This course supports the assessments for DDV2. The course covers 10 competencies and represents 4 competency units.

**Introduction**

**Overview**
The main topics of this course include:

- astronomy,
- geology,
- meteorology, and
- oceanography.

Watch the following video for an introduction to this course:

**Competencies**
This course provides guidance to help you demonstrate the following 10 competencies:

- Competency 204.5.1: Astronomy
  The graduate has a broad understanding of the basic concepts of astronomy.
- Competency 204.5.2: Geology
  The graduate has a broad understanding of the principles of geology.
- Competency 204.5.3: Meteorology
  The graduate has a broad understanding of the concepts of meteorology.
- Competency 204.5.4: Oceanography
  The graduate has a broad understanding of the basic concepts of oceanography.
- Competency 205.2.1: Earth Systems Structure and Function
  The graduate understands the structure and function of Earth systems, including the closely coupled subsystems: geosphere, hydrosphere, atmosphere, and biosphere.
- Competency 205.2.2: Earth Systems Equilibrium
  The graduate understands the Earth's history and that the Earth exists in a state of dynamic equilibrium that evolves over geologic time.
- Competency 205.2.3: Solar System
  The graduate understands the components and properties of the solar system, and understands that the major components are in a state of regular and predictable motion.
- Competency 205.2.4: The Universe
  The graduate understands the composition, history, and properties of the earth and the universe, and the scale of the universe in space and time.
- Competency 205.2.5: Oceanographic Concepts
  The graduate has a deep understanding of the following oceanographic concepts: global plate tectonics, the origin of the oceans, air/sea interactions, and human interactions with the oceans.
- Competency 602.6.1: Teaching Methods — Science (Secondary)
  The graduate understands and provides safe, effective, research-based instruction in
Teaching Dispositions Statement
Please review the Statement of Teaching Dispositions.

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

Successful students report that working with a course mentor is the key to their success. Course mentors are able to share tips on approaches, tools, and skills that can help you apply the content you’re studying. They also provide guidance in assessment preparation strategies and troubleshoot areas of deficiency. Even if things don’t work out on your first try, course mentors act as a support system to guide you through the revision process. You should expect to work with course mentors for the duration of your coursework, so you are welcome to contact them as soon as you begin. Course mentors are fully committed to your success!

Preparing for Success

The information in this section is provided to detail the resources available for you to use as you complete this course.

Your Learning Resources
The learning resources listed in this section are required to complete the activities in this course. For many resources, WGU has provided automatic access through the course. However, you may need to manually enroll in or independently acquire other resources. Read the full instructions provided to ensure that you have access to all of your resources in a timely manner.

Enroll in Learning Resources

You will need to enroll in or subscribe to additional learning resources as a part of this course.

You may already have enrolled in these resources for other courses. Please check the "Learning Resources" tab and verify that you have access to the following learning resources. If you do not currently have access, please enroll or renew your enrollment at this time.

Note: For instructions on how to enroll in or subscribe to learning resources through the "Learning Resources" tab, please see the "Acquiring Your Learning Resources" page.

Earth Science
This web-based resource provides access to geoscience animations, practice quizzes, and the following e-text:

Purchase Learning Resources

Listed below are the learning resource materials you will need to obtain.

**Study Guide**
Purchase the following Study Guide from the [ETS website](https://www.ets.org):

- Study Guide (Print) Sciences: Content Knowledge Study Guide

Within this resource are practice questions for the Earth and Space Sciences: Content Knowledge exam. After working through this course, you will use these practice questions as the preassessment for the actual exam.

**Basic Scientific Principles**

Science is about gathering data and determining the most probable explanation based on the data. The explanations can change over time, as new data is collected. Scientists use tools to collect data and follow safety procedures while using those tools.

**Methodology**

You will explore the processes involved in scientific inquiry, the disciplines within science, and scientific terms. Within all the disciplines, scientists incorporate a continual process of making observations, asking questions, and testing the ideas to learn more.

**Scientific inquiry methods**

From the [Test at a Glance](https://www.ets.org) document, read the following section in A. Scientific Methodology, Techniques, and History:

- 1. Scientific inquiry methods

To review these processes, read through the following flowchart which represents the process of scientific inquiry.

