

PELLISSIPPI STATE TECHNICAL COMMUNITY COLLEGE  
MASTER SYLLABUS

**GEOL 1310**  
**CONCEPTS OF EARTH SCIENCE**

**Class Hours: 2.0**

**Credit Hours: 3.0**

**Laboratory Hours: 3.0**

**Date Revised: Spring  
03**

**Catalog Course Description:**

This course covers basic principles from the fields of geology, oceanography, meteorology, and astronomy. Topics include: map interpretation, minerals and rocks, processes acting at the Earth's surface and within the Earth, plate tectonics, geologic time and dating, water movements, ocean floor, weather and climate, composition and motions of the Earth, solar system, phases of the moon, origin and life cycles of stars, and galaxies.

**Entry Level Standards:**

Students must be able to read and write at the college level. Students must have math skills at the DSPM 0850 level or higher.

**Prerequisites/Corequisites:**

Successful completion of one year of high school science.

**Textbook(s) and Other Reference Materials Basic to the Course:**

Reference Textbook:

*Earth Science*, 10th ed, by Tarbuck and Lutgens, 2003, Prentice Hall.

Laboratory Manual:

*Applications & Investigations in Earth Science*, 4th, by Tarbuck, Lutgens, and Pinzke, 2003, Prentice Hall.

*National Science Education Standards*, National Research Council, 1996, www.nas.edu

World Wide Web:

Access to the World Wide Web and e-mail service. These services are available on campus, but home access is recommended.

**I. Week/Unit/Topic Basis:**

<b>Week</b>	<b>Topic</b>
1	Lecture: Intro. to Geology 1310 Earthmaterials – minerals & rocks Minerals and rocks cont. Lab: Classes Begin, Introduction to Concepts of Earth Science Lab Metric system, metric conversions

- 2           Lecture: Weathering, mass wasting, water, groundwater  
Running water and groundwater cont.  
Lab: Topographic maps, map scale conversions
- 3           Lecture: Exam 1(Ch 1 – 4)  
Earthquakes and Earth' s interior  
Earthquakes and Earth' s interior cont.  
Lab: Identification of common minerals
- 4           Lecture: Plate tectonics, volcanoes & plutons  
Volcanoes & other igneous activity cont.  
Lab: Identification of igneous, metamorphic, and sedimentary rock
- 5           Lecture: Mountain building & geologic time  
Geologic time cont.  
Lab: Running water and groundwater
- 6           Lecture: Exam 2(Ch 6 – 10)  
Earth' s history  
A brief summary of Earth history cont.  
Lab: Earthquakes and the Earth' s interior
- 7           Lecture: Ocean floor, ocean water, and ocean life  
Ocean water and ocean life cont.  
Lab: Determining geologic ages
- 8           Lecture: Dynamic ocean  
Lab: Lab Exam(Ex1, 2, 3, 4, 6, & 8)
- 9           Lecture: Exam 3(Ch 11 – 14)  
Atmosphere:composition, structure, temperature  
Atmosphere cont.  
Lab: Introduction to oceanography
- 10          Lecture: Moisture, clouds, precipitation, air pressure, wind  
Air pressure and wind cont.  
Lab: Atmosphere, moisture, pressure, and wind
- 11          Lecture: Weather patterns, severe storms, & climate  
Climate cont.  
Lab: Air masses, middle-latitude cyclone, & weather maps
- 12          Lecture: Exam 4(Ch 15 – 19)  
Introduction to astronomy  
Introduction to astronomy cont.  
Lab: Astronomical observations
- 13          Lecture: Our solar system, light astro observations, Sun  
Student presentations  
Lab: The Moon and Sun
- 14          Lecture: Sun and Beyond our solar system  
Lab: Lab Exam(Ex 9, 14, 15, 17, & 20)
- 15          Lecture: Exam 5(Ch 20 – 23)  
Semester Review

Lab: Student project presentations

16                   Lecture: Student presentations  
                      Comprehensive Final Exam  
                      Lab: No Lab

## **II. Course Objectives\*:**

This is an introductory earth science course that presents the scientific method and basic concepts of geology, oceanography, meteorology, and astronomy.

- A.           Develop an understanding of the K-8 science education curriculum. I.5, VII
- B.           Design and implement exploratory curriculum-based science activities for K-8 students. I.5, III.2, VII
- C.           Research, evaluate, and interpret earth science information and educational resources. I, III
- D.           Develop skill in observation, measurement, classification, communication, and logical inference. III, IV
- E.           Apply the scientific method in research. III.1, III.2
- F.           Develop skill in recognizing common minerals and rocks, and in interpreting the origin of earth materials. I, III.2
- G.           Develop an understanding of weathering and of the agents of erosion. I, III.2
- H.           Develop an understanding of plate tectonic processes and their roll in generating earthquakes, producing volcanism and associated igneous activity, and building mountains. I, III.2
- I.           Develop an understanding of relative and absolute dating methods, and an appreciation for the vast history of earth, the solar system, and the universe. I, III.2
- J.           Develop an understanding of ocean chemistry, morphology, processes, and the role of ocean basins in plate tectonic cycles. I, III.2
- K.           Develop an understanding of Earth' s atmosphere, including composition, circulation patterns, interaction with the ocean and solid earth. I, III.2
- L.           Develop an understanding of Earth as a body in the solar system and the universe. I, III.2
- M.           Develop an understanding of earth as a system and the interactions of living and non-living systems. I, III, IV

N. Develop skills in critical thinking. III

\*Roman numerals after course objectives reference goals of the university parallel program.

### III. Instructional Processes\*:

Students will:

1. Read and critically evaluate scientific writing, including material from the course text, earth science journals, and the Internet. *Communication Outcome, Problem Solving and Decision Making Outcomes, Technological Literacy Outcome, Information Literacy Outcome*
2. Listen to and discuss earth science information presented by the instructor, educational video, guest speakers, and peers. *Communication Outcome, Cultural Diversity and Social Adaptation Outcome*
3. Work in teams to collect data in a laboratory setting, prepare graphs and tables, summarize data, and draw conclusions using process skills that include: observation, measurement, classification, written and oral communication, and logical inference. *Personal Development Outcome, Problem Solving and Decision Making Outcome, Technological Literacy Outcome, Numerical Literacy Outcome*
4. Conduct research and write reports. *Communication Outcome, Information Literacy Outcome*
5. Design and implement curriculum-based science activities for K-8 students. *Communication Outcome, Cultural Diversity, Problem Solving and Decision Making Outcome, Technological Literacy Outcome, Information Literacy Outcome*
6. Collect, read, and evaluate earth science related information on the Internet. *Personal Development Outcome, Technological Literacy Outcome, Information Literacy Outcome*

\*Strategies and outcomes listed after instructional processes reference Pellissippi State' s goals for strengthening general education knowledge and skills, connecting coursework to experiences beyond the classroom, and encouraging students to take active and responsible roles in the educational process.

### IV. Expectations for Student Performance\*:

Upon successful completion of this course, the student should be able to:

1. Design and conduct K-8 science activities. B, C, D, E, F  
Collect earth science information and science education resources on the Internet. D, E, F
2. Evaluate earth science information obtained from print sources, video, and television. D, E, F
3. Know current State of Tennessee science curriculum standards. A
4. Explain and use the scientific method of inquiry. E

\*Letters after performance expectations reference the course objectives listed above.

### V. Evaluation:

A. Testing Procedures: Written Tests: 600 points

Lecture material will be evaluated using five tests totaling 400 points.

Final 200 point exam is comprehensive.

B. Laboratory Expectations: 400 points

Two student developed earth science activities – 100 points

Eleven laboratory reports, 11 points each, total – 121 points

Two laboratory tests - 90 points each, total – 180 points

C. Field Work:

N/A

D. Other Evaluation Methods:

Optional (extra credit) Activities Outside of Classroom: 100 points maximum

**VI. Policies:**

Attendance Policy:

Pellissippi State Technical Community College expects students to attend all scheduled instructional activities. As a minimum, students in all courses must be present for at least 75 percent of their scheduled class and laboratory meetings in order to receive credit for the course.