PHYS 111 - Descriptive Physics Laboratory Course Outline

Approval Date: 05/12/2022
Effective Date: 08/26/2024

SECTION A

Unique ID Number	CCC000091063
Discipline(s)	Physics/Astronomy
Division	Science and Engineering
Subject Area	Physics
Subject Code	PHYS
Course Number	111
Course Title	Descriptive Physics Laboratory
TOP Code/SAM Code	1902.00 - Physics, General / E - Non-Occupational
Rationale for adding this course to the curriculum	change Physics 110 co-req to: pre-req or co-req
Units	1
Cross List	*N/A*
Typical Course Weeks	18

Total Instructional Hours

	Contact Hours
Lecture	0.00
Lab	54.00
Activity	0.00
Work Experience	0.00
Outside of Class Hours	0.00

Total Contact Hours	54
Total Student Hours	54
Open Entry/Open Exit	No
Maximum Enrollment	
Grading Option	Letter Grade or P/NP
Distance Education Mode of Instruction	On-Campus

SECTION B

General Education Information:

SECTION C

Course Description

Repeatability	May be repeated 0 times
Catalog Description	A non-mathematical, descriptive physics laboratory for non-science majors. This class is an optional companion to the lecture course PHYS 110,

Descriptive Physics. Laboratory exercises will be used to explore the fundamental laws and applications of mechanics, heat, electricity, optics, atomic and nuclear physics.

Schedule Description

SECTION D

Condition on Enrollment

1a. Prerequisite(s)

- PHYS 110 with a minimum grade of C or better

1b. Corequisite(s)

- PHYS 110 or

1c. Recommended: *None*

1d. Limitation on Enrollment: *None*

SECTION E

Course Outline Information

1. Student Learning Outcomes:

A. Laboratory skills. Students will learn to collect and interpret scientific data through the completion of basic physics experiments. Lab topics include mechanics, heat, electricity, sound, optics, atomic and nuclear physics (as covered in the corresponding lecture class PHYS 110).

2. Course Objectives: Upon completion of this course, the student will be able to:

A. Determine the slope of a straight line graph.
B. Distinguish between the concepts of velocity and acceleration.
C. Analyze a simple machine in terms of its mechanical advantage and efficiency.
D. Examine momentum and energy conservation in a simple collision.
E. Recognize the relationship between pressure and volume in a Boyle's Law experiment.
F. Analyze a one-dimensional standing wave in terms of transmitted and reflected waves.
G. Know how to use a multimeter to measure voltage, current and resistance.
H. Explain the creation of an image by a converging lens.
I. Analyze the diffraction grating spectrometer in the measurement of a wavelength.
J. Evaluate the light intensity transmitted by a set of crossed polarizers.
K.

3. Course Content

A. Introduction
    a. Laboratory Practices and Graphing
    b. Computer Usage
    c. Measurements
B. Mechanics
    a. Linear Motion
    b. Acceleration of Gravity
    c. Torques/Leverage/Simple Machines
C. Momentum and/or Energy Conservation
D. Properties of Matter
E. Pressure/Force/Boyles's Law
F. Hooke's Law
G. Archimedes' Principle
H. Heat
    a. Heat Transfer and/or Thermal Expansion

b. Specific Heats

I. Vibrations and Waves
   a. Sound
   b. Resonance

J. Electricity and Magnetism
   a. Electrostatics and/or Magnetic Fields
   b. Electric Current and/or Ohm's Law
   c. Multimeters and/or Oscilloscope

K. Light
   a. Lenses/Images
   b. Diffraction Grating
   c. Polarization
   d.

4. Methods of Instruction:

Experiments:

Lab:

5. Methods of Evaluation: Describe the general types of evaluations for this course and provide at least two, specific examples.

Typical classroom assessment techniques

Lab Activities --

Additional assessment information:

Satisfactory completion of laboratory experiments and laboratory reports is required.

Letter Grade or P/NP

6. Assignments: State the general types of assignments for this course under the following categories and provide at least two specific examples for each section.

A. Reading Assignments
   Each laboratory has background reading and instructions for the experiment.
   Examples:
   1. Read the background reading for the Measurement, Error, and Uncertainty lab.
   2. Read the instructions for the Acceleration of Gravity lab.

B. Writing Assignments
   Written laboratory reports will include: recorded data, graphs, simple data analysis, and discussion of results.
   Examples:
   1. Describe the difference between accuracy and precision.
   2. If the sampling rate was doubled, would this change your measurement of g?

C. Other Assignments
   -

7. Required Materials

A. EXAMPLES of typical college-level textbooks (for degree-applicable courses) or other print materials.

Book #1:

Author:	Hewitt, Paul G
Title:	Laboratory Manual: Activities, Experiments, Demonstrations & Tech Labs for Conceptual Physics
Publisher:	Pearson
Date of Publication:	2019

Edition:	12th
Book #2:	
Author:	Robinson, Paul
Title:	Conceptual Physics (Laboratory Manual)
Publisher:	Prentice Hall
Date of Publication:	2001
Edition:	

B. Other required materials/supplies.