- [How science works: The flowchart](https://www.ets.org)

**Measurement, Data, and Models**

From the [Test at a Glance](https://www.ets.org) document, read the following sections in A. Scientific Methodology, Techniques, and History:

- 2. Collect, evaluate, process, interpret, and report data
- 3. Interpret and draw conclusions from models and data presented in various forms

Use the following resource to review these concepts:

- [Visionlearning](https://www.ets.org)

View the topic "Process of Science" from the library menu on the right.
Safety
Providing a safe learning environment is essential in the classroom. Teachers need to be aware of proper laboratory procedures to ensure a safe experience for the students. Performing experiments helps with the learning process and should be a part of the science curriculum.

Creating a safe environment

From the Test at a Glance document, read the following section in A. Scientific Methodology, Techniques, and History:

- 4. Use materials and equipment in the laboratory and the field safely and appropriately.

Use the following resource to review laboratory safety:

- Laboratory Safety

Scientific Ideas Change Over Time
This section covers some of the scientific contributions made by major historical figures.

Keeping track of historical figures

From the Test at a Glance document, read the following section in A. Scientific Methodology, Techniques, and History:

- 6. Historical roots of the Earth and Space Sciences

As you work through the rest of this course, make note of the major historical figures who have contributed to science.

Geology

Although Earth has a rocky crust, there is much movement on its surface. Air, water, and surface are constantly moving. The water cycle causes wear and tear. Gravity causes boulders and mud to move downhill. Convection currents keep the earth's inner materials moving, which in turn moves the earth's plates. Geology is the study of these processes.

Earth Materials and Surface Processes
When people dig into the earth to build structures, they are only scratching the surface of the earth's crust. In this topic you will learn about the makeup of the earth's crust and what what lies beneath it.

Minerals

Log in to the Earth Science resource to take the Chapter 2 Earth Science quiz to check your understanding of the following concept:

- identification of minerals

If your score is less than 75%, review the following chapter within the Earth Science e-text:
• chapter 2 ("Minerals: Building Blocks of Rocks")

Rocks

Log in to the Earth Science resource to take the Chapter 3 Earth Science quiz to check your understanding of the following concepts:

• characteristics and formation of igneous, sedimentary, and metamorphic rocks
• rock cycle

If your score is less than 75%, review the following chapter within the Earth Science e-text:

• chapter 3 ("Rocks: Materials of the Solid Earth")

Weathering

Log in to the Earth Science resource to take the Chapter 4 Earth Science quiz to check your understanding of the following concepts:

• chemical and physical weathering
• erosion and deposition
• weathering caused by plants
• nutrient uptake from soil by plants
• processes of soil formation and resulting characteristics

If your score is less than 75%, review the following chapter within the Earth Science e-text:

• chapter 4 ("Weathering, Soil, and Mass Wasting")

Running Water

Log in to the Earth Science resource to take the Chapter 5 Earth Science quiz to check your understanding of the following concepts:

• characteristics and processes of surface water and groundwater
• general structure of the water cycle
• distribution of water on Earth
• streams and drainage systems

If your score is less than 75%, review the following chapter within the Earth Science e-text:

• chapter 5 ("Running Water and Groundwater")

Glaciers

Log in to the Earth Science resource to take the Chapter 6 Earth Science quiz to check your understanding of the following concepts:

• characteristics of glaciers and polar ice and how they move and change over time
• long-term changes in Earth’s motions
If your score is less than 75%, review the following chapter within the Earth Science e-text:

- chapter 6 ("Glaciers, Deserts, and Wind")

**Tectonics and Internal Processes**

In the early 1900s, there were no planes to circumnavigate the Earth, no satellite imagery to view the planet from a distance, and no submersibles to view ocean ridges. Despite lacking these technological advances, Alfred Wegener was able to propose the idea of continental drift. With the use of modern technology, scientists have discovered more evidence to support the theory of plate tectonics.

