

Print Date: 11/4/19  
**Spokane Community College**  
**Course Learning Outcomes and Outline**

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**Course Title:** General Physics  
**Prefix and Course Number:** PHYS 102

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**Course Learning Outcomes:**

**By the end of this course, a student should be able to:**

- Explain physics principles and state pertinent facts pertaining to thermodynamics, light, waves and optics.
- Solve problems using physics principles and facts
- Recognize how physics applies to related areas
- Perform laboratory experiments, record observations, gather and analyze data, and present the results in written form.

**Course Outline:**

- I. Temperature and Heat
  - A. Temperature measurements and Temperature Scales
  - B. Thermal Expansion
  - C. Heat and Internal Energy
  - D. Specific Heat Capacity
  - E. Heat and Phase Changes
  - F. Concepts and Problems
- II. The Transfer of Heat
  - A. Convection, Conduction and Radiation.
  - B. Concepts and Problems
- III. The Ideal Gas Law and Kinetic Theory
  - A. Molecular Mass, Mole and Avogadro's Number
  - B. The Ideal Gas Law
  - C. Kinetic Theory of Gases
  - D. Diffusion
  - E. Concepts and Problems
- IV. Thermodynamics
  - A. Thermodynamic Systems
  - B. Thermodynamic Laws and Thermal Processes
  - C. Heat Engines and Carnot Principle
  - C. Entropy
  - D. Concepts and Problems
- V. Waves and Sound
  - A. Wave Nature and its mathematical description
  - B. Sound and Sound Intensity.
  - C. Sound applications
  - D. Doppler Effect
  - E. Concepts and Problems
- VI. The Principle of Linear Superposition and Interference Phenomena
  - A. Principle of linear superposition.
  - B. Sound Interference
  - C. Diffraction and Beats
  - D. Standing Waves
  - E. Concepts and Problems

- VII. Electromagnetic Waves
  - A. Nature of Electromagnetic Waves and Electromagnetic Spectrum
  - B. Speed of Light
  - C. Energy carried by Electromagnetic Waves
  - D. Doppler Effect and Electromagnetic Waves
  - E. Light Polarization
  - F. Concepts and Problems
- VIII. Reflection of Light: Mirrors
  - A. Wave Fronts and Rays
  - B. Light Reflection
  - C. Image formation by a plane mirror
  - D. Spherical mirrors and image formation by the spherical mirrors
  - E. Mirror Equation and Magnification Equation.
  - F. Concepts and Problems
- IX. Refraction of Light and Optical Instruments
  - A. Index of refraction and Snell's Law
  - B. Total Internal Reflection
  - C. Polarization and the Reflection and Refraction of Light.
  - D. Light Dispersion
  - E. Lenses and Image Formation
  - F. Thin Lens Equation and Magnification Equation
  - G. Lens Combinations
  - H. Human Eye, Magnifying Glass, Compound Microscope and The Telescope
  - I. Lens Aberration
  - J. Concepts and Problems
- X. Interference and the Wave Nature of Light
  - A. Principle of Superposition
  - B. Young's Double Slit Experiment
  - C. Thin-Film Interference
  - D. The Michelson Interferometer
  - E. Diffraction and Diffraction Gratings
  - F. Resolving Power
  - G. X-ray Diffraction
  - H. Concepts and Problems