



This course supports the objective and performance assessments for Introduction to Physics. The course covers 6 competencies and represents 4 competency units.

## Introduction

This course provides students with a comprehensive overview of the basic principles and unifying concepts of physics.

Instructional content is enhanced by interactives and laboratory activities that will provide hands on knowledge and experience. Course materials focus on why science is important to everyday life, practical application, and conceptual understanding.

Watch the following video for an introduction to this course:

*Note: To download this video, right-click the following link and choose "Save as...":* [download video](#).

## Competencies

This course provides guidance to help you demonstrate the following 6 competencies:

- **Competency 1000.1.01: Nature and Process of Science**  
The student will be able to analyze the nature and process of science.
- **Competency 1000.1.02: Classical Physics**  
The graduate analyzes classical physics concepts to understand the world around them.
- **Competency 1000.1.03: Electricity and Magnetism**  
The graduate applies electricity and magnetism concepts to understand the world around them.
- **Competency 1000.1.04: Wave Physics**  
The graduate applies wave physics concepts to understand the world around them.
- **Competency 1000.1.05: Thermodynamics**  
The graduate analyzes principles of thermodynamics
- **Competency 1000.1.06: Modern Physics**  
The graduate analyzes modern physics concepts.

## Cohorts

Currently, only one cohort is available for Introduction to Physics, the self-paced, guided cohort.

## Learning Materials

The information in this section will help you succeed in this course.

If you're unsure about your skill level with math, it can be very helpful to get an objective evaluation. Follow the link below to EdReady, and then follow these steps to access "Physics Math Prep":



1. Select this [link to EdReady](#)
2. Select the button that says “Enter As Guest,” and then select “Enter” again
3. In the next dialog box, select “Get Started”
4. Now find “General Education Course Prep” and click on “Add to your goals” below the image
5. Scroll down to “Physics Math Prep” and click the “Start assessment” button
6. Follow the prompts to answer the questions (you may use a calculator)

This short set of questions takes about 30-60 minutes. The results tell you what material you’ve mastered, what needs review, and what you should study and provides links to study resources.

Use the [Course Instructor Videos](#) and [e-text](#) within VitalSource to answer the [Study Guide questions](#) in your own words. (The foregoing link takes you to a complete set of study questions for all the topics in this course.) The activities in this course will detail the videos, chapters, and practice problems to engage with for each topic area.

You must [enroll for Mastering Physics](#). If you do not use this resource, you will not be prepared for the math problems on the assessment.

For help with physics problem solving, you are also encouraged to utilize our list of [physics equations](#) and to read through our series of [example problems](#) with detailed and step-by-step solutions.

You may want to sign up for a cohort on the Explore Cohort Offerings page.

The course instructors have provided example tasks to help you complete your assessments.

### **Learning Resource**

The information in this section will help you navigate your learning resources and successfully complete the course.

#### **Mastering Physics**

The [Mastering Physics](#) web-based resource from Pearson includes quizzes, tutorials, and simulations that align to the e-text used in this course. You will not read the textbook inside the Mastering Physics resource (see note below).

To enroll in Mastering Physics, use [the instructions provided by course instructors](#).

Please be aware that when you click on an assignment in Mastering Physics, the exercise will open in a separate popup window. This window can sometimes be hidden behind other windows, or may be blocked by popup blocking software. Check your open browser windows and disable your popup blocking software if you're unable to find the exercise window.

Remember, course instructors are always happy to help you troubleshoot if you cannot locate the exercise window.



**Note:** You will see a button labeled "e-Text" on the Mastering Physics website. This button does not provide access to the course textbook. You have free access to the course textbook, *Conceptual Physics*, by clicking on any of the textbook links within the course.

## Conceptual Physics Textbook

The textbook [Conceptual Physics](#) is available to you as an e-text within this course. You will be directly linked to the specific readings required within the activities.

*Note: These e-texts are available to you as part of your program tuition and fees, but you may purchase a hard copy at your own expense through VitalSource or a retailer of your choice. If you choose to do so, please use the ISBN listed to ensure that you receive the correct edition. The following sites provide instruction on how to create a VitalSource account, use features such as downloading your e-texts for offline use, and purchase a print-on-demand option, if available.*

- [VitalSource Navigational Video](#)
- [Print-On-Demand Option](#)

**Do not read the textbook cover to cover.** It contains information that is not on the assessment and also practice exercises that are beyond what you need to know.

