BAKER COLLEGE
STUDENT LEARNING OUTCOMES

PHY2510 General Physics I
4 Semester Hours

Student Learning Outcomes & Enabling Objectives

1. Explain the principles of kinematics.
    a. Describe the International System of units (SI), dimensional analysis, scientific notation, significant digits and their uses.
    b. Differentiate vector and scalar quantities.
    c. Explain distance vs. displacement and speed vs. velocity.
    d. Discuss average and instantaneous velocity and acceleration.
    e. Apply the equations of motion to solve kinematics problems
2. Analyze Newton's Law of motion.
    a) Discuss force and force components.
    a. Identify different forces.
    b. Draw free-body diagrams.
    c. Explain the concept of equilibrium.
    d. Solve dynamics problems.
3. Apply dynamics concepts.
    a. Solve problems involving projectile motion.
    b. Solve problems involving uniform circular motion.
    c. Solve problems involving friction.
4. Explain momentum and the law of conservation of momentum.
    a. Solve problems involving impulse.
    b. Solve problems involving elastic collisions.
    c. Solve problems involving inelastic collisions.
5. Examine work, energy and power, and the law of conservation of energy.
    a. Define potential and kinetic energy.
    b. Define gravitational and elastic potential energy.
    c. Solve problems involving the law of conservation of energy.
6. Discuss rotational motion.
    a. Define angular velocity and angular acceleration.
    b. Explain center of mass and rotational inertia.
    c. Explain torque, angular momentum, and rotational kinetic energy.
    d. Solve problems involving rotational kinematics and dynamics.
7. Examine the concepts of fluid statics and dynamics.
    a. Define pressure.
    b. Explain Pascal’s principle, Archimedes’ principle and Bernoulli’s equation.

    c. Solve problems involving fluid statics and dynamics.
8. Interpret the concepts of thermodynamics.
    a. Explain temperature, heat, and phase change.
    b. Perform calculations with temperature scales, heat capacity, and specific heat.
    c. Conceptualize the model of the ideal gas.
    d. Perform calculations using the ideal gas law.
    e. Analyze the kinetic theory of ideal gases.
9. Analyze the laws of thermodynamics.
    a. Examine the first law of thermodynamics.
        i. Predict work, heat, and internal energy change for various thermodynamic processes.
        ii. Solve problems involving the first law of thermodynamics.
    b. Examine the second law of thermodynamics.
        i. Interpret the concepts of reversibility, and entropy.
        ii. Analyze heat engines and refrigerators.
        iii. Solve problems involving the second law of thermodynamics

Laboratory Student Learning Outcomes and Enabling Objectives

10. 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.
11. 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: Fall 2017