

To a person uninstructed in natural history, his country or seaside stroll is a walk through a gallery filled with wonderful works of art, nine-tenths of which have their faces turned to the wall.

Thomas Henry Huxley

Geology 10: Introductory Geology
Winter Quarter, 2015
GEOL 10 (5.0 units)

Faculty Christopher DiLeonardo, Ph.D.

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(Behind Geology Teaching Lab)
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GEOL 10 Lec Tu, Th 11:30 am to 1:20 pm
GEOL 10.01 Lab Tu 1:30 pm to 4:20 pm
GEOL 10.02 Lab W 11:30 pm to 2:20 pm
GEOL 10.03 Lab Th 1:30 pm to 4:20 pm

Students must attend both lectures and labs each week.

Office Hours Tu, W, Th 10:30 am
W 2:30 pm by appointment only

Course Catalog Description 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.

Student Learning Outcomes (SLOs) and Course Objectives

Student Learning Outcomes are overarching, clear, and assessable statements that identify and define what a student is able to do at the successful completion of a specific course. These outcomes may involve a combination of knowledge, skills/abilities, and/or attitudes that display behavioral evidence that learning has occurred at a specific level of competency.

Student Learning Outcomes (SLOs) for GEOL 10: Introductory Geology

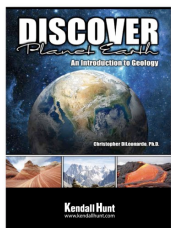
1. Apply the principles of scientific methodology to test hypotheses on how the Earth works as an integrated system.
2. Use data and observations to track and predict changes in the Earth system resulting from dynamic Earth Processes.
3. Use observations from the crust and lithosphere of the Earth to determine geologic history at hand sample, outcrop, local, and regional scales.
4. 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.

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.

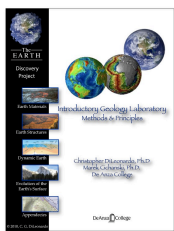
Required Materials



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: *Discover Planet Earth: An Introduction to Geology*, DiLeonardo, Christopher G., Kendall-Hunt Publishing, 2013. ISBN: 978-1-4652-2825-3

Note: Digital Online Textbook, purchase license through the bookstore or Kendall Hunt.



Lab/Activities: These should be downloaded from the online lab manual: *Methods and Principles in Introductory Geology*, v. 1.3, DiLeonardo and Cichanski. The Earth Discovery Project

Note: The online manual is provided online free of charge to students. It is the responsibility of each student to have the proper lab materials with them at each lab session.

Other: Color pencils, 4 pack of Play-Doh and Millimeter scale/ruler

Attendance Policy

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 laboratory may be dropped from the course.

Tardiness

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 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 this course.

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.

Academic Policies

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.

Academic 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.

Cellular Phones, MP3 players (iPODs), Computers

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 Students in Geology 10 must attend the Introductory Field Workshop*. Please see the schedule below for the date and time of the field workshop.**

Waiver of Liability 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.*

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 second ½ of course

50 pts field workshop participation

Area B: Concepts**150 pts.** Concept quizzes (online/textbook assessment)

30 pts Seismology

30 pts Plate Tectonics

30 pts Igneous Rocks

30 pts Depositional Environments

30 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 Mine Challenge (Mineral ID: collaborative)

25 pts Geo Detectives Challenge (Rock Classification: collaborative)

25 pts Geologic Map & Earth Structures Quiz (individual assessment)

Area D: Application & Synthesis**300 pts.** Midterm Exam

150 pts Midterm Exam Part A (take-home)

150 pts Midterm Exam Part B (in-class collaborative assessment)

300 pts. Final Exam*

150 pts Final Exam Part A (take-home)

150 pts Final Exam Part B (in-class individual assessment)

1,000 pts. Total for Course**Final Grade**

Plus	Letter Grade	Minus	Rubric
A+ > 999 pts	A = 895 to 999	A- = 875 to 894	Student displays both a level of knowledge and understanding of Geology & the Earth system superior to the general public.
B+ = 855 to 874	B = 771 to 854	B- = 750 to 770	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.
C+ = 730 to 749	C = 625 to 730		Student demonstrates a basic knowledge and understanding of Geology & the Earth system above that of the general public.
D+ = 605 to 624	D = 520 to 604	D- = 500 to 519	Student does not demonstrate knowledge and understanding of Geology & the Earth system beyond that of the general public.
	F < 500 pts		

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 attend the field trip and be present at the final examination to receive a passing grade for the course.**

