# Reedley College

GEOL- 9-58894- 2023SU:
Introduction to Earth Science **Summer 2023**

Instructor: Dr. Robert Davies
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**COURSE INFORMATION**

Credit: 4
Lecture Hours and Location:
Laboratory Hours and Location:

This course is 100% Online, asynchronous; there are no defined meeting times or locations. All content is via recorded lectures, activities, and discussions. Office hours are Thursdays from 3PM to 5 PM, on Zoom. Link is provided in Canvas Shell.

**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:**
**July 1 Deadline to apply for graduation for Summer 2023 completion**
Holidays: No Work will be due on Holidays, and due dates will be extended an additional day during holiday weeks.
June 19- Juneteenth
July 4 - Independence day

**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, groundwater, 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.

**Textbooks:**

- The Good Earth: Introduction to Earth Science, 5th Edition

- ISBN10: 1260364127 | ISBN13: 9781260364125; By David McConnell, David Steer, Katharine Owens, Catherine Knight and Lisa Park, © 2021

- ***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: 978-0-13-4746. I suggest using a digital copy only if you are confident of your editing ability. A paper book will work as well.

The Good Earth is part of an online book package that includes Online homework through the Connect Platform. Access is obtained through the Canvas link.

**Basis for Course Grade:**

| | | |
|---|---|---|
| 10% Discussion Board | **90-100** | **A** |
| 50% Online / at home Lab Assignments | **80-89.9** | **B** |
| 20% Assessments and Quizzes | **70-79.9** | **C** |
| 20% Homework and Assignments | **60-69.9** | **D** |
| **100% Total** | **0-59.9** | **F** |

**Attendance Policy:**
Attendance is all on line; I will check Canvas for information on page views and participation and time spent from students to gauge attendance. Discussions are an integral part of attendance and maintaining regular effective contact with the students. As such, participation in discussions counts for 10% of your grade.

**Homework:**
The Connect on line system will have homework for each chapter. Homework is a way to reinforce chapter and lecture material, and a way to gauge participation. Homework is usually due one week from time of assignment. I accept late work, uo to one week late, than the assignment is closed.

**Labs:**
Lab is all home based; most of the activities are workbook based, but some have been modified through video demonstrations to account for experimental set ups. Home experiments will be assigned, using free or inexpensive materials, easily found. In conducting a home experiment, I will be looking for the activity and the creativity of the project. My motto is " Do the best you can with what you have, and make an honest report of it".

**Exams and Assessments:**

Quizzes are lower stakes and are for building knowledge and reinforcement of topics- sometimes there will be multiple attempts allowed. Exams and assessments are higher stakes, and will have one attempt, and a time limit- contact me if you need accommodations.

## GEOL - 9: Introduction To Earth Science, Tentative Schedule

| Week | Date | Unit | Lecture Content | Lab Content | Ch |
|---|---|---|---|---|---|
| 1 | 3 WEEKS | Unit 1: Rocks & Minerals | Welcome and Introduction to Earth Science | Lab 0: Basic Skills | 1 |
| 2 | | | *(M, 1/17 Martin Luther King Jr Day)*<br>Geology- Earth's Materials - Minerals | Lab 1: Minerals | 2 |
| 3 | | | Geology- Earth's Materials - Rocks<br>**Unit 1 Test - Earth Materials** | Lab 2: Rocks and the Rock Cycle | 3 |
| 4 | 2 WEEKS | Unit 2: Forces Within | Geology- Plate Tectonics<br>Geology- Earthquakes and Earth's Interior | Lab 3: Plate Tectonics<br>Lab 4: Earthquakes and Earth's Interior | 4<br>5 |
| 5 | | | *(M, 2/21 Washington Day)* Geology- Volcanism<br>**Unit 2 Test - Forces Within** | Lab 5: Volcanism and Volcanic Hazards<br>Lab 6 - Skip | 6 |
| 6 | 3 WEEKS | Units 3&4: Earth's Surface & History | Geology- Weathering, Soil, and Mass Movement<br>Geology- Running Water and Groundwater | Lab 7: Aerial Photographs, Satellite Images, and Topographic Maps<br>Lab 8: Shaping Earth's Surface: Running Water and Groundwater | 8<br>9 |
| 7 | | | Geology- Glaciers, Deserts, and Wind | Lab 9: Shaping Earth's Surface: Arid and Glacial Landscapes | 10 |
| 8 | | | Geology- Geologic Time<br>**Units 3 & 4 Test - Earth's Surface and History** | Lab 10: Geologic Time: Relative and Numerical Time | 11 |
| 9 | 2 WEEKS | Unit 5: Oceanography | Oceanography- The Ocean Floor<br>Oceanography- Ocean Water and Ocean Life | Lab 11: Introduction to Oceanography | 13<br>14 |
| 10 | | | Oceanography- The Dynamic Ocean<br>**Unit 5 Test - Oceanography** | Lab 12: Waves, Currents, and Tides<br>Lab 13 - Skip | 15 |
| 11 | 5 WEEKS | Unit 6: Meteorology | Meteorology- Earth's Atmosphere | Lab 14: Heating the Atmosphere | 16 |
| 12 | | | Meteorology- Moisture, Clouds, and Precipitation | Lab 15: Atmospheric Moisture, Pressure, and Wind | 17 |
| 13 | | | Meteorology- Air Pressure and Wind<br>Meteorology- Weather Patterns and Severe Storms | Lab 16: Air Masses, Midlatitude Cyclones, and Weather Maps | 18<br>19 |
| 14 | | | *Spring Recess - April 11th -15th* | *NO Instruction This Week* | |
| 15 | | | Meteorology- Climates and Global Climate Change<br>**Unit 6 Test - Meteorology** | Lab 17: Global Climates<br>Lab 18 - Skip | 20 |
| 16 | 3 WEEKS | Unit 7: Astronomy | Astronomy- Origins of Modern Astronomy<br>Astronomy- Our Solar System | Lab 19: Patterns in the Solar System<br>Lab 20: Locating the Planets | 21<br>22 |
| 17 | | | Astronomy- Lights, Telescopes, and the Sun | Lab 21: Examining the Terrestrial Planets | 23 |
| 18 | | | Astronomy- Beyond Our Solar System | Lab 22: Motions of the Earth–Moon System | 24 |
| 19 | 5/16 to 5/20 | | **Finals Week- May 16th - 20th**<br>**Comprehensive Final Exam** | **Final Exam - Thursday, May 19th** | |

**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