BAKER COLLEGE
STUDENT LEARNING OUTCOMES

PHY2520 General Physics II
4 Semester Hours

Student Learning Outcomes & Enabling Objectives

1. Explain the concepts of electric charges, forces, and electric fields.
    a. Describe the charge model
    b. Differentiate isolators and conductors.
    c. Solve problems involving electric charges and Coulomb's law.
    d. Interpret the concept of electric field.
        i. Determine the electric field of single and multiple point charges.
        ii. Determine the electric field of continuous charge distributions.
        iii. Determine the electric field of rings, disks, planes and spheres
2. Examine Gauss's Law.
    a. Describe electric field lines.
    b. Calculate electric flux.
    c. Solve problems of electrostatic equilibrium.
3. Interpret the concepts of electric fields.
    a. Describe electric potential and potential difference.
    b. Explain the relation between potential and electric field.
    c. Define capacitance and capacitors.
    d. Explain energy in the electric field.
4. Explain concepts related to electric current and electric circuits.
    a. Define current, current density, conductivity and resistivity.
    b. Solve problems involving resistance and Ohm's law.
    c. Analyze Kirchhoff's laws.
    d. Explain electric energy and power.
5. Explain the concepts of magnetic fields and forces.
    a. Explain the Biot-Savart law.
    b. Determine the magnetic field of moving charges and electric currents.
    c. Explain Ampere's law and solenoids.
    d. Determine magnetic force on moving charges and current carrying wires.
6. Interpret electromagnetic induction and Faraday's law.
    a. Define magnetic flux and Lenz's law.
    b. Determine the induced emf of a solenoid.
    c. Explain transformers and inductors.

7. Examine electromagnetic fields and waves.
    a. Examine Maxwell's equations.
    b. Define the properties of electromagnetic waves.
    c. Solve problems involving electromagnetic fields and waves.
8. Examine AC circuits.
    a. Define resistor, capacitor, and inductor circuits.
    b. Determine power and power factor in RLC circuits.
9. Analyze oscillatory motion and wave motion.
    a. Describe simple harmonic motion.
    b. Solve problems involving the vertical mass-spring system and the simple pendulum.
    c. Differentiate transverse and longitudinal waves.
    d. Describe the wave equations.
    e. Perform calculations of transverse waves along a stretched string.
10. Explain the concepts of superposition and interference.
    a. Analyze standing waves.
    b. Describe constructive and destructive interference.
11. Interpret the concepts of reflection and refraction of light, images and optics.
    a. Describe the ray model of light.
    b. Apply ray tracing to find images produces by mirrors and lenses.
    c. Apply Snell's law to solve refraction problems.
    d. Describe virtual and real images, focal length, diverging and converging lenses.
    e. Perform calculations using the lens makers' equation.
12. Interpret the concepts of interference and diffraction in physical optics.
    a. Analyze Huygens' Principle and the Rayleigh Criterion.
    b. Describe optical instruments.
    c. Solve problems involving the diffraction grating.
13. Examine the transition from classical to contemporary physics.
    a. Describe the photoelectric effect and the concept of photon.
    b. Describe the Bohr atomic theory and atomic spectra.

Laboratory Student Learning Outcomes and Enabling Objectives

14. Conduct experimental laboratories applying concepts from lecture.
    a. Observe lab safety and proper procedures.
    b. Collect experimental data.
    c. Analyze data.
    d. Perform calculations.
    e. Interpret the results of the experiments.
15. Write professional laboratory reports using quality technical writing skills.
    a. Create well-formatted and -labelled graphs and diagrams.
    b. Compose clear, scientifically sound reports using appropriate physics nomenclature.

These SLOs are not approved for experiential credit.

Effective: Spring 2018