Class Schedule Winter 2015

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>	<u>Topic:</u>	<u>Reading</u>
Date / Session	Activity/ Assignment	Discover Planet Earth
01	Prologue: Science & the Earth System	
04/07	<u>Lec:</u> Orientation	
04/09	<u>Lec:</u> The Science and Discovery of the Restless Earth	<i>Concepts in Geology</i> DPE 1.0
Lab Session 01	<u>Lab:</u> No Lab meeting during first week.	
02	A Planet in Motion	
04/14	<u>Lec:</u> Rock & Roll in California: Seismic Surfing <i>*In DPE 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> DPE 9.0*
04/16	<u>Lec:</u> The Plate Tectonic Framework	<i>Tectonic Framework</i> DPE 7.0 & DPE 8.0
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 from online lab manual)	
03	The Heat Within and the Evolving Surface	
04/21	<u>Lec:</u> Plate Tectonic Model & Intro. to Volcanism Concept Quiz: Seismology due Tuesday	<i>Igneous & Metamorphic Processes</i> DPE 4.0
04/23	<u>Lec:</u> Volcanism and Volcanic Hazards	
Lab Session 03-A	<u>Lab:</u> <i>Plate Tectonic Boundaries and Absolute and Relative Plate Motion</i>	
Lab Session 03-B	<u>Lab:</u> <i>Topographic Maps and Visualizing the Earth's Surface</i> (printout lab worksheet from online lab manual)	

WEEK Date / Session	Topic: Activity / Assignment	Reading Discover Planet Earth
04	The Changing Face of the Earth	
04/28	<u>Lec:</u> Streams, Floods and Water on the Surface Concept Quiz: Plate Tectonics due Monday	<i>Surficial Processes</i> DPE 15.0
04/30	<u>Lec:</u> Changing Climates and Landscapes	<i>Surficial Processes</i> DPE 16.0
Lab Session 04	<u>Lab Activity:</u> <i>Modification of a Stream Eroded Landscape by Glaciation</i> (printout lab worksheet from online lab manual) Short lab Period this week.	
05	Mountains Rumble	
05/05	<u>Lec:</u> Mountain Building (Midterm Exam Packet sent out)	<i>Tectonic Framework</i> DPE 11.1
05/07	<u>Lec:</u> Open Lab for Midterm Exam (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

06	The Universe Beneath Each Footstep	
05/12	<u>Midterm Exam</u>	
05/14	<u>Lec:</u> Crystallization and Minerals of the Crust	<i>Concepts in Geology</i> DPE 3.1
Lab Session 06	<u>Lab:</u> <i>Mineral Properties and Identification</i> (printout lab worksheet from online lab manual)	
07	The Record of the Rocks	
05/19	<u>Lec:</u> Silicate Minerals	<i>Concepts in Geology</i> DPE 3.2
05/21	<u>Lec:</u> Rocks that form underground	<i>Igneous & Metamorphic Processes</i> DPE 5.0 & 6.0
Lab Session 07	<u>Lab:</u> <i>Rock Textures and Genesis</i> (bring worksheet back with you to lab)	
08	Pages of Stone	
05/26 & 28	<u>Lec.:</u> Sediments & Sedimentary Environments Concept Quiz: Igneous Rocks due Tuesday	<i>Surficial Processes</i> DPE 12.0 & 13.0
Lab Session 08	<u>Lab:</u> <i>Texture and Genesis of Rocks</i> (printout lab worksheet from online lab manual)	

WEEK Date / Session	Topic: Activity / Assignment	Reading Discover Planet Earth
09	Written in Stone: Reading the Rock Record	
06/02-04	<u>Lec.:</u> Geologic Time & Interpreting Earth History <i>Concept Quiz: Depositional Environments due Tuesday.</i>	<i>Concepts in Geology</i> DPE 2.0
Lab Session 09	<u>Lab:</u> Rock Genesis & Classification <i>Team Challenge: Mine Challenge</i>	
10	Riddles in the Rocks	
06/09	<u>Lec.:</u> Deformation of the Earth's Crust	<i>Tectonic Framework</i> DPE 10.0
03/11	<u>No Class Meetings</u> Field Trip Exchange	
Lab Session 10	<u>No Lab Meeting</u> Field Trip Exchange	
SATURDAY 06/13	Introductory Field Workshop (Required)* <u>Field Exercise:</u> <i>Geologic History of Cliff Exposures at Montara State Beach, California</i> 9:00 am to 12:15 pm	
11	Written in Stone: Application	
06/16	<u>Lec.:</u> Folds, Maps and Cross-Sections Workshop <i>Team Challenge: Geo-detectives Rock Hunt</i>	
06/18	<u>Lec.:</u> Assembling California <i>Concept Quiz: Interpreting Geologic History due Wednesday</i> <i>Proficiency Quiz Geologic Maps & Structures (Quiz)</i>	<i>Tectonic Framework</i> DPE 11.2
Lab Session 11A	<u>Lab Activity:</u> <i>Deformation and Earth Structures</i> (printout lab worksheet from online lab manual)	
Lab Session 11B	<u>Lab Activity:</u> <i>Geologic Maps and Contact Relationships</i> (printout lab worksheet from online lab manual)	
12	FINAL EXAM WEEK	
<u>06/26</u>	FINAL EXAM: GEOL 10: Introductory Geology* Friday, June 26 at 11:30 a.m.-1:30 p.m.	