UNIVERSITY OF SAN DIEGO ENVIRONMENTAL AND OCEAN SCIENCES EOSC110: INTRODUCTION TO GEOSCIENCES / FALL 2023 T/TH 10:45-12:05 & Thursday/Friday 2:30-5:20

LECTURE /THURS. LAB INSTRUCTOR: Elizabeth (Liz) Baker Treloar (ok to call me Liz!)

- office: Shiley Science and Technology Center, #264.
- <u>email:</u> ebaker@sandiego.edu
 - office hours: Mon.: 11:30-2:00; Tues.: 2:00-4:30; and by appointment.
 - PLEASE try to remember to send email <u>BEFORE</u> you come to the office.

FRI. LAB INSTRUCTOR: 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: Free online text on Bb in content folder. PLEASE read, this will help supplement lecture material.

https://opengeology.org/textbook/

<u>Lab</u> (required): EOSC110 Laboratory "Reader" by Baker Treloar and Rector. This will ONLY be available <u>through the EOSC</u> <u>department</u> and will be passed out during the first lab meeting. No charge, cost was covered under pre-paid lab fee.

MAJOR AND CORE INFORMATION:

EOSC110 is designed as preparation course for the Environmental and Ocean Sciences major and minor. EOSC110 will also fulfill the **Core curriculum** explorations *Science and Technological Inquiry (ESTI)* requirement and *Quantitative Reasoning competency (CQUR,)* for **all majors.**

COURSE DESCRIPTION:

The objective of this course is to give students a comprehensive overview of the earth and its component systems. The emphasis of this course is the interactions among the atmosphere, geosphere, and hydrosphere. 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) modified from Dr. Beth O'Shea

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 <u>fundamental concepts of</u> <u>geoscience</u>. These knowledge or content learning outcomes include:

Geoscience Learning Outcomes (G_LO)

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

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

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 (CQUR) Learning Outcomes (QR_LO)

- 1. 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).
- 2. 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).
- 3. 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.
- 4. Evaluate Assumptions and Recognize Limitations: Make and evaluate important assumptions in estimating, modeling, and analysis of quantitative data as well as recognizing their limitations.
- 5. 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: <u>Scientific and Technological Inquiry (ESTI) Learning Outcomes</u> (ST_LO)

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

COURSE INFORMATION AND POLICIES: PLEASE BE FAMILIAR WITH THE FOLLOWING

- Regular attendance and being attentive in class are critical to your understanding of the subject matter and will improve your performance on the exams. As an introductory class, there is a <u>tremendous amount of information</u> 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 <u>understand the material</u>.
- Check your email and Blackboard: announcements and important information about the course will be posted on Blackboard.
- BLACKBOARD CONTENT: Lecture power point slides (pdf format), lecture notes, Panopto video recordings, study guides,
 animations, links to wake too, assignments, and additional reading will be susilable on Blackboard
- animations, links to websites, assignments, and additional reading will be available on Blackboard.
- COVID Information

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- Please let us know if you have a health concern and will be missing lecture or lab.
- o Please follow the University protocol, see following link: https://www.sandiego.edu/onward/
- What about other possible absences? Please communicate ASAP in person or by email with your professors.
- **<u>RESPECT</u>** your instructors and fellow students:
 - PLEASE TURN SOUND OFF ON <u>PHONES</u> AND PUT <u>AWAY</u> (off desks and laps)
 - NO electronic devices (laptops, pads, etc.) for taking notes.
 - o If you have permission from DLDRC or a valid reason for using a pad or laptop to take notes please let us know.
 - Please do not make a habit of excusing yourself in the middle of lecture or arriving late.
- FIELD TRIPS: field trips are an essential component of the course.

Mandatory Saturday field trip outside of class or lab time:

- Saturday Oct. 28th: ~ 7:00 AM to ~ 6:00 PM (details TBA closer to the trip date)
- Conflicts due to participation in sports events are not valid.
- If you are unable to attend due to a critical emergency or illness, a valid documentation of the emergency must be presented. PLEASE communicate ASAP and do not attempt to attend if you are having any illness symptoms.
- If a student **misses** the field trip **without a valid reason**, the field trip worksheet grade will be a zero.
- $_{\odot}$ $\,$ Details will be discussed closer to the time of the field trip $\,$
- **Kumeyaay Land Acknowledgement**: The land on which we gather is the traditional and unceded territory of the Kumeyaay Nation. We pay respect to the citizens of the Kumeyaay Nation, both past and present, and their continuing relationship to their ancestral lands.
- <u>LECTURE EXAMS</u>: will cover course material presented in lecture, field trips, and any additional information posted on Blackboard (you will be notified in class). The free online text: An Introduction to Geology, is an excellent resource to supplement lectures. Each exam/quiz is comprehensive and covers material prior to the exam date, however, will focus on the more recent material.

