"Moonride" at the Imperial Sand Dunes

PLEASE NOTE: ONCE YOU HAVE READ THROUGH THE SYLLABUS HERE, ALL YOU HAVE TO DO IS GO BACK TO THE 'HOME' PAGE - EVERYTHING IS LINKED TO THE BUTTONS ON THE HOME PAGE (SO YOU DON'T HAVE TO GO TO ASSIGNMENTS OR QUIZZES, FOR EXAMPLE, BECAUSE THEY ARE ALREADY LINKED TO BUTTONS WHICH OPEN UP THE WEEKLY 'MODULES' THAT CONTAIN ALL OF YOUR TASKS FOR EACH WEEK)...THE ONLY OTHER LINK YOU WILL USE FREQUENTLY IS 'ANNOUNCEMENTS'.

YOU CAN GET TO THE 'HOME' PAGE HERE: HOME PAGE OR AT THE TOP OF THE COLUMN TO THE LEFT.

Geology 100 is an introductory course providing non-science majors a broad background in geology. No previous science background required.

This course introduces the following themes:

- Scientific models
- Scientific literacy
- Science is observable
- Earth's interior and materials
- Geologic (deep) time
- Plate tectonics and connections to seismicity and mountains/volcanoes
- Global connections and change
- Personal connections to geologic features/processes
- Oceans/Coastlines and extreme environments
- Energy resources
- Topographic maps

Basic Course Information

Semester	Spring 2025	Instructor Name	Kevin Marty

Course Title & #	Geology 100 (Physical Geology)	Email	kevin.marty@imperial.edu
CRN #	20040, 20041, 21257	Webpage (optional)	
Room	20040 (face-to-face Th 11:20-2:30pm Room 2733 and lecture online); 21257 (face-to-face T 11:20-2:30 pm and lecture online); 20041 (face-to-face, M,W 11:20-2:30; Room 2733)	Office	Room 2776 upstairs in Science Department
Class Dates	Feb 10 - June 6	Office Hrs: T,Th: 8:30-9:30 am and W: 10:15-11:15 pm	TBA
Class Days	CRN:20040 Th CRN: 21257 T CRN:20041 M,W	Office Phone #	760-355-5761
Class Times Units	CRN:20040 on Th from 11:20-2:30 pm CRN: 21257 on T from 11:20-2:30 pm CRN:20041 on T,Th from 11:20-2:30 pm Units 4	Science Dept office contact	Science Dept at 760-355-6155

I) **CRN's 20040 and 21257 (face-to-face and online);** your meetings will be in room 2733, the Geology Lab, as follows:

Thursday (lab): from 11:20-2:30 for CRN 20040

Tuesday (lab): from 11:20-2:30 pm for CRN 21257

Lectures are fully online: no required lecture meetings for CRNs 20040 and 21257.

II) **for CRN 20041 (face-to-face);** your meetings will be in room 2733, the Geology Lab, as follows:

Monday (lectures): from 11:20-2:40 pm.

Wednesday (labs): from 11:20-2:40 pm.

Course Description

This course is designed as an introduction to Earth's physical processes, structures, and composition, and includes coverage of Earth's internal processes, such as those that cause earthquakes, volcanoes and mountain building; surface processes, such as rivers and waves, wind, glaciers and the landforms that result from these processes; the nature and origin of rocks and minerals that form the Earth's crust; and structures related to folding and faulting, will be studied. (C-ID GEOL 101) (CSU, UC)

(More)

The Earth is diverse and dynamic, featuring volcanoes, earthquakes, tsunamis, landslides, floods, and so on. As citizens, we want to understand what is going on in our natural world and which aspects directly affect us or are most interesting. Understanding past events helps us comprehend what has happened and begin to predict future events. With the Earth, we examine past events and current natural processes to understand how this past and these processes affect humans. Accordingly, this course examines the processes and materials composing Earth's physical environment, for example, its landscapes and interior. We will explore topics such as natural hazards and disasters, fossils, energy resources, and much more. To do so, we will learn some underlying principles of the natural world, from small things like the very building blocks of matter (atoms), to large things, like the cause and effect of regional forces that build mountains (e.g., the Himalayas) and make new oceans (e.g., the Red Sea). These processes are active today on Earth, and give rise to earthquakes, volcanoes, and landslides, all of which obviously affect humans. The class will meet generally twice per week (once for lecture; once for lab) over a 16 week-long semester. This course is taught using a hybrid approach, partly as a normal lecture in the classroom during our normal meeting time, and partly as an online course, which you do on your own outside of class. During this time outside of class, you are required to complete online quizzes and investigations assigned for that week.

