

Welcome to Geology 10

Geology 10: *Introductory Geology*

Winter Quarter, 2021

GEOL 10 (5.0 units)

GEOL 10.20Z *With Lab Via Zoom*

GEOL 10.53Z, 54Z *With Independent Online Lab*



Earth and Space
Sciences Program

Course website: on Canvas via your De Anza MyPortal
F 20 GEOL D10 Introductory Geology

Hi and welcome to Introductory Geology. I am looking forward to joining you on a journey of discovery of your home planet. Please think of my role more as a guide on an alien world rather than as a "teacher." Also feel free to contact me if there is anything I can do to help you achieve success in the class.

Dr. D

Contact Information

Christopher DiLeonardo, Ph.D.

Office S14a

(Behind Geology Teaching Lab)

Office Hours Tu, Th 9:30 to 11:30 am *(Via Zoom)*

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Course Catalog Information

Analysis of the composition, structure, and description of the Earth's external and internal features and the geologic processes responsible for their origin and evolution. Examination of the concepts and principles upon which geologic knowledge is based. One Saturday field trip is required.

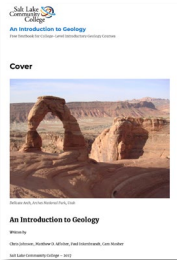
Course Objectives for GEOL 10: Introductory Geology

The course objectives for Introductory Geology expand out of the overarching Student Learning Outcomes. In general they are intended to foster an understanding of the scientific approach to problem solving and a specific knowledge of the fundamental concepts of geology.

- A. Summarize and describe a globally and temporally inclusive overview of the Earth.
- B. Distinguish between hypotheses, theories, and laws, and demonstrate the assessment of hypotheses through testing.
- C. Analyze the physical properties of minerals and their significance in rock genesis, starting with basic chemical principles.
- D. Distinguish between the major families of rocks and analyze how they relate to each other as parts of the rock cycle; interpret conditions of formation from physical characteristics of rocks.
- E. Evaluate relative age-relationships between rock units in order to develop a geologic time scale, and calibrate this time scale by calculating rock ages via isotopic dating.
- F. Construct and interpret geologic maps and cross-sections in order to delineate the three-dimensional structure of the earth's crust; visualize structures such as faults and folds.
- G. Assemble and synthesize geophysical information in order to assess earthquake hazards and to construct plausible models of the Earth's deep interior.
- H. Synthesize geological, seismological, and paleomagnetic data in order to demonstrate an understanding of global plate tectonics, and predict phenomena such as the locations of earthquakes and volcanoes.

- I. Analyze imagery and topographic data in order to elucidate the evolution of landforms produced by the interaction of rock, soil, water, wind, and ice.
- J. Evaluate and assess environmental hazards in a geologic context; assess locations of geologic resources such as mineral deposits and hydrocarbons from geologic data, and appraise the impacts of geologic resource issues on the environment and human populations.

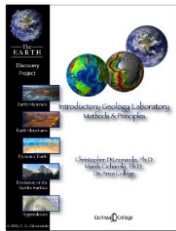
Required Materials



Note: It is your responsibility to be prepared for each class session. Having the required materials, doing readings, having the proper laboratory exercise with you at the right time is important to your success.

Textbook: *An Introduction to Geology*, Johnson, C., Matthew, A.D., Inkenbrandt, P., Mosher, C. 2017 Salt Lake Community College.

Note: Digital Online Textbook, is a Creative Commons Work, free for noncommercial use. Readings will be available through the Canvas course site.



Lab/Activities: Come from the free digital lab manual: *Introductory Geology Laboratory: Methods and Principles*, v. 1.4, DiLeonardo, C.G. The Earth Discovery Project 2020.

Note: Lab exercises will be available weekly through Canvas site online.

Other: Color pencils and Millimeter scale/ruler

Weekly Class Modules

A module is specific and discrete learning segment that leads to the understanding of a given topic or set of topics. Modules will be assigned by topic on Canvas. Modules include all assignments that will be completed for a particular topical set. A module is a specific and discrete learning segment that leads to the understanding of a given topic. Modules are to be completed within the dates specified on the syllabus (schedule is below). More details on these assignments, including which ones will be turned in, as well as how they will be turned in are explained below and on the assignments themselves.

A Note on Online Learning

Online courses are different from traditional lecture courses. They offer much more flexibility in completing assignments and learning material from sources other than traditional lectures. However, you will need to have good self-discipline in completing these tasks, especially in a timely manner. This is a five-unit lecture-laboratory course. This equates to four hours of lecture and 3 hours of laboratory work per week during a regular quarter. This does not include the extra personal study time needed in addition to those mandatory class hours that the State of California and De Anza College requires. If you are planning on mastering the material covered this quarter, you will need to make sure you 1.) Are engaged in the course at least 7-hours a week (not including study time); 2.) Login at least two different days during the week (to stay current in the course); 3.) Prepare the exams using your notes from online learning tutorials, your completed laboratory activities, and your textbook readings.

