

*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**  
Summer Quarter, 2015  
GEOL 10.01 (5.0 units)

**Lec: M through Th 9:00 am – 10:50 pm**  
**Lab: M through Th 11:00 am – 12:15 pm**

**Faculty Christopher DiLeonardo, Ph.D.**  
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**Office Hours** Summer 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

**Textbook:** *Visualizing Geology, 2<sup>nd</sup> ed.*, Murck, Skinner and McKenzie, Wiley Publishing

**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 through the class website 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.

**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. 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.

**Cell Phones, iPads, Computers, etc.**

The use of cellular phones, iPads, music players, or other personal electronic devices during lecture or laboratory activities is prohibited. Computers for taking notes or completing activities are allowed, but may not be used for any other purpose.

**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 (take-home and collaborative 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
<b>A+</b> > 999 pts	<b>A</b> = 895 to 999	<b>A-</b> = 875 to 894	Student displays both a level of knowledge and understanding of Geology & the Earth system superior to the general public.
<b>B+</b> = 855 to 874	<b>B</b> = 771 to 854	<b>B-</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.
<b>C+</b> = 730 to 749	<b>C</b> = 625 to 730		Student demonstrates a basic knowledge and understanding of Geology & the Earth system above that of the general public.
<b>D+</b> = 605 to 624	<b>D</b> = 520 to 604	<b>D-</b> = 500 to 519	Student does not demonstrate knowledge and understanding of Geology & the Earth system beyond that of the general public.
	<b>F</b> < 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

Schedule is tentative and subject to change as needed by your professor.

<u>WEEK</u> Date / Session	<u>Topic:</u> Activity / Assignment	<u>Reading</u> Quiz
<b>PART I: THE DYNAMIC EARTH</b>		
<b>01</b>	<b>Prologue: Science &amp; the Dynamic Earth System</b>	
06/29 Lab Session 01	<u>Lec:</u> Orientation and Introductions <u>Lab:</u> Orientation, no lab meeting today.	
06/30 Lab Session 02	<u>Lec:</u> The Science and Discovery of the Restless Earth <u>Lab:</u> The Core: Journey to the Center of the Earth	Concepts in Geology DPE 1.0
07/01 Lab Session 03	<u>Lec:</u> Rock & Roll in California: Seismic Surfing <i>*In DPE 9.0 make sure to click on the button to look</i> <u>Lab:</u> Virtual Earthquake (no lab worksheet)	Tectonic Framework DPE 9.0*
07/02 Lab Session 04	<u>Lec:</u> Plate Tectonics: the Anatomy of Scientific Revolution <u>Lab:</u> Plate Tectonic Boundaries and Absolute and Relative Plate Motions (printout lab worksheet)	Tectonic Framework DPE 7.0
<b>02</b>	<b>The Heat Within</b>	
07/06 Lab Session 05	<u>Lec:</u> Plate Tectonics: the Anatomy of Scientific Revolution, ctnd. <u>Lab:</u> Plate Tectonic Boundaries and Absolute and Relative Plate Motions (bring back lab worksheet)	Concept Quiz 1
07/07 Lab Session 06	<u>Lec:</u> Volcanism and Volcanic Hazards <u>Lab:</u> Topographic Maps and Visualizing the Earth's Surface (printout lab worksheet)	Igneous & Metamorphic Processes DPE 4.0
07/08 Lab Session 07	<u>Lec:</u> Volcanism and Volcanic Hazards <u>Lab:</u> Topographic Maps and Visualizing the Earth's Surface (same worksheet from Session 06)	Concept Quiz 2
07/09 Lab Session 08	<u>Lec:</u> Streams, Floods and Water on the Surface <u>Lab:</u> Evolution of an Integrated Stream System	Surficial Processes DPE 15.0
<b>03</b>	<b>The Changing Face of the Earth</b>	
07/13 Lab Session 09	<u>Lec:</u> Changing Climates and Landscapes <u>Lab:</u> Modification of a Stream Eroded Landscape by Glaciation (printout lab worksheet)	Alternate Reading Topo Quiz

07/14	<u>Lec/Activity: Tectonic Activity and Landform Evolution</u> (printout lab worksheet)	<i>Tectonic Framework</i> DPE 11.1
<b>Lab Session 10</b>	<u>Lab: Tectonic Activity and Landform Evolution</u>	
07/15	<u>Lec/Activity: Midterm preparation</u>	
<b>Lab Session 11</b>	<u>Open Lab for Midterm Examination</u>	
07/16	<u>Lec/Activity: Midterm preparation</u>	
<b>Lab Session 12</b>	<u>Open Lab for Midterm Examination</u>	

## ***PART II: WRITTEN IN STONE***

### **04 The Crystalline Universe**

07/20  
**Lab Session 13** MIDTERM EXAM  
No Lab Session

07/21  
**Lab Session 14** Lec: Crystallization and Minerals of the Crust *Concepts in Geology*  
Lab: Mineral Properties and Identification DPE 3.1  
(printout lab worksheet)

07/22  
**Lab Session 15** Lec: Silicate Minerals *Concepts in Geology*  
Lab: Mineral Properties and Identification DPE 3.2  
(bring lab worksheet back to class)

07/23  
**Lab Session 16** Lec: Rocks that Form Underground *Igneous & Metamorphic*  
Lab: Rock Texture and Genesis *Processes*  
(printout lab worksheet) DPE 5.0 & 6.0

### **05 The Riddle of the Rocks**

07/27  
**Lab Session 17** Lec.: Sediments, Sedimentary Rocks *Surficial Processes*  
and Environments DPE 13.0  
Lab: Rock Genesis and Classification **Mine Challenge**  
(printout lab worksheet)

07/28  
**Lab Session 18** Lec.: Deformation of the Earth's Crust Chap. 9 *Tectonic Framework*  
Lab: Rock Genesis and Classification DPE 10.0  
(printout lab worksheet) **Concept Quiz 3**

08/29  
**Lab Session 19** Lec.: Geologic time *Concepts in Geology*  
Lab: Outcrop Patterns and the Orientation of DPE 2.0  
Strata in the Earth's Crust **Concept Quiz 4**  
*Students will need to bring Play-Doh™ to class.*

08/30  
**Lab Session 20** Workshop: Geologic Maps & Deformation **Concept Quiz 5**  
Lab: Outcrop Patterns, Geometry and Age

*of deformed Strata.* (printout lab worksheet)  
Lab: Contact Relationships and Geologic History  
(printout lab worksheet)

**06**

**Pages of Stone**

08/03

**Lab Session 21**

**Introductory Field Workshop (Required):**  
Field Exercise: Geologic History of Cliff Exposures at  
Montara State Beach, California (worksheet handed out)

08/04

**Lab Session 22**

Lec: Geologic Evolution of California  
Lab: Open Lab for Final Examination

**GeoMap Quiz**

08/05

**Lab Session 23**

Lec: Short discussion and review for final exam.  
Lab: Open Lab for Final Examination

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**Final Exam**

**Section GEOL 10-01** *Note: Do NOT be late for the final exam*

**Thursday 08/06 9:00 am – 10:50 am**

*Bring an appropriate Scantron® and No. 2 pencils to the final exam.*

*\*Students must attend and pass the final exam and participate in the introductory field workshop to receive a passing grade in the class.*

*have a great rest of the Summer!*  
**Dr. D.**