

UNIVERSITY OF SAN DIEGO
ENVIRONMENTAL AND OCEAN SCIENCES
EOSC110: INTRODUCTION TO GEOSCIENCES/ FALL 2019
T/TH 10:45-12:05 & Thursday/Friday 2:30-5:20

LECTURE INSTRUCTOR: Elizabeth (Liz) Baker Treloar

- **office:** Shiley Science and Technology Center, #264.
- **voicemail:** 619-260-6822
- **email:** ebaker @ sandiego.edu
- **office hours:** Mon.: 1:00-2:00 ; Wed.: 1:00-4:00; Friday: 1:30-2:30 and by appointment

LAB INSTRUCTORS:

Thursday Lab(sec. 1): Liz Baker Treloar
see above

Friday Lab(sec. 2): Ray Rector

- **office:** SCST 262 (the lab)
- **email:** geoprof@geoscirocks.com / **Website:** www.geoscirocks.com
- **office hours:** Friday: 1:30-2:30 and by appointment

TEXTBOOKS:

Lecture(highly recommended)

- Earth: An Introduction to Physical Geology, Tarbuck & Lutgens, Pearson 12th ed. **See Blackboard for eBook instructions.**

Lab(required)

- Custom Lab manual by Pearson, "Introduction to Geosciences". **USD Bookstore only**
- USD Course Materials by Baker Treloar, referred to as the "Reader" in class. **USD bookstore only**

MAJOR AND CORE INFORMATION:

EOSC110 is an introductory course in Geoscience designed as a preparation course for the Environmental and Ocean Sciences majors and minors. EOSC110 will also fulfill the Core Curriculum Explorations Science and Technological Inquiry requirement, and the Core Curriculum Quantitative Reasoning competency for all majors.

COURSE DESCRIPTION:

The objective of this course is to give students an introduction to planet Earth and the physical processes that operate inside solid Earth and on the surface. The geosphere (solid Earth) will be the focus, however, the atmosphere and hydrosphere are a critical connection. The course will conclude with a brief overview of Earth History with an emphasis on the physical processes and conditions that affected the evolution of life on this planet. Students will learn the study of planet Earth requires an interdisciplinary approach, and the geosciences have never been more critical to society than they are today; there is a growing demand for natural resources as well as solutions to mitigating the impacts of natural hazards and climate change.

COURSE LEARNING OUTCOMES (LECTURE AND LAB COMBINED)

The course learning outcomes are divided into two key components; KNOWLEDGE and SKILLS. **Knowledge refers to the geoscience content** base that you will develop as you learn about the fundamental concepts of geoscience. These knowledge or content learning outcomes include:

Geoscience Learning Outcomes

You will achieve an understanding of the fundamental principles of physical and historical Geology, and a conceptual understanding of the process of scientific inquiry.

- *Identify Earth materials (mineral and rocks) and connect them to the processes that play a role in their formation.*
- *Describe the internal structure of Earth, and the processes that modify Earth's surface.*
- *Discuss the geological processes and features related to plate tectonic activity.*
- *List and discuss some significant historical geologic events that affected life on planet Earth.*
- *Understand the interconnectedness of Earth's spheres by describing the rock, plate tectonic, and hydrologic cycles.*
- *Acquire basic skills of observation, measurements, and problem solving in lab and field settings.*

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Skills refer to the scientific ‘habits of mind’, or skill set, frequently used by earth scientists. Some of these scientific skills are numeracy and math skills (i.e., quantitative reasoning), analysis of spatial and temporal scales, estimation of uncertainty, and data analysis and interpretation. The learning outcomes for Quantitative Reasoning in [USD’s Core Curriculum](#) will thus be met by taking this course:

