

PHYS-111: DESCRIPTIVE PHYSICS LABORATORY

Effective Term

Fall 2018

BOT Approval

05/01/2000

SECTION A - Course Data Elements
CB04 Credit Status

Credit - Degree Applicable

Discipline

Minimum Qualifications	And/Or
Physics/Astronomy (Master's Degree)	

Subject Code

PHYS - Physics

Course Number

111

Department

Physics

Division

Science and Engineering (SE)

Full Course Title

Descriptive Physics Laboratory

Short Title

Descriptive Physics Laboratory

CB03 TOP Code

1902.00 - Physics, General

CB08 Basic Skills Status

NBS - Not Basic Skills

CB09 SAM Code

E - Non-Occupational

Rationale

No updates since 1986.

SECTION B - Course Description
Catalog Course 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.

SECTION C - Conditions on Enrollment
Open Entry/Open Exit

No

Repeatability

Not Repeatable

Grading Options

Letter Grade or Pass/No Pass

Allow Audit

Yes

Requisites**Corequisite(s)**

Concurrent enrollment in or successful completion of PHYS-110 with a minimum grade of C.

Requisite Justification**Requisite Description**

Course in a Sequence

Subject

PHYS

Course #

110

Level of Scrutiny

Content Review

Upon entering this course, students should be able to:

- 1) Distinguish between the concepts of displacement, velocity and acceleration.
- 2) Understand Newton's Three Laws of Motion.
- 3) Differentiate between work, energy and heat.
- 4) Explain the relationship between pressure, height and density of a fluid.
- 5) Define the units of electricity - the ampere, volt, watt, and ohm.
- 6) Compare and contrast the properties of converging and diverging lenses.
- 7) Understand the wave nature of polarized light.

SECTION D - Course Standards**Is this course variable unit?**

No

Units

1.00

Lab Hours

54.00

Outside of Class Hours

0

Total Contact Hours

54

Total Student Hours

54

Distance Education Approval**Is this course offered through Distance Education?**

Yes

Online Delivery Methods

DE Modalities	Permanent or Emergency Only?
Entirely Online	Permanent
Hybrid	Permanent
Online with Proctored Exams	Permanent

SECTION E - Course Content**Student Learning Outcomes**

Upon satisfactory completion of the course, students will be able to:	
1.	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).

Course Objectives

Upon satisfactory completion of the course, students will be able to:	
1.	Determine the slope of a straight-line graph.
2.	Distinguish between the concepts of velocity and acceleration.
3.	Analyze a simple machine in terms of its mechanical advantage and efficiency.
4.	Examine momentum and energy conservation in a simple collision.
5.	Recognize the relationship between pressure and volume in a Boyle's Law experiment.
6.	Analyze a one-dimensional standing wave in terms of transmitted and reflected waves.
7.	Know how to use a multimeter to measure voltage, current and resistance.
8.	Explain the creation of an image by a converging lens.
9.	Analyze the diffraction grating spectrometer in the measurement of a wavelength.
10.	Evaluate the light intensity transmitted by a set of crossed polarizers.

Course Content

1. Introduction
 - a. Laboratory Practices and Graphing
 - b. Computer Usage
 - c. Measurements
2. Mechanics
 - a. Linear Motion
 - b. Acceleration of Gravity
 - c. Torques/Leverage/Simple Machines
3. Momentum and/or Energy Conservation
4. Properties of Matter
5. Pressure/Force/Boyles's Law
6. Hooke's Law
7. Archimedes' Principle
8. Heat
 - a. Heat Transfer and/or Thermal Expansion
 - b. Specific Heats
9. Vibrations and Waves
 - a. Sound
 - b. Resonance
10. Electricity and Magnetism
 - a. Electrostatics and/or Magnetic Fields
 - b. Electric Current and/or Ohm's Law
 - c. Multimeters and/or Oscilloscope
11. Light
 - a. Lenses/Images
 - b. Diffraction Grating
 - c. Polarization

Methods of Instruction

Methods of Instruction

Types	Examples of learning activities
Experiments	
Lab	

Online Adaptation

Types	Examples of learning activities
Activity	
Directed Study	
Discussion	
Group Work	
Lecture	

Instructor-Initiated Online Contact Types

Announcements/Bulletin Boards
 Chat Rooms
 Discussion Boards
 E-mail Communication
 Video or Teleconferencing

Student-Initiated Online Contact Types

Chat Rooms
 Discussions
 Group Work

Course design is accessible

Yes

Methods of Evaluation

Methods of Evaluation

Types	Examples of classroom assessments
Lab Activities	Satisfactory completion of laboratory experiments and laboratory reports is required.

Assignments

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.

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 ?

SECTION F - Textbooks and Instructional Materials

Material Type

Textbook

Author

Hewitt, Paul G

Title

Laboratory Manual: Activities, Experiments, Demonstrations & Tech Labs for Conceptual Physics

Edition/Version

12th

Publisher

2014

Material Type

Textbook

Author

Robinson, Paul

Title

Conceptual Physics (Laboratory Manual)

Publisher

Prentice Hall

Year

2001

SECTION G - Diversity, Equity and Inclusivity**Course Codes (Admin Only)****CB00 State ID**

CCC000091063

CB10 Cooperative Work Experience Status

N - Is Not Part of a Cooperative Work Experience Education Program

CB11 Course Classification Status

Y - Credit Course

CB13 Special Class Status

N - The Course is Not an Approved Special Class

CB23 Funding Agency Category

Y - Not Applicable (Funding Not Used)

CB24 Program Course Status

Program Applicable

Allow Pass/No Pass

Yes

Only Pass/No Pass

No