

Welcome to Geology 10

Geology 10: *Introductory Geology*
Fall Quarter, 2019
GEOL 10 (5.0 units)
GEOL 10.62



GEOL 10.62 Tu, Th 6:00 pm to 9:15 pm (Lec & Lab)
Course website: on Canvas via your De Anza MyPortal

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.

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(Behind Geology Teaching Lab)

Office Hours M, W 10:30 to 11:30 am

by appointment Tu, Th 5:00 to 6:00 pm

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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

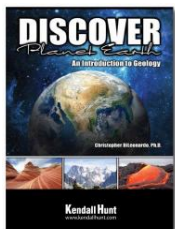
Every effort is made so that each student will feel comfortable in a supportive collaborative learning environment. I invite you all to work with me towards achieving that goal. I also invite you to reach out to each other in the class and work with all of your colleagues giving each classmate and their thoughts the respect deserved.

The course objectives for Introductory Geology expand out of the overarching S-L-O. 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: *Discover Planet Earth: An Introduction to Geology*, DiLeonardo, Christopher G., James, B. R., Kendall-Hunt Publishing, 2013. ISBN: 978-1-4652-2825-3 **Note:** Digital Online Textbook, purchase license from the online site. Please see the guide for registration attached to the welcome email.



Lab/Activities: Come from the free digital lab manual: *Methods and Principles in Introductory Geology*, v. 1.3, DiLeonardo and Cichanski. The Earth Discovery Project.

Note: Lab exercises will be emailed to you attached to the weekly class email.
Other: Color pencils and Millimeter scale/ruler

Class Policies

Attendance

Students are expected to attend every class meeting! Missing class may have the single greatest negative effect on your learning. Missing a class has a huge “ripple effect” as holes form in your learning that impede your understanding of future lectures, laboratories, or readings. Commonly when I meet with students during the term who are struggling, attendance is a major issue. A student may be dropped from this course if the absences exceed the equivalent of one week’s work in either lecture or laboratory. Students who wish to drop must follow proper withdrawal procedures as outlined in the schedule of classes. DO NOT ASSUME that your professor has removed you from the course.

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

A Note on Laboratory Work

Laboratory work is a collaborative discovery-based-learning experience. These activities happen in real time and in sequence with the lecture. Whereas students are encouraged to go over individually and with their lab partners any missed work, the actual experience cannot be made up. It is important to note as well that missing lab work has a cumulative negative impact on your learning. Deductions to your participation score will reflect that impact. The first lab session missed during each half of the term will result in a 10-point deduction for each session. More missed lab work will be deducted at 15 points per session up to the 50 points available for each half of the course. Also note students exceeding the attendance policy in

miss out on the point of much of what follows in the lecture. Students who arrive after the official start time of the class will be marked as “late.” Students arriving late are disruptive to the educational environment of the class. This will not be tolerated. Two “late marks” will be considered the equivalent to an absence and will be counted as such with regards to the attendance policy (see above) and in calculating participation (laboratory and field work) scores for the final grade.

Preparation for Class

You should come to class prepared. Students who are not prepared struggle through the individual class and through the course. If you attend every class meeting, and complete every reading and assignment prior to the class it is due you should have little trouble in passing this course. Higher levels of mastery of the subject may require more effort. This is a moderately rigorous college science class and laboratory. Having said that you have the ability and I am here to work with you. Your level of success is dependent on you, if you have issues that are causing you difficulties talk to me and we'll see if we can work through it together or if there are resources on campus available to you that could offer help.

Academic Integrity

You have made a commitment to your education by enrolling at De Anza College. This commitment requires that you represent your own academic work honestly to others. Academic dishonesty “cheating,” will not be tolerated. Please read the college policies regarding academic dishonesty in the college catalog. Students who have been found to be engaging in academically dishonest behavior (“cheating”) while participating in this course will receive a letter grade of F for the assignment and may be referred to the Dean of Students for college disciplinary action. Students found to be cheating on any assignment will call into question the validity of their course assessment and must retake ALL assessment instruments to insure their voracity.

Arriving on Time for Class

Students are expected to arrive for class on time! Being late to class is not only disruptive to the learning environment of your classmates, but also has a huge negative impact on your own learning. The first ten to fifteen minutes of class is when critical information is given about assignment and schedule changes. If missed you may not realize that an assignment, quiz or exam was moved up or back in the schedule. More importantly, the beginning of each lecture is commonly where the educational framework for the lecture is set. If you walk in late you may not have the “scaffolding” to hold your learning on and

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.

Cellular Phones, mobile devices, other personal electronic devices

The use of cellular phones, iPods, music players, or other personal electronic devices during lecture or laboratory activities is prohibited. Computers used to take notes during lecture are allowed as long as they are not being used for another purpose or for online access of any kind. Laboratory computers are for completing laboratory activities only and not to be used for other purposes. Students not in compliance with this policy will be asked to leave the class for the day on a first violation and may be dropped from the class if a second violation occurs. Students found to be using any electronic device during a test, quiz, or exam, will receive a 0 and be asked to leave the class for the day. This will be considered an absence for purposes of the attendance policy.

