

# University Physics 2 (PHY2423) – Course Objectives

Created by Dr. Scott Schneider – Revised 01/24/05

- Study the properties of light and the electromagnetic spectrum.
- Solve problems involving refraction and total internal reflection of light.
- Calculate the final intensity and polarization direction from a series of polarizers.
- Study the properties of polarization by reflection, absorption, scattering.
- Calculate the locations of final images from real or virtual objects in systems containing converging or diverging lenses or mirrors.
- Demonstrate knowledge of how to ray-trace light through converging and diverging lenses.
- Solve problems involving multiple lenses (eyeglasses/telescopes/microscopes).
- Solve problems involving masses on springs (introduction to wave motion).
- Investigate traveling waves and interference/superposition of waves (constructive/destructive interference).
- Solve problems involving the Doppler effect.
- Calculate the locations of bright and dark (constructive and destructive interference) locations in single or multiple slit systems.
- Investigate phasor diagrams for multiple slits.
- Find the net electric field (or electric force) from a collection of discrete electric charges.
- Integrate to find the net electric field from continuous charge distributions.
- Solve problems involving electric potentials (discrete and continuous).
- Calculate the total resistance of a circuit containing a mixture of series and parallel resistances.
- Use Kirchhoff's Laws to find the currents in multi-loop circuits.
- Calculate the total capacitance of a circuit containing a mixture of series and parallel capacitances.
- Study the effects of adding dielectrics to capacitors.
- Calculate voltages and currents in resistor-capacitor charging/discharging circuits.
- Demonstrate knowledge of the various right-hand rules associated with magnetic fields and moving charges.
- Calculate the torque on current-carrying loops in magnetic fields
- Study the Hall effect to determine the sign of the charge carriers.
- Study the magnetic fields created by straight wires and coils.
- Investigate the effect of a changing magnetic flux on coils (induced currents - laws of Faraday and Lenz).
- Calculate voltages and currents in RLC alternating current circuits.
- Demonstrate ability to identify phasor relationships between circuit elements in RLC circuits.
- Study the properties of transformers and motors.