

PHYS180

Course Summary

Course : PHYS180 **Title :** Introduction to Physics
Length of Course : 8 **Faculty :**
Prerequisites : N/A **Credit Hours :** 3

Description

Course Description:

This course offers an introduction to classical physics for non-scientists. Students will learn to apply Newtonian principles to the fundamental topics of motion, gravitation, momentum, work and energy, heat, wave behavior, sound and light, electricity and magnetism. Basic algebra is used to demonstrate how mathematics can describe and predict the real-world behavior of objects, from electrons to planets. Students will be expected to relate physics principles to their daily lives. Students will discuss the process of the scientific method and also demonstrate science information literacy skills through source selection and creation of a narrated presentation.

Objectives

The successful student will fulfill the following learning objectives:

Distinguish between Science and Pseudoscience.

Calculate the position, velocity and acceleration of macroscopic objects moving in one dimension.

- Solve dynamics problems applying Newton's laws of motion.
 - Solve mechanics problems applying the principles of conservation of linear momentum and energy.
 - Solve thermodynamics problems applying the principle of conservation of energy.
 - Explain how waves transfer energy without transferring matter.
 - Describe how waves are reflected and refracted at boundaries between media.
 - Solve simple problems in Electricity and Electromagnetism. Explain the dual nature of light.
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Outline

Week 1: The Nature of Science

Learning Outcomes

Distinguish between science and pseudoscience.

Required Readings

OpenStax College Physics Chapter 1.1-1.4 and pages 391-393

Week 1 Lesson

Week 1 Lab Lesson

Assignments

Week 1 Discussion

Academic Honor Code Quiz

Week 1 Quiz

Week 2: Motion

Learning Outcomes

Calculate the position, velocity and acceleration of macroscopic objects moving in one dimension. Solve dynamics problems applying Newton's laws of motion. Solve mechanics problems applying the principle of conservation of linear momentum.

Required Readings

OpenStax College Physics Chapter 2.1-2.8, 4.1-4.8, 8.1, 8.3-8.6

Week 2 Lesson

Week 2 Lab Lesson

Assignments

Week 2 Discussion

Week 2 Quiz

Week 3: Energy

Learning Outcomes

Solve mechanics problems applying the principle of conservation of energy.

Required Readings

OpenStax College Physics Chapter 7.1-7.9

Week 3 Lesson

Week 3 Lab Lesson

Assignments

Week 3 Discussion

Week 3 Quiz

Assignment 1

Week 4: Heat and Temperature

Learning Outcomes

Solve thermodynamics problems applying the principle of conservation of energy.

Required Readings

OpenStax College Physics Chapter 14.1-14.7, 15.1-15.7

Week 4 Lesson

Week 4 Lab Lesson

Assignments

Week 4 Discussion

Week 4 Quiz

Week 5: Wave Motions and Sound

Learning Outcomes

Explain how waves transfer energy without transferring matter.

Required Readings

OpenStax College Physics, 16.1-16.11, 17.1-17.5

Week 5 Lesson

Week 5 Lab Lesson

Assignments

Week 5 Discussion

Week 5 Quiz

Assignment 2

Week 6: Electricity

Learning Outcomes

Solve simple problems in Electricity and Electromagnetism.

Required Readings

OpenStax College Physics Chapter 18.1-18.8, 20.1-20.7

Week 6 Lesson

Week 6 Lab Lesson

Assignments

Week 6 Discussion

Week 6 Quiz

Week 7: Light

Learning Outcomes

Describe how waves are reflected and refracted at boundaries between media.

Required Readings

OpenStax College Physics Chapter 25.1-25.4, 27.1-27.9.

Week 7 Lesson

Week 7 Lab Lesson

Assignments

Week 7 Discussion

Week 7 Quiz

Assignment 3

Week 8: Introduction to Modern Physics

Learning Outcomes

Explain the dual nature of light.