Field Workshop & Waiver of Liability

Students in Geology 10 must attend the Introductory Field Workshop*. Please see the schedule below for the date and time of the field workshop.** State law mandates ALL students participating in an off campus “field excursion” sign an appropriate waiver. As the fieldwork is a requirement of the curriculum students who refuse to sign the waiver are opting out of the course and will be dis-enrolled.

*****Americans With Disabilities Act (ADA) Exemption from Field Work:***

Students with physical limitations or other special needs that would preclude participation in fieldwork will be given an appropriate alternate assignment. Every reasonable accommodation will be provided so that all students can participate and benefit from the field experience. If you have questions or concerns regarding access and participation issues please contact your instructor. This exemption only applies to students with documented disabilities that have been verified through the Disabled Students Program & Services Office at De Anza College and where no appropriate accommodation can be made for participation.

Class Schedule Fall 2019

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.

| <u>WEEK</u> Date / Session | <u>Topic:</u> Activity/ Assignment | <u>Reading</u> Discover Planet Earth |
|--|---|--|
| PART I: THE DYNAMIC PLANET | | |
| <i>01</i> | <i>Science and the Study of Planet Earth</i> | |
| 09/24 | <u>Lec:</u> Orientation | |
| 09/26 | <u>Lec:</u> The Science and Discovery of the Restless Earth | <i>Concepts in Geology</i> Chap. 1.0 |
| Lab Session 01 | <u>Lab:</u> No Lab meetings during first week. | |
| <i>02</i> | <i>A Planet in Motion</i> | |
| 10/01 | <u>Lec:</u> Rock & Roll in California: Seismic Surfing <i>*In CHAP. 9.0 make sure to click on the button to look at "Earthquakes at Plate Boundaries" at end of the chapter.</i> | <i>Tectonic Framework</i> Chap. 9.0* |
| 10/03 | <u>Lec:</u> The Plate Tectonic Framework | <i>Tectonic Framework</i> Chap. 7.0 |
| Lab Session 02-A* | <u>Lab:</u> <i>Virtual Earthquake</i> (no lab worksheet) | |
| Lab Session 02-B** | <u>Lab:</u> <i>Plate Tectonic Boundaries and Absolute and Relative Plate Motion</i> (printout lab worksheet and bring to lab) | |
| *For evening college, A is 1st lab session of the week. **B is 2nd lab session of the week. For day classes A and B represent 1st and 2nd ½ of the lab session. Without designation covers whole lab for the week. | | |
| <i>03</i> | <i>The Heat Within and the Evolving Surface</i> | |
| 10/08 | <u>Lec:</u> Plate Tectonic the Anatomy of a Scientific Revolution Concept Quiz: Seismology due Tuesday | <i>Tectonic Framework</i> Chap. 8.0 |
| 10/10 | <u>Lec:</u> Volcanism and Volcanic Hazards | <i>Igneous & Metamorphic Processes</i> |
| Lab Session 03-A | <u>Lab:</u> <i>Plate Tectonic Boundaries and Absolute and Relative Plate Motion</i> | Chap. 4.0 |
| Lab Session 03-B | <u>Lab:</u> <i>Topographic Maps and Visualizing the</i> | |

Earth's Surface (printout lab worksheet from online lab manual)

| <u>WEEK</u> Date / Session | <u>Topic:</u> Activity/ Assignment | <u>Reading</u> Discover Planet Earth |
|--------------------------------------|---|--|
| <i>04</i> | <i>The Changing Face of the Earth</i> | |
| 10/15 | <u>Lec:</u> Streams, Floods and Water on the Surface Concept Quiz: Plate Boundaries due Tuesday | <i>Surficial Processes</i> Chap. 15.0 |
| 10/17 | <u>Lec:</u> Changing Climates and Landscapes | <i>Surficial Processes</i> Chap. 16.0 |
| Lab Session 04-A | <u>Lab Activity:</u> <i>Evolution of an Integrated Stream System</i> (printout lab worksheet from online lab manual) | |
| Lab Session 04-A | <u>Lab Activity:</u> <i>Modification of a Stream Eroded Landscape by Glaciation</i> (printout lab worksheet from online lab manual) <i>Proficiency Quiz Topographic Maps</i> | |
| <i>05</i> | <i>The Mountains Rumble</i> | |
| 10/22 | <u>Lec:</u> Mountain Building Midterm Exam Packet Game of Stones Part I sent out | <i>Tectonic Framework</i> Chap. 11.1 |
| 10/24 | <u>Lec:</u> Open Session for Midterm Exam Prep (Bring Midterm Exam Packet with you to class meeting) | |
| Lab Session 05 | <u>Lab Activity:</u> <i>Tectonic Activity and Landform Evolution</i> (printout lab worksheet from online lab manual) | |