- **Make up exams or quizzes**, 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.
- Please stay home to keep others healthy. Students must alert the instructor before the exam start time with documented symptoms. A makeup time or makeup assignment (if a lab is missed), which may be different from the format of the original exam questions or assignment. Each case will be addressed individually.
- $_{\odot}$ $\,$ Exam scores will be available on Bb once exams are graded.

<u>ACADEMIC INTEGRITY</u>: 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 <u>Academic Integrity Policy</u>, which can be found in the University's Policy and Procedure Manual, this is available as a PDF file: <u>https://www.sandiego.edu/conuct/documents/Honor-Code.pdf</u>

HELPFUL RESOURCES: Please communicate any concerns or special needs in a timely manner.

- o Student Technology Resources: <u>https://www.sandiego.edu/its/get-help/student-resources/</u>
- One Stop Student Center: <u>https://www.sandiego.edu/one-stop/</u>
 - Financial Aid, Student Accounts and Registration questions.
- $\circ \quad {\tt Tutoring and Centers: https://www.sandiego.edu/cas/student-resources/tutoring-and-centers.php}$
- COVID Information: <u>https://www.sandiego.edu/onward/student-resources/</u>
- Counseling Center 24/7 access to a counselor: (619) 260-4655, press 1 for urgent concerns
- o Disability and Learning Difference Resource Center: <u>www.sandiego.edu/disability/</u>
- o Student Health Center MyWellness Portal https://mywellness.sandiego.edu/
 - Non-urgent email <u>usdhealthcenter@sandiego.edu</u>
- o Campus Assault Resources and Education: https://www.sandiego.edu/care/

LAB POLICIES:

- Lecture & lab coordination. Lecture discussions and lab activities support and reinforce each other. However, the order of topic coverage may vary such that sometimes you will be introduced to new concepts in lab and then explore them more deeply in lecture and vice versa. In other words, due to logistical constraints, lecture and lab will not always be integrated week by week. It will be important to come into lab prepared as the material may not yet have been covered in lecture
- Every student is expected to do their own work (complete lab activity worksheet) even though exercises are a group effort.
- Excused absences require previous notification and **verification** in case of illness or an unexpected emergency.
- **Exam questions** will be drawn from the lab discussion (PPT slides), lab exercises, and field trips. Questions may be multiple choice, short answer, fill in the blank, or hand sample, figure, or photo identification.
- Attendance is required 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. All lab and **take-home assignments** are due at scheduled time.

LAB AND FIELD SAFETY:

- When an emergency happens while you are in the LAB 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 your 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

- <u>65% of course grade from lecture performance:</u>
 - Exams and Quizzes (at least 90%).
 - Possible assignments (possibly post or pre-lecture Bb quiz) and <u>attendance</u>.
 - Punctuality, participation, and attitude are considered. *Making a habit of using your phone during lecture will negatively affect your grade.*

- THERE ARE NO EXTRA CREDIT assignments
- 35% of course grade from lab performance:
 - 30%: Lab and Field Exercises, attendance, punctuality, participation in lab and field, and attitude.
 - 70%: Exams and quizzes,
 - THERE ARE NO EXTRA CREDIT assignments
 - Points will be deducted:
 - Lab assignments turned in late without an extension.
 - Missing lab without giving notice and valid excuse.
 - Leaving lab or the field early without completing and turning in the exercise.
 - Forgetting to bring the reader to lab more than twice. 🙁
- You will receive one course grade for the lecture and lab combined. The **lecture** will count for **65%** of your final grade and the **lab** will count for **35%** of your final grade. You must receive a passing grade in both the lecture and the lab in order to pass the course.
- Exams, quizzes, assignments, and course grade will be determined using the following scale: Please do not ask if grades are curved 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 or lab on purpose.
- Pay attention and focus when you are in lecture and lab....cannot emphasize this enough!!
- Complete the lecture notes <u>during lecture</u>.
- Your homework each week:
 - After lecture (by the end of each week) read appropriate pages in FREE lecture text, pay attention to figures, and review lecture notes.
 - Take advantage of the PPT lectures on Bb and "fill in the gaps" you missed in lecture and complete your lecture notes
- Attend office hours if you have questions.
- Before the exam (days not hours!): Complete the study guide first on your own, this will encourage 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".
- You must <u>understand processes</u> (plate tectonics, erosion, etc.) and also be able to <u>think spatially and temporally</u> (e.g. Explain how calcium in an outcrop (rock exposure) of limestone can end up in a bivalve shell in the ocean 75 million yrs. later and 1000's of km away). This is the most challenging part about learning Geoscience. It is easy to memorize definitions 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.

