



This course supports the assessment for Physics: Content Knowledge. Your competence will be assessed as you complete the Physics: Content Knowledge (5265) external assessment. This course of study may take up to 12 weeks to complete.

## Introduction

### Overview

Physics: Content Knowledge covers the advanced content knowledge that a secondary physics teacher is expected to know and understand. Topics include mechanics, electricity and magnetism, optics and waves, heat and thermodynamics, modern physics, atomic and nuclear structure, the history and nature of science, science technology, and social perspectives.

### Getting Started

Welcome to the Physics Content Knowledge course! The goal of this course is to prepare you to pass the Physics subject area Praxis Exam (5265). To earn credit in this course, you must pass the Physics Content Knowledge Praxis Exam with the required score for your state. The cut score for Utah is 136, but your state may require a higher score. The key to success is to comprehensively review what you have learned in previous physics courses. To help with this, you will find many links to videos covering the subjects and topic areas covered on the Praxis. In addition to watching the videos, it is also strongly recommended that you complete the course activities and complete the Conceptual Physics and University Physics practice tests as listed within the course of study. These practice tests contain excellent questions to help you prepare. Scoring 75% or higher on these assignments shows competence in the subject covered and indicates you are ready to move on to the next chapter. If you are unable to score 75% on a given chapter, it is recommended that you review that topic further.

### Welcome Video

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 23 competencies:

- **Competency 207.1.2: Describing Motion**  
The graduate applies vector mathematics to solve motion problems.
- **Competency 207.1.3: Newton's Laws of Motion**  
The graduate applies Newton's laws of motion to solve problems involving force.
- **Competency 207.1.4: Gravitation**  
The graduate applies the law of gravitation and Kepler's laws to solve problems.



- **Competency 207.1.5: Work and Energy**  
The graduate applies the concepts of work and energy to solve problems.
- **Competency 207.1.6: Momentum**  
The graduate applies the concepts of momentum and impulse to solve problems.
- **Competency 207.1.7: Rotational Motion**  
The graduate applies concepts of rotational motion to solve problems involving torque.
- **Competency 207.1.9: Fluids**  
The graduate applies the concepts of static and dynamic fluids to solve problems.
- **Competency 207.1.10: Oscillations**  
The graduate applies the concepts of periodic motion to solve problems.
- **Competency 207.2.1: Mechanical Waves**  
The graduate applies models of wave motion to solve mechanical wave problems, including sound waves.
- **Competency 207.2.3: Thermal Properties**  
The graduate applies concepts of temperature and heat to analyze microscopic and macroscopic properties of matter.
- **Competency 207.2.5: Thermodynamics**  
The graduate applies the concepts of thermodynamics to solve problems.
- **Competency 207.2.6: Nature of Light**  
The graduate applies models of light to solve problems and describe the behavior of light.
- **Competency 207.2.7: Geometric Optics**  
The graduate applies the ray model of light to demonstrate how mirrors and lenses are used in optical instruments.
- **Competency 207.2.8: Physical Optics**  
The graduate applies the wave model of light to demonstrate interference, diffraction, and applications of physical optics.
- **Competency 207.3.1: Electric Field**  
The graduate applies concepts of an electric field and Gauss's law to solve problems.
- **Competency 207.3.2: Electric Potential and Current**  
The graduate applies concepts of electric potential, capacitance, and electric current to solve problems and analyze electric circuits.
- **Competency 207.3.3: Magnetism**  
The graduate applies the concepts of magnetism and the magnetic field to solve problems.
- **Competency 207.3.4: Electromagnetic Induction**  
The graduate applies principles of electromagnetic induction to demonstrate generators and transformers.
- **Competency 207.3.5: Electromagnetic Waves**  
The graduate demonstrates an understanding of electromagnetic waves and the electromagnetic spectrum.
- **Competency 207.4.2: Particle Nature of Light**  
The graduate analyzes experiments and models to demonstrate the particle nature of light.
- **Competency 207.4.4: Special Theory of Relativity**  
The graduate uses the special theory of relativity to solve problems in modern physics.