Quantitative Reasoning (CQR) Learning Outcomes

- **Identification:** Recognize and select quantitative information that is relevant to the argument (e.g., extract necessary data from larger datasets that may also contain non-relevant information).
- **Calculation and Organization:** Perform any necessary calculations (e.g., converting units, standardizing rates, applying formulas, solving equations), and put data into comparable forms (e.g. graphs, diagrams, tables, words).
- **Interpretation:** Interpret and explain data in mathematical forms, such as analyzing trends in graphs and making reasonable predictions about what the data suggest about future events.
- **Evaluate Assumptions and Recognize Limitations:** Make and evaluate important assumptions in estimating, modeling, and analysis of quantitative data as well as recognizing their limitations.
- **Justification:** Communicate carefully qualified conclusions and express quantitative evidence to support arguments.

We will also use these skills in the process of scientific inquiry. Hence, the learning outcomes for ESTI in the Core are:

Scientific and Technological Inquiry (ESTI) Learning Outcomes

- Design and conduct an experimental and/or observational investigation to generate scientific knowledge or a technological solution to a problem.
- Analyze data using methods appropriate to the natural sciences and/or engineering in order to make valid and reliable interpretations.
- Explain the basic scientific concepts and theories relevant to the area of study.
- Identify and use appropriate and sufficient scientific evidence to evaluate claims and explanations about the natural and designed world.

COURSE REQUIREMENTS AND POLICIES: PLEASE BE FAMILIAR WITH THE FOLLOWING

- Regular **attendance** and being **attentive** are critical to your understanding of the subject matter, and will improve your performance on the exams. As an introductory class, there is a tremendous amount of information and new terminology. **Emphasis will be on integration of terms and concepts, focusing on critical thinking;** it never works well to memorize ‘mechanically’, it is important to **understand the material**.
- **In class exercises will be collected occasionally for attendance.**
- **Check your email and Blackboard:** announcements and important information about the course will be posted on Blackboard.
- Lecture power point slides (posted after lecture), study guides, animations, links to websites, assignments, and additional reading will be available **on Blackboard**. Grades will not be posted on blackboard.
- **FIELD TRIPS:** The field trips are an essential component of the course. Reading a text or writing a paper cannot replace what you learn in the field.

Mandatory field trip outside of class or lab time:

- The desert field trips **Saturday Nov. 16 to Sunday Nov.17**. We will leave from the Science Building around 7:30AM Sat. and return Sun. ~ 4:00PM. Food, water, and transportation will be provided. No one is allowed to drive their own vehicle.
- **Conflicts due to participation in sports events are not valid. If you are unable to attend due to a critical emergency, valid documentation of the emergency must be presented.** If a student **misses** the field trip **without a valid reason**, the final grade for the lab section of the course will be dropped one whole grade (e.g. from a B to a C).
- NO alcohol or illegal drugs are permitted on the field trips. Possession or use of illegal drugs or alcohol on the field trips will be considered a violation of academic integrity.
- **EXAMS** will cover course material presented in lecture, the desert field trip, and any additional information posted on Blackboard (you will be notified in class). The lecture text, Earth: Introduction to Physical Geology, is an excellent resource to supplement lectures. You will not be expected to know information from the text if it is not covered in class. Each exam/quiz is comprehensive and covers material prior to the exam date, however, will focus on the more recent material.
 - To **make up an exam or a quiz**, you must have **valid documentation** of an illness or emergency, or by prior arrangement. Without a valid excuse or prior arrangement, you will not be allowed to make up an exam or quiz.
 - Exam questions will be partially scantron style (multiple choice, matching, and T/F) and partially fill in blank and short answer.
 - Exam scores will be available on scantron returned in lecture.