ENJOY THE COURSE!



EOSC110: LECTURE OUTLINE AND READING FOR FALL 2023

SUBJECT TO CHANGE, INCLUDES QUIZ & EXAM DATES

Week of: Includes Tues. & Thurs.	Торіс	READ RELEVANT INFORMATION after lecture	
8/30 Thurs.	Introduction to the Course	Review course syllabus carefully	
9/5	 Geologic Time Earth's Origin Earths Internal Structure (Layers) 	 <u>https://opengeology.org/textbook/7-geologic-time/</u> <u>https://opengeology.org/textbook/8-earth-</u> <u>history/#82_Origin_of_the_Solar_System_The_Nebular_Hypothesis</u> <u>https://opengeology.org/textbook/2-plate_</u> <u>tectonics/#22_Layers_of_the_Earth</u> 	
9/12	 The Geosphere Earth's Internal Heat Introduction to Plate Tectonics 	 <u>https://opengeology.org/textbook/12-shorelines/#1225_Submarine_Canyons</u> <u>https://opengeology.org/textbook/7-geologic-time/#721_Radioactive_Decay</u> https://opengeology.org/textbook/2-plate-tectonics/ 	
9/19	 Plate Boundaries Paleomagnetism Hotspots If by some amazing chance we are ahead. Quiz 1 will be this week on Thurs. 	 <u>https://opengeology.org/textbook/2-plate-</u> <u>tectonics/#223 Plate Tectonic Boundaries</u> <u>https://opengeology.org/textbook/4-igneous-processes-and-</u> <u>volcanoes/#451 Distribution and Tectonics</u> <u>https://opengeology.org/textbook/2-plate-tectonics/#27_Hotspots</u> <u>https://opengeology.org/textbook/2-plate-</u> <u>tectonics/#213_Development_of_Plate_Tectonic_Theory</u> 	
9/26 Lab exam 1 (Thurs. & Fri.)	 QUI2 1 (Tues.) (Lecture before quiz) Review Silicate Minerals Igneous Rocks and Intrusive activity 	 <u>https://opengeology.org/textbook/3-minerals/</u> <u>https://opengeology.org/textbook/4-igneous-processes-and-volcanoes/</u> 	
10/3	Sedimentary RocksWeathering	 <u>https://opengeology.org/textbook/5-weathering-erosion-and-sedimentary-rocks/#53_Sedimentary_rocks</u> <u>https://opengeology.org/textbook/5-weathering-erosion-and-sedimentary-rocks/#55_Depositional_Environments</u> <u>https://opengeology.org/textbook/13-deserts/#133_Desert_landforms</u> <u>https://opengeology.org/textbook/5-weathering-erosion-and-sedimentary-rocks/#54_Sedimentary_structures</u> 	
10/10	Geologic Structures (folds & faults). Not on exam 1 EXAM 1 (Thurs.) (<i>G_LO2,3</i>)	 <u>https://opengeology.org/textbook/9-crustal-deformation-and-earthquakes/</u> <u>https://opengeology.org/textbook/13-deserts/#134_The_Great_Basin_and_the_Basin_and_Range</u> 	
10/17	EarthquakesEQ hazards	 <u>https://opengeology.org/textbook/9-crustal-deformation-and-earthquakes/</u> <u>https://opengeology.org/textbook/9-crustal-deformation-and-earthquakes/#98_Earthquake_Risk</u> <u>https://opengeology.org/textbook/9-crustal-deformation-and-earthquakes/#985_Secondary_Hazards_Caused_by_Earthquakes</u> 	
10/24	 San Andreas Fault and S. CA Faults QUIZ 2? (Thurs.) Mandatory Saturday Field Trip 	<u>https://opengeology.org/textbook/9-crustal-deformation-and-</u> earthquakes/#991_North_American_Earthquakes	
10/31	Rivers Environmental Issues	 https://opengeology.org/textbook/11-water/ https://opengeology.org/textbook/11-water/#115_Surface_Water 	
11/7	 Finish Rivers/Groundwater Tourmaline Beach field trip prep. for lab 	<u>https://opengeology.org/textbook/11-water/#116_Groundwater</u>	