- **Competency 207.4.8: Nuclear Physics**

The graduate analyzes the structure and behavior of the nucleus and applications of radioactivity and nuclear reactions.

- **Competency 602.6.1: Teaching Methods-Science (Secondary)**

The graduate understands and provides safe, effective, research-based instruction in science.

## Learning Resources

Use the following resources to help prepare for your exam:

- You have access to *Sears and Zamansky's University Physics with Modern Physics* and *Conceptual Physics* e-texts, as well as chapter practice tests for each text to test your knowledge and understanding of each chapter. Completion and understanding of these chapter practice tests is critical to your preparation for this exam.
- ETS has created a [Praxis Study Companion \(PDF\)](#) to help you prepare for this challenging exam. To effectively use this resource in studying, navigate to the "Test Specifications" section (pp. 5–11), and practice explaining the concepts under "Discussion Areas" out loud, as you would when teaching the material. This will help you to build fluency with the content and to identify areas in which you need additional practice. Be sure to work through the twenty sample questions in Section 3 on pages 15–16 and then review the answers to those questions along with their explanations on pages 17–19.
- [Understanding Science: How Science Really Works](#), from your Science, Technology, & Society course, is a thorough and easy-to-read review of the nature of science.
- [Laboratory Safety](#) by Norman Herr, Ph. D., provides details on lab safety best practices and considerations.
- Work through sections 0–8 on the [Math Skills Review](#) to brush up important math skills. The Physics Praxis II exam is a **NO CALCULATOR** exam so your algebra, geometry, and trigonometry skills must be strong.
- The [ETS Practice Exam](#) is a full-length practice test that allows you to work through a set of test questions to simulate what you will experience on the actual day of the PRAXIS exam. After a completed attempt, you can view your score and review explanations for the correct answers. While you can take this practice test as many times as you wish, regardless of any notice to the contrary on the ETS website, there is only one practice test and taking it more than once will not provide different sets of questions or change the order in which they are delivered.

## Study Plan

Work through the Sample Test Questions in Section 3 of the [Praxis Study Companion \(PDF\)](#) and create a study plan based on your results using Sections 4 ("Determine Your Strategy for Success") and 5 ("Develop Your Study Plan") of the [Praxis Study Companion \(PDF\)](#) to guide you.

## 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 time frame.



### Week 1: Get prepared and Review Math Skills

- Review the Praxis Study Companion (PDF).
- Review the Math Skills Review website.

### Week 2: Create a Customized Study Plan and Get Organized

- Schedule an appointment with your course instructor.
- Review topics covered in the Study Companion (PDF).
- Begin reviewing the chapter practice tests in Conceptual and University Physics.

### Week 3: Mechanics Part 1; Vectors, Motion, Newton's Laws, and Work, Energy, and Power (~16% of exam)

- Complete chapter practice tests 1–7 in Conceptual and University Physics.

### Week 4: Mechanics Part II: Momentum, Rotational Motion, Fluids, Gravity, and Harmonic Oscillations (~16% of exam)

- Complete chapter practice tests 8–14 in Conceptual and University Physics.

### Week 5: Waves, Sound, Heat, and Thermodynamics (~17% of exam)

- Complete chapter practice tests 15–20 in Conceptual and University Physics.

### Week 6: Electricity and Magnetism (~19% of exam)

- Complete chapter practice tests 21–31 in Conceptual and University Physics.

### Week 7: Electromagnetic Waves and Optics (~8%)

- Complete chapter practice tests 32–36 in Conceptual and University Physics.

### Week 8: Modern Physics (~12% of exam)

- Complete chapter practice tests 37–39 and 43 in Conceptual and University Physics.

### Week 9: Continue practice tests

- Meet with course instructor.
- Continue with any incomplete chapter practice tests.

### Week 10: Scientific Inquiry, Processes, and Social Perspectives

- Study: Scientific Inquiry, Processes, and Social Perspectives.