Learning Tutorial

Learning tutorials online will be used instead of traditional lectures. They may incorporate video lectures or other materials online. Any lectures will be delivered via a link to a YouTube presentation other materials will be offered via a link to an online learning resource. Missing the learning tutorials, much as missing lectures in a traditional class, will severely impact your learning of the subject and impact your work on exams. As much of the exam material comes out of learning tutorials you are encouraged to discipline yourself to go through them in each module and take notes. Notes do not need to be turned into me, but will become invaluable resources along with your textbook in completing the exams.

Laboratory Activities

In each module will be an inquiry-based laboratory activity that leverages the learning on that topic. You will commonly write answers down on laboratory worksheets that you will keep in your *Earth Discovery Journal*. Once completed you will answer questions online that I will review regarding the activity you completed. The work in your *Earth Discovery Journals* is for your own use and will not be collected, but it will not be possible to complete the activity reviews without doing the activity first and referencing your journal. Also, your journal will be invaluable in preparing your exams for the course.

Online Independent Lab Sections (Sec. 53z and Sec. 54z)

Your sections will work completely independently on lab assignments, though you may collaborate with one another if you wish. Each lab will have introductory materials, combination of videos, readings or both. After completing the virtual laboratory module, you will scan it or take pics of each page and upload them to submit via Canvas. Check the lab module page for each week for instructions.

Online with Zoom Meetings Lab Section (Sec. 20z)

Your section will meet on Tuesdays for laboratories. You are still expected to go in online and complete the introductory material for the lab and download the lab worksheet before our Tuesday meetings. I will go over the lab work with you answer questions and discuss the previous lab each week. I will set up breakout rooms for groups to discuss and collaborate on lab work. After completing the virtual laboratory module, you will scan it or take pics of each page and upload them to submit via Canvas. Check the lab module page for each week for instructions.

Readings from Web Textbook

This class is designed around an integrated approach to learning. It is very important that you do the reading in the online textbook assigned each week. The book will also be an invaluable resource for preparing the midterm and final exam for the course. The readings are important part, especially in an online course where your work is more independent than a face-to-face classroom situation. Each week you will find a link to online readings in your weekly Class Page on the *Canvas* class site. You should engage in these readings prior to watching the *Learning Tutorial* video series.

Academic Policies & Progress

Students are advised to consult their College Catalog or Student Handbook regarding issues of discipline, cheating, etc. The counseling staff and I are also available to discuss college policy as the need arises. You are encouraged to monitor and discuss with me your academic progress in this course. The grading system is clearly outlined below and there will be no “special” projects available to make up for *poor* academic performance. But... the course is designed for your success.

Academic Policies & Progress

You are encouraged to monitor and discuss with me your academic progress in this course. The grading system is clearly outlined below and there will be no “special” projects available to make up for *poor* academic performance.

Note: Failure to properly withdraw from the course will result in a letter grade of “F” for the course.

Virtual Field Trip

Students enrolled in *Introductory Geology* will participate in a virtual field trip as part of the course. This activity is a required part of the curriculum for the class. Information will be made available later in the quarter .

A Note About Virtual Laboratories & Field Trips

Every effort in this course is made to construct virtual learning experiences that provide the same student learning outcomes as the course offered in a “face-to-face” format. Virtual field trips and laboratories are created with this in mind. Laboratory exercises will be offered weekly that dovetail with the learning presented in *learning tutorials*, and *web-textbook* readings. Laboratory activities will follow the same sequence generally offered in face-to-face laboratories. Laboratory exercises can be found on the Canvas class site for each week. Follow the instructions on the site. In most cases you need to download and printout a laboratory activity to follow instructions and record your answers. These will not be collected but are invaluable in preparing for quizzes and the midterm and final exams. I encourage you to create an *Earth Discovery Journal*, a notebook that keeps all of

Grading

1,000 pts for the class:

Area A: Methods & Principles

150 pts. In-class laboratory and field projects (collaborative experiences)
50 pts lab participation first ½ of course *50 pts lab participation 2nd ½ of course*
50 pts field workshop participation

Area B: Concepts

150 pts. Concept quizzes
25 pts Earth Science IQ *25 pts Igneous Rocks*
25 pts Seismology *25 pts Depositional Environments*
25 pts Plate Tectonics *25 pts Geologic Time*