PART II: WRITTEN IN STONE

| | | |
|------------------------|---|---|
| <i>06</i> | <i>The Universe Beneath Each Footstep</i> | |
| 10/29 | <u>Midterm Exam</u> | |
| 10/31 | <u>Lec:</u> Crystallization and Minerals of the Crust | <i>Concepts in Geology</i> Chap. 3.0 |
| Lab Session 06A | <u>Lab:</u> No lab meeting Tu (Night Class Only). shortened lab for all Day Sections. | |
| Lab Session 06B | <u>Lab:</u> <i>Mineral Properties and Identification</i> (printout lab worksheet and bring to lab) | |
| <i>07</i> | <i>The Record of the Rocks</i> | |

| | | |
|------------------------|---|--|
| 11/05 | <u>Lec:</u> Rocks that form underground | <i>Igneous & Metamorphic Processes</i> |
| 11/07 | <u>Lec:</u> Igneous Rocks and Plutons | Chap. 5.0 & 6.0 |
| Lab Session 07A | <u>Lab:</u> <i>Mineral Properties and Identification</i> (printout lab worksheet and bring to lab) | |
| Lab Session 07B | <u>Lab:</u> <i>Rock Textures and Genesis</i> (printout lab worksheet and bring to lab) | |

| <u>WEEK</u> Date / Session | <u>Topic:</u> Activity/ Assignment | <u>Reading</u> Discover Planet Earth |
|--------------------------------------|---|--|
| <i>08</i> | <i>Pages of Stone</i> | |
| 11/12 | <u>Lec.:</u> Sediments & Sedimentary Structures (download worksheet and bring it to class) <i>Concept Quiz: Igneous Rocks due Tuesday</i> | <i>Surficial Processes</i> Chaps. 12.0 & 13.0 |
| 11/14 | <u>Lec.:</u> Sedimentary Environments | |
| Lab Session 08A | <u>Lab:</u> <i>Rock Textures and Genesis</i> (printout lab worksheet and bring to lab) | |
| Lab Session 08B | <u>Lab:</u> <i>Rock Genesis & Classification</i> (printout lab worksheet and bring to lab) <i>Team Challenge: Mine Challenge</i> | |
| <i>09</i> | <i>Riddle of the Rocks</i> | |
| 11/19 | <u>Lec.:</u> <u>Workshop.:</u> <i>Rock Genesis & Classification</i> and <i>Intro. to Rock Deformation</i> (printout lab worksheet and bring to lab) | <i>Tectonic Framework</i> Chap. 10.0 |
| 11/21 | <u>Lec.:</u> Geologic Time & Interpreting Earth History <i>Concept Quiz: Depositional Environments due Thursday</i> | <i>Concepts in Geology</i> Chap. 2.0 |
| Lab Session 09A | <u>Lab Activity:</u> <i>Outcrop Patterns and the Orientation of Strata in the Earth's Crust</i> (printout lab worksheet and bring it to lab) | |
| Lab Session 09B | <u>Lab Activity:</u> <i>Outcrop Patterns and Age Relationships of Folded Strata.</i> (printout lab worksheet and bring it to lab) <i>Team Challenge: Geo-detectives Rock Hunt</i> | |
| <i>10</i> | <i>Written in Stone</i> | |

11/26 Lec.: Geologic Time & Interpreting Earth History, ctnd.

11/28 Thanksgiving Holiday: No class meeting

Lab Session 10A Lab Activity: *Structure and Geologic Interpretation of
Folded Strata.*
(printout lab worksheet and bring it to lab)

Lab Session 10B Thanksgiving Holiday: No class meeting

WEEK
Date / Session

Topic:
Activity/ Assignment

Reading
Discover Planet Earth

11

The Game of Stones

This week is the fieldtrip exchange no lab either night and no class on Tuesday night. You are encouraged to work with your classmates in preparing for the final exam Part B next week.

12/03

Lec.: No Class Field Trip Exchange

12/05

Lec.: Open Lab for Final Exam
Concept Quiz: Interpreting Geologic History due

Lab Session 11

Lab Activity: No Lab Field Trip Exchange

SATURDAY

12/07

Introductory Field Workshop (Required)*
Field Exercise: *Geologic History of Cliff Exposures at Montara State Beach, California 9:15 am to 12:45 pm*

12

Final Exam

FINAL EXAM SCHEDULE: GEOL 10

12/10

GEOL 10 Sec. 62 Night Class
Tuesday Evening: 6:15 p.m.-8:00 p.m.

Enjoy your Winter Break!

**Notes for Final Exam:*

- 1. Attendance at the Final Exam is mandatory. Students must complete the field requirement and attend the final exam to receive a passing grade.*
- 2. Bring your Exam Packet (Game of Stones Part II) with any notes or interpretations on it to the Final Exam Part B.*
- 3. You must have completed Part A of the Final Exam and turned in your answers PRIOR to starting Part B.*
- 4. You may NOT have a copy of the Part A questions in front of you while taking the Part B portion of the Final Exam.*

5. *Mark all answers on the ParScore® form with #2 pencil and have a good eraser to completely erase any changes.*

Make sure to put your name and PIN number for the term on your ParScore® form and bubble in those sections prior to starting your Part B portion of the Final Exam.

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.