Week 11: Review as needed

- Meet with course instructor.
- Review the ETS PRAXIS Study Tools content.
- Practice teaching the topics in the Study Companion (PDF).
- Review topics as needed.

Week 12: Practice Teaching

- Practice teaching the topics in the Study Companion (PDF).
- Review topics as needed.
- Complete the assessment.

## Teaching Dispositions Statement

Please review the [Statement of Teaching Dispositions](#)

## Course Instructor Assistance

While you prepare to demonstrate competency in this subject, remember that course instructors are ready to help you reach your educational goals. As subject matter experts, instructors enjoy and take pride in helping students become reflective learners, problem solvers, and critical thinkers. Course instructors are excited to hear from you and eager to work with you.

Successful students report that working with a course instructor is the key to their success. Course instructors are able to share tips on approaches, tools, and skills that can help you apply the content you are studying. They also provide guidance in assessment preparation strategies, troubleshoot areas of deficiency, and guide you through the revision process if necessary. You should expect to work with course instructors for the duration of your coursework, so you are welcome to contact them as soon as you begin. Course instructors are fully committed to your success!

## Review Physics Content Knowledge

Make sure you have access and acquire all necessary learning resources as listed above.

### Week 1: Get prepared and Review Math Skills

Review:

- [Praxis Study Companion \(PDF\)](#) and create a customized study plan based on your strong and weak topics.
- [Math Skills Review](#) website and build mathematical competence in any weak content areas listed.

### Week 2: Create a Customized Study Plan and Get Organized

Schedule an appointment with your course instructor to review the topics covered in the [Praxis Study Companion \(PDF\)](#):

- Discuss your study plan, and answer any questions about the exam you may have. A list of specific topics and chapter practice tests will be assigned based on your custom study plan.



- Continue with the study plan, complete the assigned chapter practice tests and meet regularly with your course instructor.

*NOTE: There are numerous chapter practice tests that correspond to chapters in the e-texts. Do not procrastinate in your preparations for this comprehensive exam. Pace yourself and keep on track every week to ensure proper preparation.*

## **Week 3: Mechanics Part I: Vectors, Motion, Newton's Laws, and Work, Energy, and Power**

### **Complete Conceptual Physics:**

- Practice tests 1–7 in [Conceptual Physics](#)
  - Navigate to each chapter practice test, and complete all conceptual questions in each chapter.
  - Review the [e-text chapter summary](#) and review the [study area](#) for each chapter.

### **Complete University Physics:**

- Practice tests 1–7 in [University Physics](#)
  - Navigate to each chapter practice test, and complete all conceptual questions in each chapter.
  - Review the [e-text chapter summary](#) and review the [study area](#) for each chapter.

### **Watch:**

- [Praxis Review Mechanics Part 1](#)
- [Praxis Review Mechanics Part 1 Practice Problems](#)

### **Review:**

If this is an area you need to target for further practice, review the course search for the topic and chapter for further resources, and read the entire e-text chapter.

### **Meet with Course Instructor:**

- It is strongly suggested that you meet weekly with your course instructor to review your progress, get questions about specific problems answered, and set goals for the coming week. This will keep you on track towards being prepared to pass this exam.

## **Week 4: Mechanics Part II: Momentum, Rotational Motion, Fluids, Gravity, and Harmonic Oscillations**

### **Complete Conceptual Physics:**

- Practice tests 8–14 in [Conceptual Physics](#)
  - Navigate to each chapter practice test and complete all conceptual questions in each chapter.
  - Review the [e-text chapter summary](#) and review the [study area](#) for each chapter.



### Complete University Physics:

- Practice tests 8–14 in [University Physics](#)
  - Navigate to each chapter practice test and complete all conceptual questions in each chapter.
  - Review the [e-text chapter summary](#) and review the [study area](#) for each chapter.

### Watch:

- [Praxis Review Mechanics Part 2](#)
- [Praxis Review Mechanics Part 2 Practice Problems](#)
  - If this is an area you need to target for further practice, review the course search for the topic and chapter for further resources, and read the entire e-text chapter.

