

Physics (PHYS) 210

Conceptual Physics (Revision 2)

Delivery mode: [Individualized study online](#)  with [eText](#) 

Credits: 3



Area of study: Science

Prerequisites: None

Precluded: None

Challenge: PHYS 210 has a challenge for credit option.

Faculty: [Faculty of Science and Technology](#) 

Status: Replaced with new revision, see the [course listing](#)  for the current revision 

Overview

PHYS 210 is an introductory post-secondary physics course that follows a non-mathematical approach and focuses on understanding central concepts in physics. The course can be taken by students in liberal arts, education, business, medical services, and other disciplines in which a basic understanding of physics is required. It can also be used as a bridge course to science and engineering for students without high school physics. The emphasis of this course is on three main topics: Mechanics, Properties of Matter and Heat.

Outline

PHYS 210 consists of the following eighteen units:

- Unit 1: Introduction
- Unit 2: Newton's First Law of Motion - Inertia
- Unit 3: Linear Motion
- Unit 4: Newton's Second Law of Motion
- Unit 5: Newton's Third Law of Motion
- Unit 6: Momentum
- Unit 7: Energy
- Unit 8: Rotational Motion
- Unit 9: Gravity
- Unit 10: Projectile and Satellite Motion
- Unit 11: The Atomic Nature of Matter
- Unit 12: Solids
- Unit 13: Liquids
- Unit 14: Gases
- Unit 15: Temperature, Heat, and Expansion
- Unit 16: Heat Transfer

- Unit 17: Change of Phase
- Unit 18: Thermodynamics

Learning outcomes


Upon successful completion of this course, you should be able to

- explain the differences between science and art and discuss the main features of scientific methods.
- define and explain the relationships between time, displacement, velocity and constant acceleration for motions in one and two dimensions, including uniform rotation.
- outline Newton's three laws of motion and discuss the dynamics of moving objects in the presence of resistive forces.
- discuss the principles of conservation of energy, conservation of linear momentum, and conservation of angular momentum, and give examples of their applications.
- recall Newton's law of universal gravitation and use it to explain ocean tides and satellite motion.
- discuss the atomic and molecular nature of matter and explain the periodic table of elements.
- define the solid, liquid and gaseous states of matter and discuss relevant concepts such as elasticity, buoyancy, capillarity and the Bernoulli's principle.
- explain the notions of temperature, heat, specific heat capacity, thermal expansion, and heat transfer.
- describe the different types of phase transformations and explain relevant phenomena such as the formation of clouds.
- state the first and second laws of thermodynamics and explain the basic idea behind the heat engine.

Evaluation


Your final grade in PHYS 210 is based on the grades you achieve in two online multiple-choice quizzes, four tutor-marked exercises, and a final examination. You must achieve at least fifty per cent on the final examination, and an overall course grade of at least fifty per cent to pass the course. The following chart summarizes the evaluation activities, and the credit weight of each.

Activity	Weight
Quiz 1	15%
Quiz 2	15%
Assignment 1	5%
Assignment 2	5%
Assignment 3	5%
Assignment 4 (Essay)	15%
Final Exam	40%
Total	100%

The **final examination** for this course must be taken online with an AU-approved exam invigilator at an approved invigilation centre. It is your responsibility to ensure your chosen invigilation centre can accommodate online exams. For a list of invigilators who can accommodate online exams, visit the [Exam Invigilation Network](#) .

To learn more about assignments and examinations, please refer to Athabasca University's [online Calendar](#) .

Materials

Hewitt, Paul G. *Conceptual Physics*, 11th ed. Petersburg, FL: Pearson Addison-Wesley, 2010.  (eText)

eText

Registration in this course includes an electronic textbook. For more information on **electronic textbooks** [↗](#), please refer to our **eText Initiative site** [↗](#).

Other Resources

All other learning resources will be available online.

Important links

- › [Academic advising](#) [↗](#)
- › [Program planning](#) [↗](#)
- › [Request assistance](#) [↗](#)
- › [Support services](#) [↗](#)

Athabasca University reserves the right to amend course outlines occasionally and without notice. Courses offered by other delivery methods may vary from their individualized study counterparts.

Opened in Revision 2, February 12, 2014

Updated July 8, 2022, by Student & Academic Services

View [previous revision](#) [↗](#)