

PHYS 1402
General College Physics II
Required Topics

All instructors must cover the following sections from the approved text, *College Physics*, 6th edition by Wilson, Buffa and Lou. These constitute the minimum course content. Any or all additional sections in the textbook, or additional supplementary material not covered in the textbook, may be added at the instructor's discretion.

Chapter 15: Electric Charge, Forces and Fields

- 15.1 Electric Charge
- 15.2 Electrostatic Charging
- 15.3 Electric Force
- 15.4 Electric Field
- 15.5 Conductors and Electric Fields

Chapter 16: Electric Potential, Energy and Capacitance

- 16.1 Electric Potential Energy and Electric Potential Difference
- 16.2 Equipotential Surfaces and the Electric Field
- 16.3 Capacitance
- 16.4 Dielectrics
- 16.5 Capacitors in Series and in Parallel

Chapter 17: Electric Current and Resistance

- 17.1 Batteries and Direct Current
- 17.2 Current and Drift Velocity
- 17.3 Resistance and Ohm's Law
- 17.4 Electric Power

Chapter 18: Basic Electric Circuits

- 18.1 Resistance in Series, Parallel, and Series-Parallel Combinations
- 18.2 Multiloop Circuits and Kirchhoff's Rules
- 18.3 RC Circuits
- 18.5 Household Circuits and Electrical Safety

Chapter 19: Magnetism

- 19.1 Magnets, Magnetic Poles, and Magnetic Field Direction
- 19.2 Magnetic Field Strength and Magnetic Force
- 19.3 Applications: Charged Particles in Magnetic Fields

- 19.4 Magnetic Forces on Current-Carrying Wires
- 19.5 Applications: Current-Carrying Wires in Magnetic Fields
- 19.6 Electromagnetism: The Source of Magnetic Fields

Chapter 20: Electromagnetic Induction and Waves

- 20.1 Induced emf: Faraday's Law and Lenz's Law
- 20.2 Electric Generators and Back emf
- 20.3 Transformers and Power Transmission
- 20.4 Electromagnetic Waves

Chapter 21: AC Circuits

- 21.1 Resistance in an AC Circuit
- 21.2 Capacitive Reactance
- 21.3 Inductive Reactance
- 21.4 Impedance: RLC Circuits
- 21.5 Circuit Resonance

Chapter 22: Reflection and Refraction of Light

- 22.1 Wave Fronts and Rays
- 22.2 Reflection
- 22.3 Refraction
- 22.4 Total Internal Reflection and Fiber Optics
- 22.5 Dispersion

Chapter 23: Mirrors and Lenses

- 23.1 Plane Mirrors
- 23.2 Spherical Mirrors
- 23.3 Lenses
- 23.4 The Lens Maker's Equation

Chapter 24: Physical Optics: The Wave Nature of Light

- 24.1 Young's Double-Slit Experiment
- 24.2 Thin-Film Interference
- 24.3 Diffraction

Chapter 25: Vision and Optical Instruments

- 25.1 The Human Eye
- 25.2 Microscopes

25.3 Telescopes

25.4 Diffraction and Resolution

Chapter 26: Relativity

26.1 Classical Relativity and the Michelson-Morley Experiment

26.2 The Postulates of Special Relativity and the Relativity of Simultaneity

26.4 Relativistic Kinetic Energy, Momentum, Total Energy and Mass-Energy Equivalence

Chapter 27: Quantum Physics

27.1 Quantization: Planck's Hypothesis

27.2 Quanta of Light: Photons and the Photoelectric Effect

27.4 The Bohr Theory of the Hydrogen Atom

Chapter 28: Quantum Mechanics and Atomic Physics

28.1 Matter Waves: The de Broglie Hypothesis

Chapter 29: The Nucleus

29.1 Nuclear Structure and the Nuclear Force

29.2 Radioactivity

29.3 Decay Rate and Half-Life

29.4 Nuclear Stability and Binding Energy

Chapter 30: Nuclear Reactions and Elementary Particles

30.1 Nuclear Reactions

30.2 Nuclear Fission

30.3 Nuclear Fusion