Student Learning Outcomes

Upon course completion, the successful student will have acquired new skills, knowledge, and or attitudes as demonstrated by being able to:

1. Gain awareness of geological events on a global scale and understand/evaluate why events/features occur where they do. Assessment done through tracking earthquake and volcanic eruptions events and building on knowledge of plate tectonics. (ILO5)

2 . Gain critical thinking ability/skills through observations and applying scientific inquiry to understand geologic features and processes. Understand and use principles of the scientific method. (ILO2)

3. Develop oral and written skills through various labs, research papers and presentations. (ILO1)

4. Gain knowledge of geologic history, features and processes through lectures, research papers, exams and labs. (ILO4)

Course Objectives

Upon satisfactory completion of the course, students will be able to:

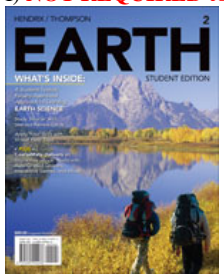
1. Explain the basic divisions of the earth, their compositions, and their role in plate tectonics
2. Discuss physical properties used to identify common minerals.
3. Demonstrate an understanding of Bowen's Reaction Series and the mineralogy of magma.
4. Describe the relationship between cooling rates and mineral crystal sizes in igneous rocks.
5. Describe the processes and pathways of the Rock Cycle.
6. Describe types of volcanoes, lava viscosity and compositions and their relation to plate tectonics and volcanic activity.
7. Give a basic explanation of the effects of physical and chemical weathering.
8. Explain how sedimentary rock composition, textures, sedimentary structures and fossils indicate specific environments of deposition.
9. Discuss the process and grades of metamorphism.
10. Demonstrate an understanding of the earth's history as related to the fossil record and to geologic time.
11. Construct models illustrating how basic geologic principles relate to the juxtaposition of rock structures.
12. Relate the concepts of plate tectonics to seismology, the Rock Cycle, and structural geology.
13. Explain the relationship between sea-floor physiographic features, sea floor core data, sediments, and paleomagnetics as supportive evidence for plate behavior.
14. Recognize the types of plate boundaries and explain their relationship to crustal movement and mountain building.
15. Demonstrate an understanding of stream dynamics with regard to the transport and deposition of sediments.*
16. Identify major surface landform features and relate them to the geologic agents that formed them, including stream, ground water, glacial, and marine processes.
17. Demonstrate a knowledge of crustal deformation and recognition of geologic faults and structures.
18. Discuss Earth's natural resources.
19. Describe the possible causes of an Ice Age.
20. Explain groundwater pollution problems.*

*not currently scheduled

Textbooks & Other Resources or Links

This class recently (since fall of 2020) switched to OER (online educational resources) for textbook and lab book resources; so there is no textbook costs and the material is provided within the 'modules' section of this course (link to 'modules' in column to left). I have provided two resources that I am using for this course (but again; you don't need to purchase these, they are just for your information).

I) **NOT REQUIRED to Purchase**



EARTH2 , 2nd Edition

Marc Hendrix; Graham R. Thompson
ISBN-10: 1-285-44226-1
ISBN-13: 978-1-285-44226-6

II) **NOT REQUIRED to Purchase**

Laboratory Manual, Introductory Geology, Deline, Bradley; Harris, Randa; and Tefend, Karen.

