

**CAREER
PATHS**

Science

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Express Publishing

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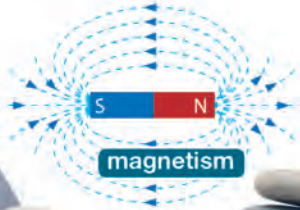
Get ready!

1 Before you read the passage, talk about these questions.

- 1 How are physics and electromagnetism related?
- 2 What are some examples of physics in everyday life?



motion



magnetism



equilibrium

COURSE DESCRIPTION

Physics 101: Intro to Physics

This course is a combined lecture and lab series. It's a survey of classical and modern physics, and the fundamental **laws** of nature. A standard physics course involves the movement of matter through space and time. We'll cover the traditional topics as well as related concepts. We'll focus on elements of physics in everyday life, such as **gravity** and energy. Students must complete the lecture series before beginning any labs. As an introductory course, there are no prerequisites to take this class. However, knowledge of secondary-level math and science is essential.

We'll briefly discuss the four laws of **thermodynamics**. This will prepare students for more detailed discussion in upper-level courses. In labs, we'll examine how these relate to **equilibrium** and other scientific phenomena.

In the lab component, students examine **motion** and its operation in nature. We'll identify **constants**, opposing forces, and rates of change. We'll address this with an emphasis on **momentum** and **conservation** of energy. Students interested in **electromagnetism** should pay close attention to the final lab. There, we'll create models demonstrating **magnetism** and motion. The lab instructor will demonstrate the effects of **waves** in self-contained environments. Students will see how the **vibrations** are practically visible.

This course is a prerequisite for all upper-level physics courses.

Reading

2 Read the course description. Then, choose the correct answers.

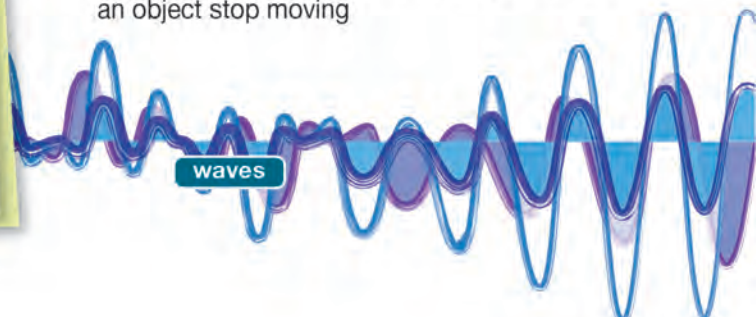
- 1 What do students need to know before taking the class?
 - A theories of thermodynamics
 - B general physics concepts
 - C secondary-level math and science
 - D upper-level chemistry
- 2 Which concept is addressed in the labs on equilibrium?
 - A thermodynamics
 - B electromagnetism
 - C conservation of energy
 - D momentum
- 3 What is true about the lab component?
 - A It requires students to attend the lectures first.
 - B It applies theories from advanced physics.
 - C It focuses on the ideas of gravity and energy.
 - D It allows students to develop their own experiments.

Vocabulary

3 Match the words (1-6) with the definitions (A-F).

- | | |
|----------------|-----------------------|
| 1 __ law | 4 __ momentum |
| 2 __ wave | 5 __ thermodynamics |
| 3 __ vibration | 6 __ electromagnetism |

- A a branch of science that studies heat and other forms of energy
- B an explanation of a natural process that is always true
- C the interaction between electrical currents and magnetic fields
- D a disturbance that moves through a substance
- E a repeated movement in a substance or field of energy
- F a measurement of the force required to make an object stop moving



waves



gravity

- 4 Fill in the blanks with the correct words from the word bank.

Word BANK

motion **constant**
equilibrium **conservation**
magnetism **gravity**

- The experiment included a set of variables and one _____.
- The students applied equal force to each side of the table in order to demonstrate _____.
- The instructor used an apple dropping to the ground to demonstrate _____.
- The physics class used movement of toy cars to analyze _____.
- The section about _____ of energy covered ways to store it for future use.
- The positive attraction of the two objects was an example of _____.

- 5 Listen and read the course description again. Why is the conservation of energy important?

Listening

- 6 Listen to a conversation between a TA and a student. Mark the following statements as true (T) or false (F).

- ___ The man is unfamiliar with electromagnetism.
- ___ The woman offers the man her lecture notes.
- ___ The course primarily focuses on the laws of thermodynamics.

- 7 Listen again and complete the conversation.

TA: You look a bit worried. 1 _____ ?
Student: I'm concerned that I'm unprepared for this course.
TA: Why is that?
Student: The concepts the professor discussed today were completely 2 _____ .
TA: I see. Is it physics in general 3 _____ ?
Student: Thermodynamics and electromagnetism, specifically. I think I might be in the wrong class.
TA: Don't worry. You're not expected to be familiar with those concepts initially. Also, we'll only 4 _____ in this class.
Student: How will I get through those sections, though?
TA: If you can understand equilibrium and motion, 5 _____ .
Student: That doesn't 6 _____ . I studied those in high school.

Speaking

- 8 With a partner, act out the roles below based on Task 7. Then, switch roles.

USE LANGUAGE SUCH AS:

*Why is that? / I don't really understand ...
 In our class ...*

Student A: You are a TA. Talk to Student B about:

- topics in a physics class
- concepts he or she is having trouble with
- how his or her current knowledge applies

Student B: You are a student. Talk to Student A about topics in a physics class.

Writing

- 9 Use the course description and the conversation from Task 8 to write an email to a TA. Include: course concepts, what you're familiar with, and what you'll need help with.

