



Course Number and Title: SCI 150 Earth and Space Science

Campus Location:

Georgetown, Dover, Stanton, Wilmington

Effective Date:

201852

Prerequisite:

Test Score or ENG 101 or higher, SSC 100

Co-Requisites:

None

Course Credits and Hours:

3.00 credits

3.00 lecture hours/week

1.00 lab hours/week

Course Description:

This course is a general introduction to the four sub-disciplines of earth science: geology, oceanography, meteorology, and astronomy. The processes and features related to the earth's surface, interior, atmosphere, oceans, and astronomical surroundings are actively investigated. Analyses of the interrelationships among the four sub-disciplines are included.

Required Text(s):

Obtain current textbook information by viewing the [campus bookstore - https://www.dtcc.edu/bookstores](https://www.dtcc.edu/bookstores) online or visit a campus bookstore. Check your course schedule for the course number and section.

Additional Materials:

None

Schedule Type:

Disclaimer:

None

Core Course Performance Objectives (CCPOs):

1. Explain the importance of minerals in geology. (CCC 1, 2, 6)
2. Describe the relationship between rocks and various geological processes. (CCC 1, 2, 6)
3. Explain external processes that sculpt the earth's physical landscape. (CCC 1, 2, 6)
4. Explain the theory of plate tectonics and how it relates to the processes that produce Earth's major surface features. (CCC 1, 2, 6)
5. Describe the structure, composition, and dynamic processes of the earth's oceans.(CCC 1, 2, 6)
6. Explain the processes that govern weather and climate. (CCC 1, 2, 6)
7. Explain the origin and structure of our solar system. (CCC 1, 2, 6)

See Core Curriculum Competencies and Program Graduate Competencies at the end of the syllabus. CCPOs are linked to every competency they develop.

Measurable Performance Objectives (MPOs):

Upon completion of this course, the student will:

1. Explain the importance of minerals in geology.
 1. Describe the characteristics that an Earth material must possess to be considered a mineral.
 2. Describe the properties used in mineral classification.
2. Describe the relationship between rocks and various geological processes.
 1. Explain the rock cycle.
 2. Describe the two criteria used to classify igneous rocks.
 3. Explain the difference between mechanical weathering and chemical weathering of rocks.
 4. Explain the relationship between the rate of cooling and the crystal size of minerals.
 5. Identify the different categories of sedimentary rocks.
 6. Discuss the processes that change sediment into sedimentary rock.
 7. Explain how metamorphic rocks form.
3. Explain external processes that sculpt the earth's physical landscape.
 1. Identify where weathering, mass wasting, and erosion fit into the rock cycle.
 2. Explain the role of mass wasting in the development of valleys.

3. Discuss the factors that trigger and influence mass wasting.
4. Describe the different paths that water takes through the hydrologic cycle.
5. Explain the distribution and movement of groundwater.
6. Describe environmental problems associated with groundwater.
7. Explain the role of glaciers in the hydrologic and rock cycles.
8. Describe how glaciers move.
9. Explain the processes of glacier erosion and the major features created by these processes.
10. Describe the ways in which wind transports sediment.
11. Identify features created by wind erosion.
4. Explain the theory of plate tectonics and how it relates to the processes that produce Earth's major surface features.
 1. Explain the importance of the lithosphere and asthenosphere in the plate tectonics theory.
 2. Investigate the historical events that led to the theory of plate tectonics.
 3. Describe each of the Earth's layers.
 4. Explain the difference between divergent and convergent plate boundaries.
 5. Describe the process of seafloor spreading.
 6. Identify the three types of convergent plate boundaries and where each type can be found.
 7. Describe the relative motion along a transform fault boundary.
 8. Explain how the size and shape of individual plates change over time.
 9. Explain the evidence used to support the theory of plate tectonics.
 10. Explain two of the primary driving forces of plate motion.
 11. Describe the primary causes and mechanisms of most earthquakes and tsunamis.
 12. List the major destructive forces triggered by earthquake vibrations.
 13. Describe the two types of mountain formations.
 14. Describe the two primary factors that determine the nature of a volcanic eruption.
 15. Explain how the global distribution of volcanic activity is related to plate tectonics.
5. Describe the structure, composition, and dynamic processes of the earth's oceans.
 1. Identify the four main ocean basins.
 2. List the main elements that contribute to the ocean's salinity.
 3. Identify the causes of variations in salinity.
 4. Identify the basic characteristics of ocean ridges.
 5. Explain how seafloor sediment can be used to study climate change.
 6. Describe the factors that create and influence ocean currents.
 7. Describe the relationship between climates and ocean currents.
 8. Describe how waves erode and move sediment along the shore.
 9. Identify the cause of tides and their cyclical nature.
6. Explain the processes that govern weather and climate.
 1. Explain the difference between weather and climate.
 2. List the different atmospheric layers based on temperature.
 3. Explain what causes the different seasons.
 4. Explain the greenhouse effect.
 5. Discuss the factors that cause temperature to vary from place to place and time to time.
 6. Identify the six processes by which water changes from one state of matter to another.
 7. Describe the four mechanisms that cause air to rise.
 8. Explain the relationship between atmospheric stability and weather.
 9. Identify the basic cloud types based on their physical characteristics.
 10. Describe the different types of fog and how they are formed.
 11. Describe the atmospheric conditions that produce sleet, freezing rain, and hail.
 12. Describe the three forces that either create or alter wind.
 13. List three types of local winds and how they are formed.
 14. Describe the weather associated with low- and high-pressure centers.
 15. Identify the major factors that influence the global distribution of precipitation.
 16. Describe the classification and weather associated with different air masses.
 17. Describe the three states in the development of a thunderstorm.
 18. Describe the atmospheric conditions that are favorable to the formation of tornadoes.
 19. Identify the conditions that promote hurricane formation.
7. Explain the origin and structure of our solar system.
 1. Describe the formation of the solar system according to the nebular theory.
 2. Explain the difference between terrestrial and Jovian planets.
 3. Describe the major features of the earth's moon.
 4. Describe the principal characteristics of asteroids, comets, meteoroids, and dwarf planets.
 5. Describe the stages of stellar evolution.
 6. List the three major types of galaxies.
 7. Explain the big bang theory.

Evaluation Criteria/Policies:

Students must demonstrate proficiency on all CCPOs at a minimal 75 percent level to successfully complete the course. The grade will be determined using the Delaware Tech grading system:

92	-	100	=	A
83	-	91	=	B
75	-	82	=	C
0	-	74	=	F

Students should refer to the [Student Handbook - https://www.dtcc.edu/handbook](https://www.dtcc.edu/handbook) for information on the Academic Standing Policy, the Academic Integrity Policy, Student Rights and Responsibilities, and other policies relevant to their academic progress.

Core Curriculum Competencies (CCCs are the competencies every graduate will develop):

1. Apply clear and effective communication skills.
2. Use critical thinking to solve problems.
3. Collaborate to achieve a common goal.
4. Demonstrate professional and ethical conduct.
5. Use information literacy for effective vocational and/or academic research.
6. Apply quantitative reasoning and/or scientific inquiry to solve practical problems.

Program Graduate Competencies (PGCs are the competencies every graduate will develop specific to his or her major):

None

Disabilities Support Statement:

The College is committed to providing reasonable accommodations for students with disabilities. Students are encouraged to schedule an appointment with the campus Disabilities Support Counselor to request an accommodation needed due to a disability. A listing of campus Disabilities Support Counselors and contact information can be found at the [disabilities services - https://www.dtcc.edu/disabilitysupport](https://www.dtcc.edu/disabilitysupport) web page or visit the campus Advising Center.