## Calculators and Whiteboards

Refer to the [WGU Objective Assessment Policies](#) in the WGU Student Handbook for details regarding calculators and whiteboards that are acceptable on WGU exams.

Please view the following video for more information on how to use a whiteboard:

*Note: To download this video, right-click the following link and choose "Save as...":* [download video](#).

## Live Session

Cohort live sessions may be held periodically, including Q & A sessions. Check "Announcements" and "Course Tips" sections of this course for the most current information and times.

## [C164 Live Events](#)

Some students are unable to see the embedded calendar. Click on the calendar title (C164 Live Events) to open the calendar in a new window.

## Pacing Guide

The pacing guide suggests a weekly structure to pace your completion of learning activities. It is provided as a suggestion and does not represent a mandatory schedule. Follow the pacing guide carefully to complete the course in the suggested timeframe.

- Week 1



- Download the [Study Guide questions](#) (a complete set of study questions for all the topics)
- Nature and Process of Science
- Week 2
  - Classical Physics
- Week 3
  - Electricity and Magnetism
- Week 4
  - Wave Physics
- Week 5
  - Thermodynamics
- Week 6
  - Modern Physics
- Week 7
  - Pre-assessment, coaching report, and objective assessment

## Course Work

Complete the activities in this section to gain competence.

### Nature and Process of Science

These activities will guide your understanding of what science is, how science works, and why studying science is important.

#### Topic 1 Nature of Science

1. Watch [Getting Started \(9:43\)](#)
2. Watch [Nature of Science \(18:21\)](#)
3. Read these sections in [chapter 1](#)
  - Scientific Methods
  - The Scientific Attitude
4. Practice problems in "[Introduction to Mastering Physics](#)"
5. Answer the [Nature of Science study questions](#)

#### Topic 2 Processes of Science

1. Watch [Processes of Science Part 1 \(14:49\)](#)
2. Watch [Processes of Science Part 2 \(9:47\)](#)
3. Watch [Calculators and Scientific Notation \(8:06\)](#)
4. Read [Appendix A](#)
5. Practice problems in [Mastering Physics](#)
6. Answer the [Processes of Science study questions](#)

### Classical Physics

These materials will help you understand about the fundamental aspects of classical physics that govern much of the everyday world we live in and interact with.



## Topic 1 Forces and Motion

1. Watch [Forces and Vectors \(8:23\)](#)
2. Watch [Newton's First Law \(6:01\)](#)
3. Watch [Newton's Second and Third Laws \(13:54\)](#)
4. Watch [Linear Motion \(11:40\)](#)
5. Read all sections of [chapter 2](#)
6. Read these sections of [chapter 3](#)
  - o Speed Section
  - o Velocity Section
  - o Acceleration through Free Fall: How Far
7. Read all sections of [chapter 4](#)
8. Read these sections of [chapter 5](#)
  - o Forces and Interactions
  - o Newton's Third Law of Motion
9. Practice problems in [Mastering Physics](#)
10. Answer the [Forces and Motion study questions](#)

## Topic 2 Energy and Momentum

1. Watch [Energy \(18:12\)](#)
2. Watch [Momentum \(8:10\)](#)
3. Watch [Momentum Problem Solving \(13:59\)](#)
4. Watch [Introduction to Conservation of Momentum \(13:09\)](#)
5. Watch [Conservation of Momentum Problem Solving Part 1 \(5:12\)](#)
6. Watch [Conservation of Momentum Problem Solving Part 2 \(4:17\)](#)
7. Review this section of [chapter 2](#)
  - o Summary of terms
8. Read these sections of [chapter 6](#)
  - o "Momentum" through "Conservation of Momentum"
  - o "Collisions" through "More Complicated Collisions"
9. Read these sections of [chapter 7](#)
  - o "Power" through "Conservation of Energy"
10. Watch [Conservation of Energy Problem Solving Part 1 \(6:25\)](#)
11. Watch [Conservation of Energy Problem Solving Part 2 \(6:50\)](#)
12. Practice problems in [Mastering Physics](#)
13. Answer the [Energy and Momentum study questions](#)

## Topic 3 Rotational Motion

1. Watch [Rotational Motion \(24:36\)](#)
2. Read these sections of [chapter 8](#)
  - o "Circular Motion" through "Stability"
  - o "Angular Momentum"



3. Practice problems in [Mastering Physics](#)
4. Answer the [Rotational Motion study questions](#)

### Topic 4 Gravity

1. Watch [Gravity \(20:49\)](#)
2. Read these sections of [chapter 9](#)
  - o “The Newtonian Synthesis” through “Gravity and Distance: The Inverse-Square Law”
3. Practice problems in [Mastering Physics](#)
4. Answer the [Gravity study questions](#)

## Electricity and Magnetism

These materials will help you understand what electricity and magnetism are and where these concepts appear in everyday applications.

