Physics (PHYS) 200

Introductory Physics I (Revision 7)

Status:	Replaced with new revision, see the **course listing** for the current revision
Delivery mode:	**Individualized study online** with **eText** , and a **Home Lab** . PHYS 200 has a **lab exemption** This course is charged a **lab fee**
Credits:	3
Area of study:	Science
Prerequisites:	None
Precluded:	**PHYS 204**, PHYS 274
Challenge:	PHYS 200 is not available for challenge.
Faculty:	**Faculty of Science and Technology**
Notes:	**Detailed Syllabus and Assessment** (PDF) If you are interested in a university physics course at a more introductory level and with

no lab requirement, you may want to consider **PHYS 210**.

Overview

PHYS 200 is the first course in algebra-based physics, which provides an introduction to classical mechanics and includes a hands-on laboratory component. In addition to the eTextbook, the course material includes a well-written *Study Guide* designed for independent learning. PHYS 200 combined with either PHYS 201 or PHYS 202 is the equivalent of one year of introductory physics.

Outline

PHYS 200 comprises the following ten units.

- Unit 1: Introduction: The Nature of Science and Physics
- Unit 2: Kinematics
- Unit 3: Two-Dimensional Kinematics
- Unit 4: Dynamics: Force and Newton's Laws of Motion
- Unit 5: Further Applications of Newton's Laws: Friction, Drag, and Elasticity
- Unit 6: Uniform Circular Motion and Gravitation
- Unit 7: Work, Energy, and Energy Resources
- Unit 8: Linear Momentum and Collisions
- Unit 9: Statics and Torque
- Unit 10: Rotational Motion and Angular Momentum

Lab Component

PHYS 200 includes a compulsory lab component, which comprises six hands-on experiments performed in a place of the student's choice. Procedures involves video capture and analysis of moving objects and requires some common household items, such as the video camera in a smartphone. Assessment is based on a written lab report. The PHYS 200 course material explains the following experiments.

- Experiment 1: Graphical Analysis
- Experiment 2: Kinematics in One Dimension
- Experiment 3: Projectile Motion
- Experiment 4: Hooke's Law
- Experiment 5: Collision in Two Dimensions
- Experiment 6: Rolling Motion

Students may qualify for partial or full **transfer of lab credit** obtained for equivalent lab work at another institution.

Learning outcomes

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

- convert between different units and express a physical quantity in scientific notation using the appropriate number of significant digits.
- explain the relationships between time, displacement, velocity and constant acceleration, and use algebra to solve kinematic problems in one or two dimensions.
- analyze and solve dynamic problems using vector addition, Newton's three laws of motion, and resistive forces.
- analyze and solve work-, energy- and power-related problems using appropriate formulas and the conservation of energy principle.
- outline the conservation of linear momentum principle and apply it to solve problems that involve one- and two-dimensional (elastic and inelastic) collisions.
- define the concepts of torque and centre of mass and solve problems that involve static equilibrium of extended bodies.

- analyze and solve problems that involve the kinematics and dynamics of rotational motion and the conservation of angular momentum principle.
- describe Hooke's law and the elastic properties of solids and apply formulas for calculating Young's modulus, shear modulus, and bulk modulus.
- recall Newton's law of universal gravitation and apply it to solve problems involving the force of gravity and satellite motion.
- demonstrate skills related to performing simple experiments in classical mechanics, including experimental setup, data acquisition, data analysis, and communication of scientific results.

Evaluation

Final grade is based on marks achieved on two assignments, six lab reports, and two examinations. To receive credit, the student must achieve a minimum of 50 percent on the final examination and on the lab component, and a course composite grade of at least "D" (50 percent). The following chart describes the credit weight associated with each course requirement.

Activity	**Weight**
Assignments	20%
Lab Reports	20%
Midterm Online Exam	20%
Final Online Exam	40%
Total	**100%**

The **midterm and final examinations** for this course must be requested in advance and written under the supervision of an AU-approved exam invigilator. Invigilators include either ProctorU or an approved in-person invigilation centre that can accommodate online exams. Students are responsible for payment of any invigilation fees. Information on exam request

deadlines, invigilators, and other exam-related questions, can be found at the **Exams and grades** section of the Calendar.

To learn more about assignments and examinations, please refer to Athabasca University's **online Calendar** .

Materials

This course either does not have a course package or the textbooks are open-source material and available to students at no cost. This course has a **Course Administration and Technology Fee** , but students are not charged the Course Materials Fee.

OpenStax College, ***College Physics***. OpenStax College. 21 June 2012. 
(eText)

eText

Registration in this course includes an electronic textbook. For more information on **electronic textbooks** , please refer to our **eText Initiative site** .

PHYS 200 is based on the OpenStax College Physics eTextbook, which is open source material licensed under the **Creative Commons Attribution 3.0 Unported** license.

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.

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View **previous revision**