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)

Faculty Christopher DiLeonardo, Ph.D.
Office S14a
Phone (408) 864-8632 email: dileonardo@deanza.edu

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


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*.

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

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*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.

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<th>WEEK</th>
<th>Date / Session</th>
<th>Topic:</th>
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<td>Activity / Assignment</td>
<td>Quiz</td>
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## PART I: THE DYNAMIC EARTH

### 01 Prologue: Science & the Dynamic Earth System

#### 06/29
- **Lec:** Orientation and Introductions
- **Lab Session 01:** Orientation, no lab meeting today.

#### 06/30
- **Lec:** The Science and Discovery of the Restless Earth
- **Lab Session 02:** The Core: Journey to the Center of the Earth

#### 07/01
- **Lec:** Rock & Roll in California: Seismic Surfing  
  
  *In DPE 9.0 make sure to click on the button to look DPE 9.0*
- **Lab Session 03:** Virtual Earthquake (no lab worksheet)

#### 07/02
- **Lec:** Plate Tectonics: the Anatomy of Scientific Revolution  
  
  *Tectonic Framework*
- **Lab Session 04:** Plate Tectonic Boundaries and Absolute and Relative Plate Motions (printout lab worksheet)

### 02 The Heat Within

#### 07/06
- **Lec:** Plate Tectonics: the Anatomy of Scientific Revolution, ctnd.  
  
  *Concept Quiz 1*
- **Lab Session 05:** Plate Tectonic Boundaries and Absolute and Relative Plate Motions (bring back lab worksheet)

#### 07/07
- **Lec:** Volcanism and Volcanic Hazards  
  
  *Igneous & Metamorphic Processes*
- **Lab Session 06:** Topographic Maps and Visualizing the Earth’s Surface (printout lab worksheet)

#### 07/08
- **Lec:** Volcanism and Volcanic Hazards  
  
  *Concept Quiz 2*
- **Lab Session 07:** Topographic Maps and Visualizing the Earth’s Surface (same worksheet from Session 06)

#### 07/09
- **Lec:** Streams, Floods and Water on the Surface  
  
  *Surficial Processes*
- **Lab Session 08:** Evolution of an Integrated Stream System  
  
  *DPE 15.0*

### 03 The Changing Face of the Earth

#### 07/13
- **Lec:** Changing Climates and Landscapes  
  
  *Alternate Reading*
- **Lab Session 09:** Modification of a Stream Eroded Landscape by Glaciation (printout lab worksheet)  
  
  *Topo Quiz*
07/14  Lec/Activity: Tectonic Activity and Landform Evolution  
Tectonic Framework
(printout lab worksheet)  
Lab Session 10  Lab: Tectonic Activity and Landform Evolution  
DPE 11.1

07/15  Lec/Activity: Midterm preparation  
Lab Session 11  Open Lab for Midterm Examination

07/16  Lec/Activity: Midterm preparation  
Lab Session 12  Open Lab for Midterm Examination

PART II: WRITTEN IN STONE

04  The Crystalline Universe

07/20  MIDTERM EXAM  
Lab Session 13  No Lab Session

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

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

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

05  The Riddle of the Rocks

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

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

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

08/30  Workshop: Geologic Maps & Deformation  
Lab: Outcrop Patterns, Geometry and Age  
Lab Session 20  Concept Quiz 5
of deformed Strata. (printout lab worksheet)
Lab: Contact Relationships and Geologic History
(printout lab worksheet)

06  Pages of Stone

08/03  Introductory Field Workshop (Required):
Lab Session 21  Field Exercise: Geologic History of Cliff Exposures at Montara State Beach, California (worksheet handed out)

08/04  Lec: Geologic Evolution of California
Lab Session 22  Lab: Open Lab for Final Examination

08/05  Lec: Short discussion and review for final exam.
Lab Session 23  Lab: Open Lab for Final Examination

Final Exam
Section GEOL 10-01  Note: Do NOT be late for the final exam
Thursday 08/06  9:00 am – 10:50 am
GeoMap Quiz

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.