Anticipated Weekly Schedule for Spring 2024

Week of:	Module/Topic	Task
Feb 10-16 (Lesson 1)	**Lecture** 1: Ch 1 Intro to Geology (Deline) **Lab**: No Lab ***Journal Entries and eARTh show discussed (entries due throughout semester; eARTh show during final's week)***	**Lecture**:Reading, Introductory Post, Scientific Method Assignment (Lewis and Clark OR Megaflood Post); Reading quiz due next week **Lab**: No Lab
Feb 17-23 (Lesson 2; Lab 1)	**Lecture** 2: Ch 1 Earth Systems (Thompson) **Lab** 1: Ch 2 Earth's Interior (Deline)	**Lecture**: Reading, Quiz Earth Systems **Lab**: Exercises Part's A and C comprehension quiz
Feb 24-Mar 2 (Lesson 3; Lab 2)	**Lecture** 3: Ch 6 Plate Tectonics (Thompson) **Lab** 2: Ch 6 Plate Tectonics (Thompson)	**Lecture**: Reading, Videos, Self Check **Lab**: Lab Assessments (Review Questions)
Mar 3-9 (Lesson 4; Lab 3)	**Lecture** 4: Ch 7 Earthquakes (Thompson)	**Lecture**: Reading, Videos, Self-check Quiz

	Lab 3: Earthquakes (Thompson)	**Lab**: Lab Assessments Part 1 and Part 2
Mar 10-16 (Lesson 5 Part I) and (Lesson 5 Part II; Lab 4)	**Lecture** 5 Part I: Ch 9 Mountains (Thompson) **Lab** 4 Part II: Volcanoes (Thompson)	**Lecture**: Read, Video, Self-check quiz **Lab**: Lab Assessment (quiz) part's C,D,E)
Mar 17-23	**(JOURNAL WRITING AND eARTh show)**	**Test 1 (CANCELLED)**
Mar 24-30 (Lab 3 continued- Plate Tectonics)	**Concord Website**	**Concord Website**
Mar 31-Apr 6 (Lesson 6; Lab 5)	**Lecture** 6: Ch 2 Minerals (Thompson) **Lab** 5: Minerals (Thompson) with mineral samples and test kit	**Lecture**: Video, Reading, Self-check Quiz **Lab**: Mineral ID, Lab Assessment
Apr 7-20 (**over two weeks**) (Lesson 7; Lab 6)	**Lecture** 7: Ch 3 Rocks (Thompson); Ch 8 (partial) Volcanoes/Plutons (Thompson); and Ch 10 (partial) Weathering, Soil and Erosion (Thompson) **Lab** 6: Rocks (Thompson) with rock samples	**Lecture**: Reading, Video, Self-check Quizzes **Lab**: Lab Assessment, Rock ID
Apr 21-27	**Spring Break**	**Spring Break**
Apr 28-May 4 (Lesson 8; Lab 7)	**Lecture** 8: Ch 4 Geologic Time (Thompson); **Lab** 7: Geologic Time (Thompson)	**Lecture**: Reading, Three Videos, Three Self-check Quizzes **Lab**: Rock ID, Lab Assessment #3.1 and #3.2
May 5-11	**(Life Core...and JOURNAL ENTRIES/eARTh SHOW if needed)**	**Test 2: (CANCELLED)**
May 12-18 (Lesson 9; Lab 8)	**Lecture** 9 **Part I**: Ch 16 Oceans and Coastlines (Thompson) **Lab** 8 **Part II**: Ch 15 Oceans and Coastlines (Thompson)	**Lecture**: Reading, Videos, Self-check quiz, Review Questions Ch 16 **Lab**: Lab Assessment

May 19-25 (Lesson 10; Lab 9	**Lecture** 10: Chapter 3 (Deline) **Lab** 9: Topographic Maps (Deline)	**Lecture:** Reading **Lab:** Lab Assignment
May 26-June 1 (Lesson 11)	**Lecture** 11 **Part I and II:** Ch 13 Glaciers and Glaciation (Thompson) Ch 14 Deserts and Wind (Thompson) **Lab** 10: Deserts and Glaciers Review Questions	**Lecture:** Reading, Review Questions
June 2-6	eARTh SHOW!! Geology of National Parks Essay **Due Dec 6 (extra credit this semester)**	Final's Week