# PHYS G111: CONCEPTUAL PHYSICS LAB

| Item | Value |
|---|---|
| Curriculum Committee Approval Date | 05/02/2023 |
| Top Code | 190200 - Physics, General |
| Units | 1 Total Units |
| Hours | 54 Total Hours (Lab Hours 54) |
| Total Outside of Class Hours | 0 |
| Course Credit Status | Credit: Degree Applicable (D) |
| Material Fee | No |
| Basic Skills | Not Basic Skills (N) |
| Repeatable | No |
| Grading Policy | Standard Letter (S),<br>• Pass/No Pass (B) |
| California General Education Transfer Curriculum (Cal-GETC) | • Cal-GETC 5C Laboratory Activity (5C) |
| Intersegmental General Education Transfer Curriculum (IGETC) | • IGETC 5C Laboratory Activity (5C) |
| California State University General Education Breadth (CSU GE-Breadth) | • CSU B3 Laboratory Activity (B3) |

## Course Description

This course is designed to supplement PHYS G110. The student will do laboratory exercises which illustrate some of the phenomena discussed in PHYS G110. PREREQUISITE: PHYS G110. Transfer Credit: CSU; UC: Credit Limitation: No credit for PHYS G110, PHYS G111 if taken after PHYS G120 or PHYS G185.

## Course Level Student Learning Outcome(s)

1. Course Outcomes
2. Describe various phenomena associated with motion, energy, waves, or electromagnetism.
3. Explain observations based on current physics theory.
4. Generate a written report describing observations.

## Course Objectives

- 1. Explain vector addition.
- 2. Relate gravitational force to masses of objects and distance between objects.
- 3. Solve for the direction of motion given multiple forces.
- 4. Describe a model for friction at the molecular level.
- 5. Locate where an object will land given its initial conditions.
- 6. Apply the law of conservation of momentum to solve collision problems.
- 7. Describe the different types of energy.
- 8. Explain basic electricity relationships in series and parallel circuits.
- 9. Use measurements to determine Coulombs constant.
- 10. List the variables that affect the strength and direction of the electric field for a static arrangement of charges.
- 11. Explain what happens when a magnet moves through an electrical coil at different speeds.

## Lecture Content

Not applicable

## Lab Content

Vectors Kinematics Forces and Friction Two-Dimensional Projectile Motion Two-Dimensional Collisions Energy Conductivity Coulombs Law Electric Fields Faradays Law

## Method(s) of Instruction

- Lab (04)

## Reading Assignments

Instructor prepared hand-outs.

## Writing Assignments

Formal lab report based upon critical thinking (evaluation of data).

## Out-of-class Assignments

None required.

## Demonstration of Critical Thinking

Students will draw conclusions about the physical world from data collected in lab exercises.

## Required Writing, Problem Solving, Skills Demonstration

Formal lab report based upon critical thinking (evaluation of data).

## Eligible Disciplines

Physics/Astronomy: Masters degree in physics, astronomy, or astrophysics OR bachelors degree in physics or astronomy AND masters degree in engineering, mathematics, meteorology, or geophysics OR the equivalent. Masters degree required.

## Manuals Resources

1. Gilpin, B. Lab Syllabus, Golden West College , 01-01-2023 2. PASCO Scientific. PASCO Scientifics Physics Labs with Computers, PASCO Scientific , 01-01-2023

## Software Resources

1. PhET Simulations. University of Colorado Boulder, 2023 ed.