### Meet with Course Instructor:

- It is strongly suggested that you meet weekly with your course instructor to review your progress, get questions about specific problems answered, and set goals for the coming week. This will keep you on track towards being prepared to pass this exam.

## Week 5: Waves, Sound, Heat, and Thermodynamics

### Complete Conceptual Physics:

- Practice tests 15–20 in [Conceptual Physics](#)
  - Navigate to each chapter practice test, and complete all conceptual questions in each chapter.
  - Review the [e-text chapter summary](#) and review the [study area](#) for each chapter.

### Complete University Physics:

- Practice tests 15–20 in [University Physics](#)
  - Navigate to each chapter practice test and complete all conceptual questions in each chapter.
  - Review the [e-text chapter summary](#) and review the [study area](#) for each chapter.

### Watch:

- [Praxis Review Waves Optics Heat Thermo](#)
  - If this is an area you need to target for further practice, review the course search for the topic and chapter for further resources, and read the entire e-text chapter.

### Meet with Course Instructor:

- It is strongly suggested that you meet weekly with your course instructor to review your progress, get questions about specific problems answered, and set goals for the coming week. This will keep you on track towards being prepared to pass this exam.



## Week 6: Electricity and Magnetism

### Complete Conceptual Physics:

- Practice tests 21–31 in [Conceptual Physics](#)
  - Navigate to each chapter practice test, and complete all conceptual questions in each chapter.
  - Review the [e-text chapter summary](#) and review the [study area](#) for each chapter.

### Complete University Physics:

- Practice tests 21–31 in [University Physics](#)
  - Navigate to each chapter practice test under the assignments tab.
  - Review the [e-text chapter summary](#) and review the [study area](#) for each chapter.

### Watch:

- [Praxis Review Electricity and Magnetism](#)
  - If this is an area you need to target for further practice, review the course search for the topic and chapter for further resources, and read the entire e-text chapter.

### Meet with Course Instructor:

- It is strongly suggested that you meet weekly with your course instructor to review your progress, get questions about specific problems answered, and set goals for the coming week. This will keep you on track towards being prepared to pass this exam.

## Week 7: Electromagnetic Waves and Optics

### Complete Conceptual Physics:

- Practice tests 32–36 in [Conceptual Physics](#)
  - Navigate to each chapter practice test, and complete all conceptual questions in each chapter.
  - Review the [e-text chapter summary](#) and review the [study area](#) for each chapter.
- Practice tests 32–36 in [University Physics](#)
  - Navigate to each chapter practice test under the assignments tab.
  - Review the [e-text chapter summary](#) and review the [study area](#) for each chapter.
  - If this is an area you need to target for further practice, review the course search for the topic and chapter for further resources, and read the entire e-text chapter.

### Meet with Course Instructor:

- It is strongly suggested that you meet weekly with your course instructor to review your progress, get questions about specific problems answered, and set goals for the coming week. This will keep you on track towards being prepared to pass this exam.

## Week 8: Modern Physics





### Complete Conceptual Physics:

- Practice tests 37–39, 43 in [Conceptual Physics](#)
  - Navigate to each chapter practice test, and complete all conceptual questions in each chapter.
  - Review the [e-text chapter summary](#) and review the [study area](#) for each chapter.

### Complete University Physics:

- Practice tests 37–39, 43 in [University Physics](#)
  - Navigate to each chapter practice test under the assignments tab.
  - Review the [e-text chapter summary](#) and review the [study area](#) for each topic.
  - Watch the following [Praxis Review Modern Modern Physics and General Science](#).
  - If this is an area you need to target for further practice, review the course search for the topic and chapter for further resources, and read the entire e-text chapter.

### Meet with Course Instructor:

- It is strongly suggested that you meet weekly with your course instructor to review your progress, get questions about specific problems answered, and set goals for the coming week. This will keep you on track towards being prepared to pass this exam.

