

EASTERN ARIZONA COLLEGE

Physical Concepts

Course Design

2016-2017

Course Information

Division Science
Course Number PHY 107
Title Physical Concepts
Credits 4
Developed by Madhuri Bapat
Lecture/Lab Ratio 3 Lecture/3 Lab

Transfer Status

ASU	NAU	UA
PHY 101, Natural Science - Quantitative (SQ)	PHS 101; Lab Science [LAB] NAU Personalized Learning: PHSI 102L; Lab Science [LAB]	PHYS Dept. Elective, Tier 1 & 2 Natural Sciences (NS)

Activity Course No
CIP Code 40.0801
Assessment Mode Pre/Post Test (75 Questions/75 Points)
Semester Taught Fall and Spring
GE Category Lab Science
Separate Lab Yes
Awareness Course No
Intensive Writing Course No

Prerequisites

ENG 091 with a grade of "C" or higher or reading placement test score as established by District policy.

Educational Value

Anybody who is interested in physics. Refresher course for engineering, medicine, math, physics, geology and chemistry majors. Transfer course for non-science majors.

Description

Students are introduced to basic physical concepts in mechanics, fluids, heat, sound, optics, electricity, magnetism, atomic and nuclear physics. Recommend completion of one year of high school algebra.

Supplies

Calculator

Competencies and Performance Standards

1. Distinguish between scientific and non-scientific phenomena.

Learning objectives

What you will learn as you master the competency:

- a. Analyze events, phenomena for being scientific vs. socially acceptable.
- b. Analyze events or phenomena for being scientific vs. religious belief.
- c. Articulate domains of science, art and religion.

Performance Standards

You will demonstrate your competence:

- o during class discussions

Your performance will be successful when:

- o learner identifies the differences in scientific and non-scientific phenomena
- o learner identifies the domains of science, art and religion

2. Analyze day-to-day situations (household appliances, phenomena in nature) using concepts in mechanics, fluid mechanics, heat and thermodynamics, electricity, magnetism and electromagnetism, light and optics, atomic and nuclear physics.

Learning objectives

What you will learn as you master the competency:

- a. Investigate linear motion by describing it in terms such as displacement, velocity, acceleration, force, and momentum.
- b. Apply law of conservation of momentum and energy to analyze interactions between two objects.
- c. Investigate energy in its various forms such as potential (gravitational, elastic, electrical) and kinetic (mechanical, sound, heat, solar, light)
- d. Investigate sound phenomena such as echo, resonance, and Doppler effect.
- e. Investigate light phenomena such as reflection, refraction, dispersion, total internal reflection, scattering.
- f. Investigate heat phenomena such as expansion, change of state of matter and heat gained and lost by matter.
- g. Investigate electricity and magnetism phenomena using Coulomb's law, Ohm's law, Kirchhoff's law, Ampere's law and Faraday law.
- h. Investigate logic behind the periodic table.
- i. Investigate radioactivity, nuclear fission and fusion phenomena.
- j. Compare and contrast four fundamental forces in nature.

Performance Standards

You will demonstrate your competence:

- o on homework
- o on tests
- o during labs
- o during class discussions

Your performance will be successful when:

- o learner can use simple laws of motion to solve problems
- o learner criticizes difference in speed and velocity, force and pressure, heat and

- temperature, voltage and current, intensity and energy, loudness and pitch
- learner can explain the functioning of household appliances
- learner can explain phenomena in nature

3. Use computer software and hardware including graphical analysis, data studio, and sensors adequately.

Learning objectives

What you will learn as you master the competency:

- a. Interpret the graphs of motion using computer.
- b. Draw graphs using graphical analysis and by hand.

Performance Standards

You will demonstrate your competence:

- during labs
- on homework
- on tests

Your performance will be successful when:

- learner can draw graph to describe motion and describe motion using graphs

4. Use lab equipment, new and old, adequately.

Learning objectives

What you will learn as you master the competency:

- a. Identify the limitations of the equipment.
- b. Identify and justify the factors affecting the discrepancy in expected and actual results.

Performance Standards

You will demonstrate your competence:

- during labs

Your performance will be successful when:

- learner can point out sources of errors in experiment

Types of Instruction

Classroom presentation, demonstrations, and discussions

Laboratories

Grading Information

Grading Rationale

Students are tested for their conceptual understanding, critical thinking, and application skills. Students have to show all the work and answer in complete sentences to get full credit for homework, lab report, etc.

Pre test	0%
Labs	30%
Homework	10%

Collaborative activity	10%
Tests	30%
Attendance/Quizzes	10%
Post test	10%

Grading Scale

A	88% and above
B	78 to 87.9%
C	68 to 77.9%
D	58 to 67.9%
F	Below 57.9%