- **RESPECT** your instructors and fellow students:
 - PLEASE TURN SOUND OFF ON **PHONES** AND **PUT AWAY** (off desks and laps) DURING LECTURE AND EXAMS. Points will be deducted (each time) **if you refuse to take this seriously.**
 - **NO** electronic devices (laptops, pads, etc.) for taking notes.
 - **Please do not make a habit of excusing yourself in the middle of lecture** or arriving late.
- Please **communicate** any concerns or special needs in a timely manner.
- **Academic Integrity:** You are responsible to have read and fully understand the meaning and expectations of academic integrity. Any suspected violations of academic integrity will be referred to the Dean of Arts and Sciences and may result in a failing grade for the course. Please review the Academic Integrity Policy, which can be found in the University's Policy and Procedure Manual, this is available as a PDF file: <https://www.sandiego.edu/conduct/documents/HonorCode.pdf>
- **Most important**, take advantage of this opportunity to learn some relevant and very interesting science, and enjoy the course!

LAB POLICIES

- All lab and take-home assignments are due at scheduled time.
- Excused absences require previous notification, and a doctor's verification in case of illness.
- Missing a lab without notifying the instructor with a valid reason prior to lab will result in **zero points** for the lab exercise.
- The use of cell phones and laptops is strictly forbidden during class unless authorized by the instructor.
- Exam questions will be drawn from the lab discussion (lecture) and course field trips. Questions may utilize scantron forms and may be multiple choice, short answer questions, figure or photo description, and some may require sketches or short "essay" writing.
- Attendance is both required and needed in order to succeed. Lab attendance will be recorded each lab period.
- **Pre-labs and assignments:** **Pre-lab exercises will be due before lab starts.** Take-home assignments are designed to reinforce the lab topics; it is to your advantage to individually learn and understand each lab carefully. Pay attention to when lab assignments are due.

LAB AND FIELD SAFETY:

- When an emergency happens while you are in SCST 262, do not use the elevators or the central staircase. Evacuate the building using the **west** stairway (turn to your left as you leave lab) and exit on the 1st floor. Go to the assembly area in front of the IPJ immediately and report to the instructor and/or the Emergency Personnel.
- **Always**, wear **closed-toed shoes** in lab and in the field.
- **No** food or drinks in the lab. Leave all food and drinks on table outside the entrance to lab.
- Please contact your lab instructor immediately for any safety or health issues of concern in lab or the field.

COURSE EVALUATION AND GRADING POLICY: subject to change

- **2/3 of course grade from lecture performance:**
 - 90%: Exams and Quizzes.
 - 10%: Assignments (TBA) and attendance.
 - Punctuality, participation, and attitude are considered.
 - If you decide to use your phone during lecture, points off lecture grade each time.
 - Missing lectures will negatively affect your grade.
 - **THERE ARE NO EXTRA CREDIT** assignments
- **1/3 of course grade from lab performance:**
 - 25%: Lab exercises, attendance, punctuality, participation in lab and field, and attitude.
 - 75%: Exams, quizzes, and weekend field trip assignment.
 - **THERE ARE NO EXTRA CREDIT** assignments
 - Points will be deducted (or ZERO points):
 - Lab assignments turned in late.
 - Missing lab without giving notice and valid excuse.
 - Leaving lab or the field early without completing and turning in the exercise.

- **Forgetting to bring lab manual or reader** to lab more than twice. ☹️

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- You will receive one course grade for the lecture and lab combined. The **lecture** will count for **2/3rds** of your final grade and the **lab** will count for **1/3rd** of your final grade. **You must receive a passing grade in both the lecture and the lab in order to pass the course.**
- There will be an opportunity to improve the lowest of your lecture exam 1 or 2 scores. A second exam, optional comprehensive final, will be offered in the same 2 hour final exam period with exam 3 (the final); this will replace the lowest of your exam 1 or 2 scores, if the score is higher. The optional exam will not affect your grade if it is lower than either of your exam 1 or 2 scores.
- Exams, quizzes, assignments, and course grade will be determined using the following scale:
100-90% **A to A-**; 89-80% **B+ to B-**; 79-66% **C+ to C-**; 65-55% **D+ to D-**; < 55% **F**

IF YOU WANT TO DO WELL IN THIS CLASS: please READ the following:

- Do not miss lecture.
- Pay attention and focus when you are in lecture.
- Complete the lecture notes during lecture. (circulated in class about once a week)
- **Your homework each week:**
 - After lecture (by the end of each week) read appropriate pages in text, pay attention to figures, and review lecture notes.
 - When reviewing the lecture notes and reading the text, go through the ppt lecture **again**.
- Come to office hours if you have questions.
- **Before the exam** (days!): Complete the study guide **first** on your own, this will force you to go through your notes and text AGAIN. Then get together with others in the class if you want to review and compare notes.
- The study guide is a “guide” to help you review. The questions on the study guide will encourage you to think about concepts, understand new terms, and most important, connect and see the “big picture”.
- There will be possible unannounced short quizzes to see if you are keeping up with the material and paying attention in lecture.
- You must understand processes (*plate tectonics, erosion, etc.*) and also be able to think spatially and temporally (*e.g. explain how calcium in an exposure of limestone in Utah can end up in a bivalve shell 75 million yrs. later and 1000's of km away*). This is the most challenging part about learning Geoscience. It is easy to memorize the definition to terms, however, it is essential to see how they connect by understanding geologic processes.
- Exam questions, whether they are multiple choice or short answer, will be designed to see if you have achieved the statement above.



EOSC110: LECTURE OUTLINE AND READING FOR FALL 2019
SUBJECT TO CHANGE, INCLUDES QUIZ & EXAM DATES

Week of: Tues. & Thurs.	Topic	Reading: Earth by Tarbuck, Lutgens, Tasa 12th ed. and Introduction to Geosciences Lab Manual READ RELEVANT INFORMATION
9/5 Thursday	Introduction to the Course	Earth:Ch. 1 p. 14-19; Lab manual: Ch. 1 p. 3-4
9/10	Geologic Time Earth's Origin Earth's Internal Structure (Layers) Isostasy	Earth:Ch. 1 p. 9-11; Ch. 9 p. 292-295; Ch.22 p.670 Earth:Ch. 1 p. 19-22; Ch. 24 p. 734; Ch. 22 p. 671-674 Earth: Ch. 1 p. 23-24; Ch. 12 p. 364-365 & 368-373; Earth:Ch. 14 p. 434-435; p.557; Lab manual: p. 12-13
9/17	The Geosphere Earth's Internal Heat Introduction to Plate Tectonics	Earth:Ch. 1 p. 28-32; Ch. 13 p. 390-396; Ch. 14 p. 420 Earth:Ch. 12 p. 373-377 See below
9/24	Plate Boundaries / Paleomagnetism / Hotspots	Earth:Ch. 2 p. 38-71; Ch. 12 p. 374-382; Ch. 13 p. 400-416; Ch. 14 p. 421-430; Ch. 5 p. 169-173; Lab manual: p. 124-127; 134-135
10/1	Minerals QUIZ 1:Day TBA Lecture before Igneous Rocks / Intrusive Activity	Earth:Ch. 3 p. 74-105 /Ch. 1 p. 25-27; Lab manual: p. 78-85; 95-97 Earth:Ch. 4 p. 108-122; Lab manual:p. 101-109/Ch. 4 p. 123-138
10/8 <i>Lab exam 1</i>	Sedimentary rocks and Depositional Environments	Earth:Ch. 7 p. 212-239; Lab manual: p. 110-115
10/15	Weathering and Soils EXAM 1	Earth:Ch. 6 p. 182-209 See Study guide
10/22	Tourmaline Beach Prep Volcanoes	Earth:Ch. 5p. 142-179 /Ch. 21p. 645-64
10/29	Geologic Structures (folds & faults) Faults / Earthquakes	Earth:Ch. 10p. 304-324; Ch. 14 p. 433-434; Lab manual: p. 197-204 Earth:Ch. 19 p. 577-581 / Ch. 11p. 328-361
11/5	Earthquake Hazards San Andreas Fault and S. CA Faults	Earth:Ch. 11p. 328-361 Earth:Ch. 10 p. 318-319; Ch. 14 p. 433-434
11/12	EXAM 2 Pre-Field Trip lecture (quiz after)	See Study guide
11/16-11/17 (Sat.-Sun.)	Desert Field Trip	Handout: Field trip packet due at the end of the trip on Sun.
11/19	Rivers	Earth:Ch. 16p. 468-499
11/26 Tues.	Rivers / Groundwater	Earth:Ch. 17p. 502-527
11/27 to 12/1	THANKSGIVING BREAK	ENJOY!
12/3	Glaciers & Climate The Precambrian	Earth:Ch. 18p. 558-564 Earth: Ch. 22 p. 673-680 Video assignment due
12/10 <i>Lab Finals</i>	The Phanerozoic	Earth:Ch. 22 p. 681-701 Video assignment due
12/17 Tues.	Final Exam: 11:00-1:00	See Study Guide

