Solving with the Ideal Gas Law
- Ideal Gas Law in Terms of Molecules: Avogadro's Number
- Kinetic Theory and the Molecular Interpretation of Temperature

Giancoli chapter 14: Heat **pg 390**

- Heat as Energy Transfer
- Internal Energy
- Specific Heat
- Calorimetry – Solving Problems
- Latent Heat
- Heat Transfer – Conduction
- Heat Transfer – Convection
- Heat Transfer - Radiation

Giancoli chapter 15: The Laws of Thermodynamics **pg 412**

- The First Law of Thermodynamics
- Thermodynamic Processes and the First Law
- The Second Law of Thermodynamics – Introduction
- Heat Engines
- Entropy and the Second Law of Thermodynamics

Unit 3: Electrostatics

Giancoli chapter 16: Electric Charge and Electric Field **pg 443**

- Static Electricity; Electric Charge and Its Conservation
- Electric Charge in the Atom
- Insulators and Conductors
- Induced Charge; the Electroscope
- Coulomb's Law
- Solving Problems Involving Coulomb's Law and Vectors
- The Electric Field
- Electric Field Lines
- Electric Fields and Conductors

Giancoli chapter 17: Electric Potential **pg 473**

- Electric Potential Energy and Potential Difference
- Relation between Electric Potential and Electric Field
- Equipotential Lines and Surfaces
- The Electron-Volt, a Unit of Energy
- Electric Potential Due to Point Charges
- Capacitance
- Dielectrics
- Storage of Electric Energy

Unit 4: Electric Currents

Giancoli chapter 17: Electric Potential **pg 473**

- Capacitance
- Dielectrics
- Storage of Electric Energy

Giancoli chapter 18: Electric Currents **pg 501**

- The Electric Battery
- Electric Current
- Ohm's Law: Resistance and Resistors
- Resistivity
- Electric Power

Giancoli chapter 19: DC Circuits **pg 526**

- EMF and Terminal Voltage
- Resistors in Series and in Parallel
- Kirchhoff's Rules

Unit 5: Magnetism

Giancoli chapter 20: Magnetism pg 560

- Magnets and Magnetic Fields
- Electric Currents Produce Magnetic Fields
- Force on an Electric Current in a Magnetic Field; Definition of B
- Force on an Electric Charge Moving in a Magnetic Field
- Magnetic Field Due to a Long Straight Wire
- Force between Two Parallel Wires

Giancoli chapter 21: Electromagnetic Induction and Faraday's Law pg 590

- Induced EMF
- Faraday's Law of Induction; Lenz's Law
- EMF Induced in a Moving Conductor
- Changing Magnetic Flux Produces an Electric Field
- Electric Generators
- Applications of Induction

Unit 6: Waves and Optics

Giancoli chapter 11: Oscillations and Waves **pg 292**

- Wave Motion
- Types of Waves and their Speeds: Transverse and Longitudinal
- Interference; Principle of Superposition

Giancoli chapter 22: Electromagnetic Waves **pg 625**

- Light as an Electromagnetic Wave and the Electromagnetic Spectrum

Giancoli chapter 23: Light: Geometric Optics **pg 644**

- The Ray Model of Light
- Reflection; Image Formation by a Plane Mirror
- Formation of Images by Spherical Mirrors
- Index of Refraction
- Refraction: Snell's Law
- Total Internal Reflection; Fiber Optics
- Thin Lenses; Ray Tracing

Giancoli chapter 24: The Wave Nature of Light **pg 679**

- Waves vs. Particles
- Interference – Young's Double-Slit Experiment
- The Visible Spectrum and Dispersion
- Diffraction by a Single Slit or Disk
- Diffraction Grating
- Interference in Thin Films
- Polarization
- Liquid Crystal Displays (LCD)

Unit 7: Modern Physics

Giancoli chapter 27: Early Quantum Theory and Models of the Atom **pg 771**

- Discovery and Properties of the Electron
- Blackbody Radiation; Planck's Quantum Hypothesis
- Photon Theory of Light and the Photoelectric Effect
- Energy, Mass, and Momentum of a Photon
- Compton Effect
- Photon Interactions; Pair Production
- Wave-Particle Duality; the Principle of Complementarity
- Wave Nature of Matter
- Early Models of the Atom
- Atomic Spectra: Key to the Structure of the Atom
- The Bohr Model
- deBroglie's Hypothesis Applied to Atoms

Giancoli chapter 30: Sound **pg 857**

- Structure and Properties of the Nucleus
- Binding Energy and Nuclear Forces
- Radioactivity
- Alpha Decay
- Beta Decay
- Gamma Decay
- Conservation of Nucleon Number and Other Conservation Laws
- Half-Life and Rate of Decay
- Radioactive Dating
- Detection of Particles

Giancoli chapter 31: Nuclear Energy; Effects and Uses of Radiation **pg 885**

- Nuclear Reactions and the Transmutation of Elements
- Nuclear Fission; Nuclear Reactors
- Nuclear Fusion