### Topic 1 Electrostatics

1. Watch [Electric Forces and Fields \(17:56\)](#)
2. Read this section of [chapter 22](#)
  - o “Electrical Forces” through “Electric Energy Storage”
3. Watch [Coulomb's Law Sample Problem 1 \(7:36\)](#)
4. Watch [Coulomb's Law Sample Problem 2 \(6:18\)](#)
5. Practice problems in [Mastering Physics](#)
6. Answer the [Electrostatics study questions](#)

### Topic 2 Electric Currents

1. Watch [Electric Circuits \(11:07\)](#)
2. Watch [Series Circuits Problem Solving \(4:00\)](#)
3. Watch [Parallel Circuits Problem Solving \(7:03\)](#)
4. Read this section of [chapter 22](#)
  - o “Electric Energy Storage”
5. Read these sections of [chapter 23](#)
  - o “Ohm’s Law”
  - o “Direct and Alternating Current”
  - o “Parallel Circuits and Overloading” through “Safety Fuses”
6. Practice problems in [Mastering Physics](#)
7. Answer the [Electric Currents study questions](#)

### Topic 3 Magnetic Forces and Fields

1. Watch [Magnetic Forces and Fields Part 1 \(8:31\)](#)
2. Watch [Magnetic Forces and Fields Part 2 \(13:42\)](#)
3. Read [chapter 24](#) and [chapter 25](#)
4. Practice problems in [Mastering Physics](#)
5. Answer the [Magnetic Forces and Fields study questions](#)

## Wave Physics

These materials will assist you in understanding what waves are and how they interact with matter and with each other.



## Topic 1 Waves and Harmonic Motion

1. Watch [Waves Part I \(9:37\)](#)
2. Read these sections of [chapter 19](#)
  - o “Vibrations and Waves” through “Shock Waves”
3. Practice problems in [Mastering Physics](#)
4. Answer the [Waves and Harmonic Motion study questions](#)

## Topic 2 Sound

1. Watch [Waves Part II \(12:38\)](#)
2. Read these sections of [chapter 20](#)
  - o “Nature of Sound” through “Interference”
3. Practice problems in [Mastering Physics](#)
4. Answer the [Sound study questions](#)

## Topic 3 Electromagnetic Spectrum

1. Watch [Waves Part III \(13:27\)](#)
2. Read these sections of [chapter 26](#)
  - o “Electromagnetic Waves” through “The Electromagnetic Spectrum”
3. Practice problems in [Mastering Physics](#)
4. Answer the [Electromagnetic Spectrum study questions](#)

## Topic 4 Light and Optics

1. Watch [Waves Part IV \(10:43\)](#)
2. Read these sections of [chapter 26](#)
  - o “Transparent Materials” through “Opaque Materials”
3. Read this section of [chapter 27](#)
  - o “Why the Sky Is Blue”
4. Read these sections of [chapter 28](#)
  - o “Reflection” through “Refraction”
  - o “Dispersion” through “Total Internal Reflection”
5. Read these sections of [chapter 29](#)
  - o “Diffraction” through “Superposition and Interference”
  - o “Polarization”
6. Practice problems in [Mastering Physics](#)
7. Answer the [Light and Optics study questions](#)

## Topic 5 Differentiating Light Waves and Sound Waves

1. Review chapters 19, 20, 26, and 28
2. Practice problems in [Mastering Physics](#)
3. Answer the [Differentiating Light Waves and Sound Waves study questions](#)

## Thermodynamics

These materials will assist you in learning the fundamentals of thermodynamics and the factors relating temperature to different forms of energy.

### Topic 1 Temperature and Heat



1. Watch [Temperature and Heat \(16:53\)](#)
2. Read these sections of [chapter 15](#)
  - o “Temperature” through “The High Specific Heat Capacity of Water”
3. Practice problems in [Mastering Physics](#)
4. Answer the [Temperature and Heat study questions](#)

### Topic 2 Laws of Thermodynamics

1. Watch [Laws of Thermodynamics \(15:31\)](#)
2. Read these sections of [chapter 18](#)
  - o “First Law of Thermodynamics”
  - o “Second Law of Thermodynamics” through “Entropy”
3. Practice problems in [Mastering Physics](#)
4. Answer the [Laws of Thermodynamics study questions](#)

## Modern Physics

These materials will help you to learn how classical physics differs from our modern understanding of physics, and includes basic quantum physics principles.