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EOSC110: LAB SCHEDULE FOR FALL2019
Subject to change (including quizzes and exams)

Lab Num.	Thursday Friday	TOPIC (both sections cover same topic)	CUSTOM LAB MANUAL and READER
1	5 Sept. 6 Sept.	Review lab policies and safety Geologic Time Scale	READER exercise p. 3-7; MANUAL : p. 63
2	12 Sept. 13 Sept.	Geologic Time Scale Quiz Density Exercise / Minerals	* Pre-lab DUE p. 9 READER exercise p. 8-13; MANUAL : p. 78-97 and p. 10-12
3	19 Sept. 20 Sept.	Mineral Quiz Igneous / Sedimentary / Metamorphic Rocks	* Pre-lab DUE p. 15-16 READER exercise p.17-18; MANUAL : p. 102-119 Take-home : Conversion exercise (READER p. 19-20)
4	26 Sept. 27 Sept.	Plate Tectonics Isostasy	READER exercise p.25-27; MANUAL : p. 124-152 READER exercise p.22-24; MANUAL : p. 12-13 DUE : Conversion exercise
5	3 Oct. 4 Oct.	Relative Dating and Review	READER exercise p. 28-29; MANUAL : p.54-70; Earth:Ch. 9 p. 274-281
6	10 Oct. 11 Oct.	EXAM 1	See study guide
7	17 Oct. 18 Oct.	FALL HOLIDAY (both labs)	
8	24 Oct. 25 Oct.	Tourmaline Beach Field Trip	* Pre-lab DUE p. 30 See Bb for Tour. Beach info. Bring Tourmaline Beach exercise: READER exercise p. 31-35
9	31 Oct. 1 Nov.	Topographic Maps	* Pre-lab DUE p. 37 READER exercise p. 38-40; MANUAL : p.156-175 Take-home : Vertical exaggeration exercise in READER p. 41-42
10	7 Nov. 8 Nov.	Geologic Structures (folds and faults)	READER exercise p. 43-52. MANUAL p. 196-204 DUE : Vertical exaggeration exercise
11	14 Nov. 15 Nov.	No LAB	
	Sat. Nov. 16 Sun. Nov. 17	Mountain / Desert Field Trip	* Field Handout day of trip, DUE at the end of the trip on Sunday
12	21 Nov. 22 Nov.	Fossils / Fossil assemblages	READER exercise p. 53-62 Fossil manual available in lab
	28 Nov. 29 Nov.	Thanksgiving Break	Enjoy!
13	5 Dec. 6 Dec.	Geologic Maps Review for final	READER exercise p. 63-66. MANUAL p. 190-195
14	12 Dec. 13 Dec.	EXAM 2: LAB FINAL Last week of classes	

PLEASE BRING YOUR CUSTOM LAB MANUAL AND "LABORATORY READER" TO EACH LAB CLASS.