**Plate Tectonics**

Log in to the Earth Science resource to take the Chapter 7 Earth Science quiz to check your understanding of the following concept:

- theory of plate tectonics and its supporting evidence

If your score is less than 75%, review the following chapter within the Earth Science e-text:

- chapter 7 ("Plate Tectonics: A Scientific Theory Unfolds")

**Earthquakes**

Log in to the Earth Science resource to take the Chapter 8 Earth Science quiz to check your understanding of the following concepts:

- characteristics of earthquakes and how they provide information about Earth's interior
- layered structure of Earth and related processes
- tsunamis

If your score is less than 75%, review the following chapter within the Earth Science e-text:

- chapter 8 ("Earthquakes and Earth’s Interior")

**Volcanoes**

Log in to the Earth Science resource to take the Chapter 9 Earth Science quiz to check your understanding of the following concepts:

- volcanic characteristics and processes
- effects of volcanoes on climate

If your score is less than 75%, review the following chapter within the Earth Science e-text:

- chapter 9 ("Volcanoes and Other Igneous Activity")

**Mountain Building**

Log in to the Earth Science resource to take the Chapter 10 Earth Science quiz to check your
understanding of the following concept:

- deformation of Earth's crust and resulting features

If your score is less than 75%, review the following chapter within the Earth Science e-text:

- chapter 10 ("Mountain Building")

**History of the Earth and its Life Forms**

Scientists collect data from around the world to better understand Earth's history. Based on the evidence collected, a geologic timeline for Earth has been put together. In this timescale, a hundred, or even a thousand years is a relatively short time span.

**Geologic Time**

Log in to the Earth Science resource to take the Chapter 11 Earth Science quiz to check your understanding of the following concepts:

- principles of uniformitarianism
- principles of relative age dating
- principles of absolute age dating
- geologic time scale
- fossil record as evidence of the origin and development of life

If your score is less than 75%, review the following chapter within the Earth Science e-text:

- chapter 11 ("Geologic Time")

**Earth’s Evolution**

Log in to the Earth Science resource to take the Chapter 12 Earth Science quiz to check your understanding of the following concept:

- theories of Earth's formation and development of its systems

If your score is less than 75%, review the following chapter within the Earth Science e-text:

- chapter 12 ("Earth’s Evolution Through Geologic Time")

**Geologic and Topographic Maps**

Please watch these videos on Geologic Maps and Topographic Maps to see how geologists share information about Earth's surface, bedrock, and fossil layers.

**Geologic Maps**

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

Note: To download this video, right-click the following link and choose "Save as...": download video.

Oceanography

From the earth's surface, only the ocean's top layer, exposed to the sun, can be seen. Using instruments such as sonar, scientists can detect the structures that are at the bottom of the ocean. Sea level is always the starting point for elevation measurements, whether measuring the height of a mountain or the depth of an abyss.

Earth's Hydrosphere

The ocean floor has a varied terrain, just as land's surface does. Boundaries between continental plates are seen as ridges where new crust can be forming.

Ocean Floor

Log in to the Earth Science resource to take the Chapter 13 Earth Science quiz to check your understanding of the following concepts:

- island formation and change
- seafloor topography
- marine sediments
- coral reefs

If your score is less than 75%, review the following chapter within the Earth Science e-text:

- chapter 13 ("The Ocean Floor")

Diversity of Ocean Life

Log in to the Earth Science resource to take the Chapter 14 Earth Science quiz to check your understanding of the following concepts:

- organisms around hydrothermal vents
- light penetration and photosynthesis in oceans
- salinity, temperature, and density
- hydrothermal vents

If your score is less than 75%, review the following chapter within the Earth Science e-text:

- chapter 14 ("Ocean Water and Ocean Life")

Oceans

Log in to the Earth Science resource to take the Chapter 15 Earth Science quiz to check your
understanding of the following concept:

- effects of ocean circulation on climate
- surface currents and deep-ocean circulation
- effects of waves
- wave formation
- estuaries
- tidal effects
- tides
- upwelling of nutrients
- barrier islands

If your score is less than 75%, review the following chapter within the Earth Science e-text:

- chapter 15 (“The Dynamic Ocean”)

**Meteorology**

Earth’s atmosphere allows life to exist on this planet. Meteorology is the study of Earth’s atmosphere.