Area C: Skill Proficiency Areas

100 pts. Proficiency Quizzes and “Team Challenges” (in-lab)
25 pts Topographic Map Quiz (individual assessment) *25 pts Geo Detectives Challenge (Rock Classification: collaborative)*
25 pts Mine Challenge (Mineral ID: collaborative) *25 pts Geologic Map & Earth Structures Quiz (individual assessment)*

Area D: Application & Synthesis

300 pts. Midterm Exam
150 pts Midterm Exam Part A collaborative take-home
150 pts Midterm Exam Part B online exam

300 pts. Final Exam*
150 pts Final Exam Part A collaborative take-home
150 pts Final Exam Part B online exam

Final Grade

Plus	Letter Grade	Minus	Rubric
A+ > 999 pts	A = 895 to 999	A- = 875 to 894	<i>Student displays both a level of knowledge and understanding of Geology & the Earth system superior to the general public.</i>
B+ = 855 to 874	B = 771 to 854	B- = 750 to 770	<i>Student displays a level of knowledge of Geology & the Earth system significantly above that of the general public; and a basic understanding of the principles of Geology & the Earth system.</i>
C+ = 730 to 749	C = 625 to 730		<i>Student demonstrates a basic knowledge and understanding of Geology</i>

			<i>&the Earth system above that of the general public.</i>
D+ = 605 to 624	D = 520 to 604	D- = 500 to 519	<i>Student does not demonstrate knowledge and understanding of Geology & the Earth system beyond that of the general public.</i>
F < 500			

Final grades are “non-negotiable” and are based entirely on your performance in class work, quizzes, collaborative experiences, and exams. Once posted, grades cannot be changed unless there is a recording error. This is a matter of State Law. Please don’t ask!

Each student is required to complete virtual the field trip and be participate in the final examination to receive a passing grade for the course.*

Class Schedule Winter 2021

Class Schedule is tentative and subject to change by your professor as deemed necessary. You are encouraged to check the class website each week for changes and updates to the class schedule. Note: Readings and Laboratory Activities can be accessed through the Canvas Class Website. This term is ten weeks long with a week prior considered as a “Pre-Term Prep Week. The schedule may be changed as needed by the instructor during the term. All changes to the schedule will be updated on the Class Site in Canvas.

WEEK

Date / Session

Topic:

Learning Tutorial/Activity/ Assignment

Reading

An Introduction to Geology

PART I: THE DYNAMIC PLANET

01

Pre-Term Prep Week

01/04 - 01/10

Learning Tutorial 1-0: Down to Earth (ER1)*

Chap. 1.0

Learning Tutorial 1-2: The Restless Planet (ER2)

Lab Activity 01

Lab: Topographic Maps

(printout lab worksheet from online lab manual)**

Due This Week

Pre-Class Earth Science IQ Quiz Sunday 1/10

02

The Study of a Dynamic Planet

01/11- 01/17

Learning Tutorial 2-1: Earthquakes (ER9)

Chap. 9.5 – 9.9

Learning Tutorial 2-2: Plate Dynamics (ER6)

Chap.2.0

Lab Activity 02

Lab: Virtual Earthquake

(online lab no worksheet for this laboratory)

Important Note: Last day to drop without a W is Sunday 1/17

03 The Heat Within and the Dynamic Earth

01/18 – 01/24 Learning Tutorial 3-1; *The Birth of a Theory* (ER5)

Learning Tutorial 3-3: *Volcanism* (ER13)

Chap. 4.5

Lab Activity 03 Lab: *Plate Tectonics & Plate Motions*
(printout lab worksheet from online lab manual)

Due This Week Concept Quiz: Seismology Thursday 1/21

*Learning Tutorials will be from the Annenberg Project Video Series *Earth Revealed*, originally produced in 1992. This comprehensive exploration of the topics of our course will parallel readings, class discussions and our laboratory sequence.

WEEK

Date / Session

Topic:

Learning Tutorial/Activity/ Assignment

Reading*An Introduction to Geology**04**The Changing Face of the Earth*

01/25 – 01/31

Learning Tutorial 4-1: Running Water I: Rivers, Erosion and Deposition (ER19)

Chap. 11

Learning Tutorial 4-2: Running Water II: Landscape Evolution (ER20)Learning Tutorial 4-3: Waves, Beaches and Coastlines (ER24)

Chap. 12

Lab Activity 04*Evolution of an Integrated Stream System*
(printout lab worksheet from online lab manual)**Due This Week**Proficiency Quiz: Topographic Maps Tuesday 1/26
Concept Quiz: Plate Tectonics Sunday 1/31*05**The Mountains Rumble*