Required Readings

OpenStax College Physics Chapter 28.1-28.6, 29.1-29.8

Week 8 Lesson

Week 8 Lab Lesson

Assignments

Week 8 Discussion - Final Presentation

Week 8 Quiz

Evaluation

Grading:

Name	Grade %
Discussions	16.00 %

Week 1: Introduction and Course Project	2.00 %
Week 2: Finding Reliable Scientific Information On The Web	2.00 %
Week 3: Perpetuum mobile	2.00 %
Week 4: The Nature of Matter.	2.00 %
Week 5: Tzunami: the killer wave.	2.00 %
Week 6: Nikola Tesla vs. Thomas Edison	2.00 %
Week 7: The invisible world	2.00 %
Week 8: Final Presentation and Course Wrap Up	2.00 %

Quizzes	56.00 %
Week 4 Quiz	8.00 %
Week 1 Quiz	8.00 %
Week 2 Quiz	8.00 %
Week 3 Quiz	8.00 %
Week 5 Quiz	8.00 %
Week 6 Quiz	8.00 %
Week 7 Quiz	8.00 %
Week 8 Quiz	8.00 %
Course Project: Prep	14.00 %

Assignment 1 - Annotated Bibliography

7.00 %

Materials

Book Title: Various resources from the APUS Library & the Open Web are used. Please visit [eReserve](#) to locate the course.* **Author:**

Publication Info:

ISBN: ERESERVE NOTE

Book Title: College Physics - e-book available online, link provided in the classroom Content section

Author: No Author Specified

Publication Info: OpenStax **ISBN:** N/A

Course Guidelines

Citation and Reference Style

- Attention Please: Students will follow the APA Format as the sole citation and reference style used in written work submitted as part of coursework to the University. Assignments completed in a narrative essay or composition format must follow the citation style cited in the APA Format.

Tutoring

- [Tutor.com](#) offers online homework help and learning resources by connecting students to certified tutors for one-on-one help. AMU and APU students are eligible for 10 free hours* of tutoring provided by APUS. Tutors are available 24/7 unless otherwise noted. Tutor.com also has a SkillCenter Resource Library offering educational resources, worksheets, videos, websites and career help. Accessing these resources does not count against tutoring hours and is also available 24/7. Please visit the APUS Library and search for 'Tutor' to create an account.

Late Work

The University encourages all work to be completed according to the course schedule. The University Late Work Policy can be found in the Student Handbook [here](#).

Turn It In

- Faculty may require assignments be submitted to Turnitin.com. Turnitin.com will analyze a paper and report instances of potential plagiarism for the student to edit before submitting it for a grade. In some cases professors may require students to use Turnitin.com. This is automatically processed through the Assignments area of the course.

Academic Dishonesty

- Academic Dishonesty incorporates more than plagiarism, which is using the work of others without

citation. Academic dishonesty includes any use of content purchased or retrieved from web services such as CourseHero.com. Additionally, allowing your work to be placed on such web services is academic dishonesty, as it is enabling the dishonesty of others. The copy and pasting of content from any web page, without citation as a direct quote, is academic dishonesty. When in doubt, do not copy/paste, and always cite.

Submission Guidelines

- Some assignments may have very specific requirements for formatting (such as font, margins, etc) and submission file type (such as .docx, .pdf, etc) See the assignment instructions for details. In general, standard file types such as those associated with Microsoft Office are preferred, unless otherwise specified.
- [APUS offers students free access to the Microsoft Office Suite.](#)

Disclaimer Statement

- Course content may vary from the outline to meet the needs of this particular group.

Communicating on the Discussion

- Discussions are the heart of the interaction in this course. The more engaged and lively the exchanges, the more interesting and fun the course will be. Only substantive comments will receive credit. Although there is a final posting time after which the instructor will grade comments, it is not sufficient to wait until the last day to contribute your comments/questions on the discussion. The purpose of the discussions is to actively participate in an on-going discussion about the assigned content.
- “Substantive” means comments that contribute something new and hopefully important to the discussion. Thus a message that simply says “I agree” is not substantive. A substantive comment contributes a new idea or perspective, a good follow-up question to a point made, offers a response to a question, provides an example or illustration of a key point, points out an inconsistency in an argument, etc.
- As a class, if we run into conflicting view points, we must respect each individual's own opinion. Hateful and hurtful comments towards other individuals, students, groups, peoples, and/or societies will not be tolerated.

University Policies

[Student Handbook](#)

- [Drop/Withdrawal policy](#)
- [Extension Requests](#)
- [Academic Probation](#)
- [Appeals](#)
- [Disability Accommodations](#)

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