**Earth’s Atmosphere**

Although air is not visible, its weight still exerts pressure on Earth. Air will move from areas of high pressure to areas of low pressure. This movement of air is felt as wind.

**The Atmosphere**

Log in to the Earth Science resource to take the Chapter 16 Earth Science quiz to check your understanding of the following concepts:

- various layers and their physical properties
- chemical composition of Earth’s atmosphere
- humans’ effect on atmosphere’s composition
- variations in atmospheric temperature, pressure, and density
- effect of the Earth’s axial tilt on seasons
- impact of human activity on the rate of climate change
- effects of latitude, geographic location, and elevation on climate
- impact of society on air pollution, greenhouse gases, and ozone depletion
- processes involving greenhouse gases
- energy budget
- how variations in solar radiation effect climate

If your score is less than 75%, review the following chapter within the Earth Science e-text:

- chapter 16 (“The Atmosphere: Composition, Structure, and Temperature”)

**Clouds**

Log in to the Earth Science resource to take the Chapter 17 Earth Science quiz to check your
understanding of the following concepts:

- cloud formation
- cloud types
- unusual properties of water and effect on Earth Systems
- humidity, dew point, and frost point
- formation of various types of precipitation
- phase changes
- how proximity to mountains and oceans affect climate

If your score is less than 75%, review the following chapter within the Earth Science e-text:

- chapter 17 ("Moisture, Clouds, and Precipitation")

Wind

Log in to the Earth Science resource to take the Chapter 18 Earth Science quiz to check your understanding of the following concepts:

- origin of wind
- circulation, Coriolis effect
- variations in atmospheric temperature, pressure, and density
- daily/seasonal/annual variations in meteorology
- effects of atmospheric circulation on climate
- el Nino, la Nina
- how proximity to mountains and oceans affect climate

If your score is less than 75%, review the following chapter within the Earth Science e-text:

- chapter 18 ("Air Pressure and Wind")

Weather Patterns

Log in to the Earth Science resource to take the Chapter 19 Earth Science quiz to check your understanding of the following concepts:

- air masses, fronts, storms, and severe weather such as hurricanes and tornados
- development and movement of weather patterns
- interpretation of atmospheric data
- fundamentals of weather forecasting

If your score is less than 75%, review the following chapter within the Earth Science e-text:

- chapter 19 ("Weather Patterns and Severe Storms")

Climate Zones

Log in to the Earth Science resource to take the Chapter 20 Earth Science quiz to check your understanding of the following concept:
- characteristics and locations of climate zones
- human activities which can affect climate and seasons
- impact of society on sea level change

If your score is less than 75%, review the following chapter within the Earth Science e-text:

- chapter 20 (“World Climates and Global Climate Change”)

**Astronomy**

As technology improves, so does the information that scientists can gather on the solar system and the universe. For example, Galileo was able to observe Jupiter’s moons by using a telescope. As technology has improved, scientists have learned more information about our Earth’s system and the universe.

**Our Solar System and Beyond**

Earth’s solar system includes four dense inner terrestrial planets orbiting the sun and four large outer Jovian planets that are less dense. Other objects rotate around the sun as well.

**Earth-Moon System**

Log in to the Earth Science resource to take the Chapter 21 Earth Science quiz to check your understanding of the following concepts:

- phases of the moon
- eclipses
- laws of motion
- rotation and revolution

If your score is less than 75%, review the following chapter within the Earth Science e-text:

- chapter 21 (“Origins of Modern Astronomy”)

**Solar System**

Log in to the Earth Science resource to take the Chapter 22 Earth Science quiz to check your understanding of the following concepts:

- location, orbits, and characteristics of the planets
- characteristics of asteroids, meteoroids, comets, dwarf/minor planets
- theories of the formation of the solar system
- structure, characteristics, and orbit of the Earth’s moon
- natural satellites

If your score is less than 75%, review the following chapter within the Earth Science e-text:

- chapter 22 (“The Planets: A Brief Tour”)

**The Sun**
Log in to the Earth Science resource to take the Chapter 23 Earth Science quiz to check your understanding of the following concepts:

- structure and characteristics of the sun
- effect of solar wind on Earth
- the importance and effect of telescopes, satellites, and space probes on everyday life

If your score is less than 75%, review the following chapter within the Earth Science e-text:

- chapter 23 ("Light, Astronomical Observations, and the Sun")

Beyond Our Solar System

Log in to the Earth Science resource to take the Chapter 24 Earth Science quiz to check your understanding of the following concepts:

- structure and classification of galaxies
- stages in the life cycle of stars
- theories and observations that relate to the origin and development of the universe
- color, temperature, apparent brightness, and luminosity, including H-R diagram
- formation of elements
- supermassive black holes

If your score is less than 75%, review the following chapter within the Earth Science e-text:

- chapter 24 ("Beyond Our Solar System")

Test-Taking Strategies

To be fully prepared for your final assessment, read the following chapters from your purchased Praxis Study Guide, Sciences: Content Knowledge:

- chapter 1 ("Introduction to the Praxis")
- chapter 2 ("Background Information")
- chapter 5 ("Study Topics for the Earth and Space Sciences: Content Knowledge Test")

Final Steps

Congratulations on completing the activities in this course! This course has prepared you to complete the assessments associated with this course. If you have not already been directed to complete the assessments, schedule and complete your assessments now.

Final Review

To be fully prepared for your final assessment, read the following chapter from the Praxis Study Guide, Sciences: Content Knowledge:

- chapter 13 ("Practice Questions for the Earth and Space Sciences: Content Knowledge Test")
Answer the practice questions with the same conditions as you would during the actual exam. Use the answer sheet provided. Limit your time to the minutes listed. Complete all the questions in one sitting. Calculators are prohibited. Afterwards, score your answers, and read the explanations as needed.

Outside Vendor Assessment
You will complete the Praxis II, Earth and Space Sciences: Content Knowledge (0571) exam. This is a third-party exam offered through ETS. WGU requires you to pass this exam as a program requirement regardless of the state in which you hold or are seeking certification.

- WGU will pay for your first two attempts of the Praxis exam. You will be responsible for paying third and subsequent attempts.
- Visit Test Centers and Dates to see where and when tests are available.
- In order to receive a pass on your Degree Plan, you must pass the exam based upon the WGU cut score. 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. 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.

You will need to submit your scores to WGU after completing this exam. Once you have submitted your passing score, you will receive a “pass” on your Degree Plan for the assessment.

Complete the Praxis II, Earth and Space Sciences: Content Knowledge (0571).
The procedure for registering for Praxis exams is different from the registration procedure for other WGU objective exams. Please follow the following directions very carefully:

- How to Schedule a Praxis Exam

Follow the ETS guidelines on what to bring on exam day by accessing the following web page:

- “What to Bring”

Note: You must schedule your Praxis exam through WGU in order to have WGU pay for the exam.

Submitting Outside Vendor Assessment Scores
After completing an external assessment, follow the directions for submitting a score report on the "Following Outside Vendor Assessments" page.

The WGU Library
The WGU Library is available online to WGU students 24 hours a day.

For more information about using the WGU Library, view the following videos on The WGU Channel:
Introducing the WGU library

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

Searching the WGU library

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

**Center for Writing Excellence: The WGU Writing Center**

If you need help with any part of the writing or revision process, contact the Center for Writing Excellence (CWE). Whatever your needs—writing anxiety, grammar, general college writing concerns, or even ESL language-related writing issues—the CWE is available to help you. The CWE offers personalized individual sessions and weekly group webinars. For an appointment, please e-mail [writingcenter@wgu.edu](mailto:writingcenter@wgu.edu).

**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). Further information on WGU's Accessibility policy and process can be viewed in the student handbook at the following link:

[Accessibility Policy](#)

**Student Support**

WGU values your input! Please submit any feedback you have using the following form:

[Course Feedback](#)

Access the WGU Library 24 hours a day, 7 days a week:
Visit the Student Success Center to access a variety of topics that will help you succeed at WGU:

Contact the Center for Writing Excellence (CWE) for help with any part of the writing or revision process: