

Reedley College
GEOL - 9: Introduction to Earth Science
Fall, 2019

Instructor: Dustin White
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COURSE INFORMATION

Credit: 4
Lecture Hours and Location: M, W 1:00PM - 2:15PM, POR 3
Laboratory Hours and Location: M, W 2:30PM - 3:20PM, CCI 200

Course Description: This course is an introduction to the earth sciences with an emphasis on basic topics and principles in geology. The major concepts of oceanography, hydrology, meteorology, and astronomy are also examined in detail. This course may be used for the transfer degree in Liberal Studies. ADVISORIES: Eligibility for English 1A and Mathematics 201. (A, CSU-GE, UC, I).

Important Deadlines:

Deadline to drop with refund – end of 2nd week (8/23/2019)
Deadline to drop **without** ‘W’ and to add course – end of 3rd week (8/30/2019)
Deadline to drop **with** a ‘W’ - end of 9th week (10/11/2019)

Course Objectives:

1. Explain the scientific method and apply it to earth science studies.
2. Identify the major Earth systems, including plate tectonics, geologic structures, mountain building, seismic activity and volcanoes, and describe their significant interactions.
3. Identify common minerals and igneous, sedimentary and metamorphic rocks that make up the earth’s surface and know the importance of various minerals and rocks to humans.
4. Summarize the rock cycle and explain the major processes involved in rock formation.
5. Describe the major processes that create and modify the Earth's landforms, including erosion and soil formation.
6. Summarize the hydrologic cycle and explain the major processes involved in the movement of water, including surface water, ground water, glaciers and deserts.
7. Identify the earth’s resources and determine if each of the resources is renewable or nonrenewable.
8. Describe the theory of plate tectonics and the evidence for the theory.
9. Classify the major types of plate interactions and list examples of each type.
10. Describe how volcanoes and earthquakes are formed and identify where they occur relative to plate tectonics.

11. Use triangulation to explain how earthquake epicenters are located and use seismic waves to determine distance from an earthquake.
12. Summarize the major geological principles and be use to determine the geologic history of a landscape.
13. Describe the concept of geologic time and how the geologic time scale was developed.
14. Compare relative and absolute dating, fossils and fossilization.
15. Recognize and explain the topography of the sea floor and describe ocean currents, tides and shorelines
16. Describe the chemistry of seawater.
17. Recognize and explain coastal erosional and depositional processes and the landforms they produce.
18. Summarize the causes of tidal fluctuations.
19. Describe the role of the ocean in the creation and modification of weather and climate.
20. Summarize the difference between weather and climate.
21. Describe the causes of the seasonal weather cycle.
22. Describe the composition of the atmosphere and earth's atmospheric circulation patterns.
23. List and describe the major types of climate.
24. Compare current theories and evidence for the origin of the universe and the solar system.
25. Identify the major planets and explain their motion relative to the sun.
26. Describe the systematic trends in planetary composition, density, size, orbital speed, etc. within our solar system.
27. Describe stars and interstellar matter.

Student Learning Outcomes:

1. Explain and apply the scientific method to problem solving across numerous disciplines.
2. Differentiate among the major Earth systems and describe how the systems are interconnected. Earth's systems include the hydrologic cycle, rock cycle, plate tectonics cycle, solar system, geologic time, weather and climate.
3. Describe basic physical properties of minerals and rocks and use appropriate methods to identify common minerals and rocks.
4. Utilize the plate tectonics theory to explain the distribution of Earth's major topographic features and the distribution of volcanoes and seismic activity.
5. Describe the forces and processes that shape the earth's surface and their affects over geologic time.
6. Describe and explain the controls of Earth's weather and climate.
7. Demonstrate a fundamental understanding of the significant role played by oceans in controlling Earth's weather, climate, and biological systems.
8. Be able to explain and critique theories for the origin of the solar system and the universe.
9. Communicate complex course concepts effectively in writing and diagrams.

Required Textbooks:

- **Earth Science**, 15th Edition (14th Ed is okay); by Tarbuck, E. J., Lutgens, F. K., Tasa, D. G., Tasa, D., 2019, from Pearson Education, Inc., ISBN-10: 0-134-54353-X or ISBN-13: 978-0-134-54353-6 (rentals are available)
- **Applications and Investigations in Earth Science**, 9th Edition; by Tarbuck, E. J., Lutgens, F. K., Tasa, D. G., Tasa, D., 2019, from Pearson Education, Inc., ISBN 10 : 0-13-474624-4 or ISBN 13: 978-0-13-474624-1 (rentals are available)

These books or eTextbooks can be bought or rented are: www.amazon.com, www.ecampus.com, www.vitalsource.com, or www.chegg.com as well as others not listed. Browse these sites to find what fits your needs best.

Basis for Course Grade:

| | |
|---------------------|-----------|
| 5% Homework | A 90-100% |
| 35% Labs | B 80-89% |
| 5% Research Project | C 70-79% |
| 40% Unit Tests | D 60-69% |
| <u>15% Final</u> | F < 60% |
| 100% Total | |

Attendance Policy:

Attendance at lectures and lab sessions is required and counted for every session. Students who have the perfect attendance will get 2% extra points to total grade. If you are absent from class, it is your responsibility to check on announcements made while you were away. Students who are truly interested in learning will read the chapter and come to class ON TIME and ask questions, and those who have truly learned will be able to answer questions put to them during class and exams. Furthermore, any student(s) who misses the first two days of class or misses 3 consecutive days without contacting the instructor will be dropped from the class.

Homework:

The main purpose of homework is not to create busy work, yet instead they are designed to help students focus on core concepts. These assignments can range from questions from the book to assigned readings. Students who complete these assignments usually do better on the tests. Homework will be assigned each week and are due one week after assignment date.

Labs:

Lab is designed to help students evolve from memorized information to actual understanding of the concepts, theory, and practice. Lab will focus on field aspects of geology, oceanography, meteorology, astronomy, experimentation, and questions sets designed to broaden the understanding of Earth Science. Contents of labs will follow the lecture. Labs are due one week prior to receiving them.

Research Project:

The research project is an exercise in which the student must demonstrate their ability to create an Earth Science lab along with a demonstration. The subject is open to anything pertaining to Earth Science. Review the course schedule or your textbook chapters for content and to help generate ideas.

Teaching and Exams Methods:

Lectures and laboratory classes are the major means of teaching. Emphasis will be on the lab exercises. The examination will be composed of short questions and major questions with the emphasis on the concepts, theory, and practice. Late work is NOT accepted and tests and exams cannot be taken at a later date!

Recommended Materials:

For this course you will need a scientific calculator (such as a TI 30), #2 pencil or HB lead for mechanical pencils, eraser, six 882E scantrons (unless summative assessment is administered through Canvas), ruler, and protractor. Most of these can be purchased at the Bookstore or ordered online through providers such as Amazon. If there is a problem getting these materials, please speak to your instructor to make special arrangements.

Canceled Classes: If class is canceled, it will be announced to the students through Canvas. Please make sure to check for announcements before you leave for class. I will make my best effort to contact everyone promptly if class is canceled.

GEOL-9: Introduction To Earth Science, Tentative Schedule

| Week | Date | Contents | | Ch. |
|------|-------|---|---|-----|
| 1 | 8/12 | Welcome and Introduction to Earth Science | Lab 0: Basic Skills | 1 |
| | 8/14 | Geology- Earth's Materials | Lab 1: Minerals | 2 |
| 2 | 8/19 | Geology- Earth's Materials | Lab 1: Minerals | 3 |
| | 8/21 | Geology- Earth's Materials | Lab 2: Rocks and the Rock Cycle | |
| 3 | 8/26 | Unit 1 Test - Earth Materials | | 4 |
| | 8/28 | Geology- Tectonics | Lab 3: Plate Tectonics | |
| 4 | 9/2 | <i>Labor Day - September 2 - no classes</i> | | |
| | 9/4 | Geology- Earthquakes and Earth's Interior | Lab 4: Earthquakes and Earth's Interior | 5 |
| 5 | 9/9 | Geology- Volcanism | Lab 5: Volcanism and Volcanic Hazards | 6 |
| | 9/11 | Geology- Crustal Deformation and Mountain Building | Lab 6: Geologic Maps, Block Diagrams, and Rock Structures | 7 |
| 6 | 9/16 | Unit 2 Test - Forces Within | | 8 |
| | 9/18 | Geology- Weathering, Soil, and Mass Movement | Lab 7: Aerial Photographs, Satellite Images, and Topographic Maps | |
| 7 | 9/23 | Geology- Running Water and Groundwater | Lab 8: Shaping Earth's Surface: Running Water and Groundwater | 9 |
| | 9/25 | Geology- Glaciers, Deserts, and wind | Lab 9: Shaping Earth's Surface: Arid and Glacial Landscapes | 10 |
| 8 | 9/30 | Geology- Geologic Time | Lab 10: Geologic Time | 11 |
| | 10/2 | Geology- Evolution of Earth | Lab 10: Geologic Time | 12 |
| 9 | 10/7 | Units 3 & 4 Test - Earth's Surface and History | | 13 |
| | 10/9 | Oceanography- The Ocean Floor | Lab 11: Introduction to Oceanography | |
| 10 | 10/14 | Oceanography- Ocean Water and Ocean Life | Lab 12: Waves, Currents, and Tides | 14 |
| | 10/16 | Oceanography- The Dynamic Ocean | Lab 13: Earth-Sun Relationships | 15 |
| 11 | 10/21 | Unit 5 Test - Oceanography | | 16 |
| | 10/23 | Meteorology- Earth's Atmosphere | Lab 14: Heating the Atmosphere | |
| 12 | 10/28 | Meteorology- Moisture, Clouds, and Precipitation | Lab 15: Atmospheric Moisture, Pressure, and Wind | 17 |
| | 10/30 | Meteorology- Air Pressure and Wind | Lab 16: Air Masses, Midlatitude Cyclones, and Weather Maps | 18 |
| 13 | 11/4 | Meteorology- Weather Patterns and Severe Storms | Lab 17: Global Climates | 19 |
| | 11/6 | Meteorology- Climates and Global Climate Change | Lab 18: Astronomical Observations | 20 |
| 14 | 11/11 | <i>Vetans Day - November 11 - no classes</i> | | |
| | 11/13 | Unit 6 Test - Meteorology | | |
| 15 | 11/18 | Astronomy- Origins of Modern Astronomy | Lab 19: Patterns in the Solar System | 21 |
| | 11/20 | Astronomy- Our Solar System | Lab 20: Locating the Planets | 22 |
| 16 | 11/25 | <i>Thanksgiving Break - November (25-29)</i> | | |
| | 11/27 | <i>no classes</i> | | |
| 17 | 12/2 | Astronomy- Lights, Telescopes, and the Sun | Lab 21: Examining the Terrestrial Planets | 23 |
| | 12/4 | Astronomy- Beyond Our Solar System | Lab 22: Motions of the Earth-Moon System | 24 |
| 18 | 12/9 | Finals Week- December (9-13) | | |
| | 12/11 | Comprehensive Final Exam | | |
| | | | Exam scheduled for 12/9 From 1-2:50PM | |

ADMINISTRATION:

Disability Notice: If you have special needs as addressed by the American with Disabilities Act (ADA) and need course materials in alternative formats, notify your course instructor immediately. Reasonable efforts will be made to accommodate your special needs.

Cheating and Plagiarism Notice: Please refer to the Reedley College Catalog section titled Administrative Policies for Policy on Cheating and Plagiarism. All work must be completed independently. Copying work from others without putting in any substantial individual effort constitutes plagiarism, which will be subject to disciplinary actions in accordance with policy.

Classroom etiquette: Please set your cell phones vibrate or silent during classes. Please use them for emergency purposes only. If you must talk or text on your phone, please first leave the classroom quietly without causing any disruption.

Subject-to-change notice: This syllabus and the class schedule are subject to change in the events of extenuating circumstances. If you are absent from class, it is your responsibility to check on announcements made while you were absent. Any substantive changes to this syllabus will be accompanied by the distribution of a revised syllabus