

SECTION OVERVIEW

Unit 3: Classical Physics - Thermodynamics, Electricity and Magnetism, and Light

Chapter 8: Thermal Physics

- 8.1: Introduction to Thermal Physics
- 8.2: Temperature
- 8.3: The Ideal Gas Law
- 8.4: Heat
- 8.5: Heat Transfer Methods
- 8.6: Temperature Change and Heat Capacity
- 8.7: Phase Change and Latent Heat
- 8.8: The First Law of Thermodynamics
- 8.9: The First Law of Thermodynamics and Heat Engine Processes
- 8.10: Introduction to the Second Law of Thermodynamics- Heat Engines and Their Efficiency
- 8.11: Carnot's Perfect Heat Engine- The Second Law of Thermodynamics Restated
- 8.12: Applications of Thermodynamics- Heat Pumps and Refrigerators
- 8.13: Entropy and the Second Law of Thermodynamics- Disorder and the Unavailability of Energy
- 8.14: Statistical Interpretation of Entropy and the Second Law of Thermodynamics- The Underlying Explanation
- 8.E: Thermal Physics (Exercises)

Chapter 9: Electricity

- 9.1: Introduction to Electricity
- 9.2: Static Electricity and Charge- Conservation of Charge
- 9.3: Coulomb's Law
- 9.4: Electric Field- Concept of a Field Revisited
- 9.5: Electric Field Lines
- 9.6: Electric Potential and Potential Energy
- 9.7: Conductors and Applications of Electrostatics
- 9.8: Current
- 9.9: Ohm's Law- Resistance and Simple Circuits
- 9.10: Electric Power and Energy
- 9.11: Resistors in Series and Parallel
- 9.12: Electric Hazards and the Human Body
- 9.E: Electricity (Exercise)

Chapter 10: Magnetism

- 10.1: Introduction to Magnetism
- 10.2: Magnets
- 10.3: Ferromagnets and Electromagnets
- 10.4: Magnetic Fields and Magnetic Field Lines
- 10.5: Magnetic Field Strength- Force on a Moving Charge in a Magnetic Field
- 10.6: Magnetic Force on a Current-Carrying Conductor
- 10.7: Motors and Meters
- 10.8: Magnetic Fields Produced by Currents- Ampere's Law

- 10.9: Induced Voltage and Magnetic Flux
- 10.10: Faraday's Law of Induction- Lenz's Law
- 10.11: Transformers
- 10.12: Alternating Current versus Direct Current
- 10.E: Magnetism (Exercise)

Chapter 11: Light

- 11.1: Introduction to Light
- 11.2: Maxwell's Equations- Electromagnetic Waves Predicted and Observed
- 11.3: Production and Properties of Electromagnetic Waves
- 11.4: The Electromagnetic Spectrum- an Overview
- 11.5: The Electromagnetic Spectrum- Application Notes
- 11.6: Reflection
- 11.7: Refraction
- 11.8: Dispersion- The Rainbow and Prisms
- 11.9: Image Formation by Lenses
- 11.10: Image Formation by Mirrors
- 11.11: Polarization
- 11.E: Light (Exercises)

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