### Topic 1 Quantum Mechanics

1. Watch [Quantum Mechanics \(10:15\)](#)
2. Read these sections of [chapter 31](#)
  - o “Photoelectric Effect” through “Predictability and Chaos”
3. Practice problems in [Mastering Physics](#)
4. Answer the [Quantum Mechanics study questions](#)

### Topic 2 Solid State Physics

1. Watch [Modern Physics: Semiconductors \(10:38\)](#)
2. Watch [Modern Physics: Giant Magnetoresistance \(10:34\)](#)
3. Read these sections of [chapter 11](#)
  - o Characteristics of Atoms
  - o Atomic Imagery
  - o Atomic Structure
  - o The Elements
  - o The Periodic Table
4. Other activities to complete:
  - o [GMR](#)
  - o [How Semiconductors and Transistors Work](#)
  - o [GMR 101](#)
  - o [Advanced GMR](#)
5. Practice problems in [Mastering Physics](#)
6. Answer the [Solid State Physics study questions](#)

## Assessments Prep

Review the information below before taking your assessment.

*Preassessment*





You should plan to pass the preassessment before taking the objective assessment. Consult with your course instructor to determine the most appropriate time for you to take your preassessment. Students with a strong physics background may wish to take the preassessment early to help them identify the specific areas to focus on in their studying. Students without a strong science background are typically more successful if they work through the course content first. The preassessment can then be used to determine readiness for the objective assessment.

After taking the preassessment, studying the areas identified as weaknesses in the coaching report, and taking the preassessment again as necessary, you are ready to schedule and take the objective assessment.

Refer to the "Assessment" tab for access information. Please contact a course instructor if you need additional help.

### *Performance Assessment*

Complete the Introduction to Physics Lab performance assessment and submit in Taskstream.

Competency in this course is evaluated using a Performance Assessment. All performance assessments have an associated rubric that describes expectations of your work. Watch these short, fun videos to learn how to read the task directions and use a rubric effectively to ensure your success.

*Note: To download this video, right-click the following link and choose "Save as...":* [download video](#).

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For details about this performance assessment, see the "Assessment" tab in this course. Your work should meet the minimum requirements set by the scoring rubric. You can also contact a course instructor.

### **Review Task Examples**

- [Task 1 Example](#)
- [Task 2 Example](#)

For additional support in utilizing the materials to address the performance tasks for this course, view the following videos:

- [Task 1: Annotated Timeline](#)
- [Task 2: Overview](#)
- [How to think through an Experiment in Physics](#)



## Policies

Please review these important policies.

### Accessibility Policy

Western Governors University recognizes and fulfills its obligations under the Americans with Disabilities Act of 1990 (ADA), the Rehabilitation Act of 1973 and similar state laws. Western Governors University is committed to provide reasonable accommodation(s) to qualified disabled learners in University programs and activities as is required by applicable law(s). The Office of Student Accessibility Services serves as the principal point of contact for students seeking accommodations and can be contacted at [ADASupport@wgu.edu](mailto:ADASupport@wgu.edu).

### Netiquette

#### Netiquette Guidelines

Online Netiquette: Guidelines for WGU Students These guidelines are a quick reference source for interacting with fellow students, mentors, and WGU staff. While these guidelines adhere to the standards outlined in the WGU Student Handbook, they are not meant as a replacement for the explicit information presented in the handbook.

#### Be professional and respectful:

- Be civil and kind in your interactions with others.
- Respond to important emails sent to you.
- Be cautious when using ALL CAPS (yelling), sarcasm, and humor
- Be cautious when posting content (pictures, comments)
- Avoid forwarding spam or selling anything.
- Keep comments related to the topic.
- Be aware that mentors, students, and others live in different time zones.

#### Be short, concise, and readable:

- Use sans serif fonts (e.g., Arial, Helvetica) with a point size of 12 or higher.
- Use acronyms cautiously. For example, common acronyms such as FAQ and RSVP are fine; however, unknown acronyms like UCET or USOE should be spelled out.

#### Be credible:

- Cite references and sources such as web links, articles, books, etc., when possible.
- Re-read your emails to clarify and ensure it sends the intended "message."

#### Be safe:

- Keep personal information private to avoid identity fraud.
- Keep other's information private (WGU students, companies, etc.)