02/01 – 02/07

Learning Tutorial 5-1: Deserts (ER22)

Chap. 13

Learning Tutorial 5-2: Glaciers (ER23)

Chap. 14

Lab Activity 05*Modification of Stream Eroded Landscapes by Glaciation*
(printout lab worksheet from online lab manual)**Midterm Exam**Download Midterm Packet and Part A of Exam
Available on Monday 2/1
due next Tuesday 2/9
Midterm Part B opens Thursday 2/4 due next Tuesday 2/9**PART II: WRITTEN IN STONE***06**The Universe Beneath Each Footstep*

02/08 -02/02/14

Learning Tutorial 6: Minerals: The Materials of the Earth (ER22)

Chap. 3

Lab Session 06

Lab: *Mineral Properties and Identification*

(printout lab worksheet from online lab manual)

Due This Week

Midterm Exam Answers Part B submit through online submission sheet Tuesday 2/9

Part B take online by Tuesday 2/9

<u>WEEK</u> Date / Session	<u>Topic:</u> Learning Tutorial/Activity/ Assignment	<u>Reading</u> <i>An Introduction to Geology</i>
<i>07</i>	<i>The Record of the Rocks</i>	
02/15 - 02/21	<u>Learning Tutorial 7-1: Intrusive Igneous Rocks</u> (ER14)	Chap. 4.1-4.4
	<u>Learning Tutorial 7-2: Metamorphic Rocks</u> (ER18)	Chap. 6
Lab Activity 07	<u>Lab: Rock Textures and Genesis</u> (printout lab worksheet from online lab manual)	
<i>08</i>	<i>Pages of Stone</i>	
02/22 - 02/28	<u>Learning Tutorial 8-1: Weathering & Soils</u> (ER15)	Chap. 5
	<u>Learning Tutorial 8-2: Sedimentary Rocks Keys to Past Environments</u> (ER17)	
Lab Activity 08	<u>Lab: Rock Genesis & Classification</u> (printout lab worksheet from online lab manual)	
Due This Week	Proficiency Quiz: Mineral ID Tuesday 2/23 Concept Quiz: Igneous Rocks Thursday 2/25	
Important Note:	Last day to Withdraw from class is Friday 2/26	
<i>09</i>	<i>Riddle of the Rocks</i>	
03/01 - 03/07	<u>Learning Tutorial 9-1: Earth Structures</u> (ER8)	Chap. 9.1 – 9.5
Lab Activity 09	<u>Lab: Earth Structures Part I</u> (printout lab worksheet from online lab manual)	
Due This Week	Concept Quiz: Sedimentary Environments Thursday 3/4 Proficiency Quiz: Rock Classification Thursday 3/4	
<i>10</i>	<i>Written in Stone</i>	

03/08 - 03/14 Learning Tutorial 9-2: *Geologic Time* (ER17) Chap. 7

Lab Activity 10 Lab: *Earth Structures*
(printout lab worksheet from online lab manual)

Virtual Field Workshop Virtual Field Trip opens Monday 3/08

WEEK

Date / Session

Topic:

Learning Tutorial/Activity/ Assignment

Reading

An Introduction to Geology

11 *The Game of Stones*

03/15 - 03/21 Learning Tutorial 10-1: *Mountain Building* (ER7)

Lab Activity 11 Lab: *Geologic Maps & Cross-sections*
(printout lab worksheet from online lab manual)

Virtual Field Workshop Virtual Field Trip TBA due Sunday 3/21 11:55 PM

Due This Week Concept Quiz: *Geologic Time* Tuesday 3/16
Proficiency Quiz: *Earth Structures* Thursday 3/3

Final Exam Download Final Exam Packet and Part A of Exam
Available on Monday 3/15
due next Tuesday 3/23
Final Exam Part B opens Thursday 3/18 due next Tuesday 3/23

12 *Final Exam*

FINAL EXAM SCHEDULE: GEOL 10

3/23 **GEOL 10 Secs. 20Z, 53Z and 54Z**
Tuesday (3/23) Final Exam; Closes at 11:55 pm.

Enjoy your Spring Break!
But not too much.

Student Learning Outcome(s):

- *Apply the principles of scientific methodology to evaluate hypotheses on how the earth works as an integrated system.
- *Use data and observations to track and predict changes in the Earth system resulting from dynamic Earth Processes.
- *Use observations from the crust and lithosphere of the Earth to determine geologic history at hand-sample, outcrop, local, and regional scales.
- *Apply scientific methodology and geologic principles to analyze the impact of the Earth system on humanity, from specific natural hazards and the availability, use, and distribution of Earth resources.