11/14	 EXAM 2 (day TBA) (G_LO2,3) Volcanoes 	 <u>https://opengeology.org/textbook/4-igneous-processes-and-volcanoes/#45_Volcanism</u> <u>https://opengeology.org/textbook/15-global-climate-change/#1513_Greenhouse_Effect</u>
11/21	Volcanoes cont.	See above
11/22- 11/26	THANKSGIVING BREAK	ENJOY!
11/28	 Glaciers & Climate The Precambrian 	 <u>https://opengeology.org/textbook/14-glaciers/#145_lce_Age_Glaciations</u> <u>https://opengeology.org/textbook/8-earth-history/</u> <u>https://opengeology.org/textbook/8-earth-history/</u> <u>https://opengeology.org/textbook/15-global-climate-change/#153_Prehistoric_Climate_Change</u>
12/4 Lab Finals	• The Phanerozoic	 <u>https://opengeology.org/textbook/8-earth-history/</u> <u>https://opengeology.org/textbook/15-global-climate-change/#153_Prehistoric_Climate_Change</u>
12/19	Exam 3 (Final): (G_LO4,5)	See Study Guide
Tues	11:00-1:00	No early exams please

EOSC110: LAB SCHEDULE FOR SPRING 2023

SUBJECT TO CHANGE (INCLUDING QUIZZES AND EXAMS)

Lab	Thursday Friday	TOPIC (both sections cover same topic) (G_LO6) all topics	LAB READER NOTE: some labs are out of sequence in Reader
1	8/31 9/1	Review lab policies and safety Geologic Time / Conversions Take-home: Conversion exercise	READER exercise p. 3-10 READER p. 27-32 (QR_LO2)
2	9/7 9/8	Rock Density / Minerals Geologic Time Quiz (first ~ 15 min.) Pre-lab DUE p. 14	READER exercise p. 11-13 / p. 14-16 (ST_LO1); (G_LO1)
3	9/14 9/15	Mineral <mark>Quiz</mark> (first ~ 30 min.) Rocks Pre-lab DUE p. 17-18	READER exercise p. 17-26 (G_LO1)
4	9/21 9/22	Plate Tectonics and Isostasy Unit Conversions DUE	READER exercise p. 33-45 (QR_L01,2,3,4,5); (G_L03)
5	9/28 9/29	Lab Exam 1 (G_LO1, 3); (QR_LO1,2,3)	SEE Study Guide: Minerals, Rocks, and Plate Tectonics
6	10/5 10/6	Topographic Maps Pre-lab DUE p. 46	READER exercise p. 46-52 (ST_LO2); (QR_LO2,3)
7	10/12 10/13	Relative Dating	READER exercise p. 53-55 (ST_LO2)
8	10/19 10/20	Topo. map Quiz (first ~ 30 min.) Geologic Structures and Maps (folds and faults)	READER exercise p. 56-66 (ST_LO2)
9	10/26 10/27	Pre-Field Trip Lecture and Exercise	READER exercise p. 67-68
	10/28	MANDATORY SATURDAY FIELD TRIP	Field Trip exercise (not in Reader, handed out morning of trip) (G_LO1,3,6); (ST_LO1,2,3,4)
10	11/2 11/3	NO LAB MEETING	Lab off for attending Sat. field trip ©
11	11/9 11/10	Tourmaline Beach Field Trip (might switch and do fossils this week) Pre-lab DUE p. 78	BRING: <u>READER exercise</u> p. 78-84 See Bb for Tourmaline Beach info.,for the prelab
12	11/16	Fossils	READER exercise p. 69-77 (G_LO4) Eoscil manual quailable in lab
	11/17 11/23 11/24	THANKSGIVING	ENJOY!
13	11/30 12/1	Review Lab	Exercise is not in the lab reader
14	12/7 12/8	Lab Exam 2 (final) (G_LO4); (ST_LO3,4)	SEE Study Guide: all labs since exam 1 and Sat. field Trip

PLEASE BRING YOUR "LABORATORY READER" TO EACH LAB CLASS.