### Week 9: Continue Practice Tests

- Meet with your course instructor to discuss your progress so far, your plans for continuing study, and scheduling for your assessment.
- Continue with any incomplete chapter practice tests from [Conceptual Physics](#) and [University Physics](#) to test your readiness for the exam.

### Week 10: Scientific Inquiry, Processes, and Social Perspectives Study:

- The topic Nature of Science: Scientific Inquiry, Methodology, Techniques, and History:
- Practice explaining, as you would when teaching a class, the topics listed on page 6 of the [Study Companion \(PDF\)](#).

### Review:

[Understanding Science: How Science Really Works](#) and "[Lab Safety](#)" to refresh your understanding of these fundamental concepts, as needed. Spend time on any topics you need to review or gain a better understanding of.

### Week 11: Review as Needed

- Meet with your course instructor to discuss your readiness for the practice test.
- **Review** the Understanding the Assessment content in the [Study Companion \(PDF\)](#).
- **Practice** teaching the topics.
- **Review** topics as needed.
- Take the [practice test](#) for the Physics Praxis exam. Review your answers and the



explanations for those that were incorrect.

The [ETS Practice Exam](#) is a full-length practice test that allows you to work through a set of test questions to simulate what you will experience on the actual day of the PRAXIS exam. After a completed attempt, you can view your score and review explanations for the correct answers. You will have unlimited attempts regardless of any notice to the contrary on the ETS website. This practice test includes one set of test questions. Retaking it will not provide different sets of questions or change the order in which they are delivered.

## **Week 12: Practice Teaching**

- **Practice** teaching the topics in the [Study Companion \(PDF\)](#).
- **Review** topics as needed.
- **Complete** the assessment.

## **ETS PRAXIS Study Tools**

Understandably, most people are nervous on exam day. To help reduce any anxiety, you should learn more about the exam experience, and how to best prepare.

Watch the following videos to better understand the assessment. The first is an interactive demonstration of how the exam is administered, the tools available to you during the exam, and a peek at the general format of questions. The second will help you to set expectations for the day of testing.

- [The Praxis Series: Computer-Delivered Testing Demonstration \(Flash\) | View Transcript](#)
- [Welcome to Your Computerized PRAXIS Testing Experience](#) (7 minutes)

Reading the following sections of the helpful [Praxis Study Companion \(PDF\) created by ETS will help you prepare for this challenging exam](#):

1. Learn About Your Test
2. Familiarize Yourself with Test Questions
3. Practice with Sample Test Questions
7. Review Smart Tips for Success
10. Understand Your Scores

## **Outside Vendor Assessment**

Complete the Praxis II Physics: Content Knowledge (5265) exam. This is a third-party exam offered through ETS. Many states require individuals to pass this exam as part of the teacher certification process. WGU requires you to pass this exam as a program requirement, regardless of the state in which you hold or are seeking certification.



- For directions on how to receive access to outside vendor assessments, see the [How to Schedule a Praxis Exam](#) page.
- WGU will pay for your first two attempts of the Praxis exam. You will be responsible for paying for third and subsequent attempts.
- This exam is computer-delivered. WGU will not pay for extended or emergency registration, so be sure to plan ahead when scheduling the exam.
- Visit [Test Centers and Dates](#) to see where and when tests are available in your area.
- In order to receive a pass on your degree plan, you must pass the exam based upon the WGU cut score (136/200). Additionally, if the state in which you seek licensure also requires the Praxis exam, you must pass the exam based on that state's cut score before you will be admitted into Demonstration Teaching or allowed to graduate. Please note that it is possible to pass the exam based on either the WGU cut score or your state's cut score, and still need to take it again in order to satisfy the other cut score.
- If your state requires you to take a state exam for teacher licensure, you are still required to take the Praxis as a WGU graduation requirement in addition to the state exam you must take for licensure.
- What to Bring to your exam.

## Submitting Outside Vendor Assessment Scores

After completing an outside vendor assessment, follow the directions for submitting a score report on the [Following Outside Vendor Assessments](#) page.