

Welcome to Geology 10



Geology 10: *Introductory Geology*
Winter Quarter, 2018
GEOL 10 (5.0 units)
GEOL 10.01,0.4 and GEOL 10.62

GEOL 10.01-.02-.03 Lec. M,Tu,W,Th 11:30 am
Lab.: Sec 0.1 Tu, Sec 0.2 W, Sec 0.3 Th 1:30 – 4:15 pm
GEOL 10.62 Tu, Th 6:00 pm to 9:15 pm (Lec & Lab)

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, W, Th, 12:30 to 1:30 pm
M 10:30 to 11:30 am

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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.

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.

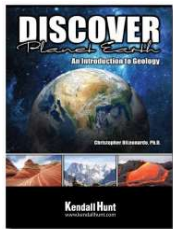
Course Objectives for GEOL 10: Introductory Geology

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.

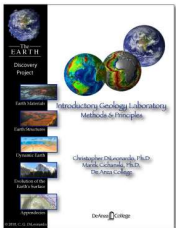
- G. Assemble and synthesize geophysical information in order to assess earthquake hazards and to construct plausible models of the Earth's deep interior.
- H. Synthesize geological, seismological, and paleomagnetic data in order to demonstrate an understanding of global plate tectonics, and predict 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., 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

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 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.

25 pts Earth Science IQ (individual)
 25 pts Seismology
 25 pts Plate Tectonics

25 pts Igneous Rocks
 25 pts Depositional Environments
 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 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 Final Exam Part A (take-home)
 150 pts Final Exam Part B (in-class individual assessment)

300 pts. Final Exam*
 150 pts Final Exam Part A (take-home)
 150 pts Final Exam Part B (in-class individual assessment)

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 | | | |

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 2018

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> | |
| 01/08-09 | <u>Lec:</u> Orientation | |
| 01/10-11 | <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> | |
| 01/15 | Martin Luther King Jr. Holiday: No Class Meeting Monday (day class only) | |
| 01/16-17 | <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* |
| 01/18 | <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) | |
| <hr/> <p>*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.</p> | | |
| <i>03</i> | <i>The Heat Within and the Evolving Surface</i> | |
| 01/22-23 | <u>Lec:</u> Plate Tectonic the Anatomy of a Scientific Revolution Concept Quiz: <i>Seismology</i> due Tuesday | <i>Tectonic Framework</i> Chap. 8.0 |
| 01/24-25 | <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</i> | Chap. 4.0 |

and Relative Plate Motion

| WEEK | Topic: | Reading |
|--|--|--|
| Date / Session | Activity/ Assignment | Discover Planet Earth |
| Lab Session 03-B <u>Lab: Topographic Maps and Visualizing the Earth's Surface</u> (printout lab worksheet from online lab manual) | | |
| <i>04</i> | <i>The Changing Face of the Earth</i> | |
| 01/29-30 | <u>Lec: Streams, Floods and Water on the Surface</u> Concept Quiz: Plate Boundaries due Tuesday | <i>Surficial Processes</i> Chap. 15.0 |
| 01/31-02/01 | <u>Lec: Changing Climates and Landscapes</u> | <i>Surficial Processes</i> Chap. 16.0 |
| Lab Session 04-A | <u>Lab Activity: Evolution of an Integrated Stream System</u> (printout lab worksheet from online lab manual) | |
| Lab Session 04-A | <u>Lab Activity: Modification of a Stream Eroded Landscape by Glaciation</u> (printout lab worksheet from online lab manual) <i>Proficiency Quiz Topographic Maps</i> | |
| <i>05</i> | <i>The Mountains Rumble</i> | |
| 02/05-06 | <u>Lec: Mountain Building</u> Midterm Exam Packet <i>Game of Stones Part I</i> sent out | <i>Tectonic Framework</i> Chap. 11.1 |
| 02/07-08 | <u>Lec: Open Session for Midterm Exam Prep</u> (Bring Midterm Exam Packet with you to class meeting) | |
| Lab Session 05 | <u>Lab Activity: Tectonic Activity and Landform Evolution</u> (printout lab worksheet from online lab manual) | |
| PART II: WRITTEN IN STONE | | |
| <i>06</i> | <i>The Universe Beneath Each Footstep</i> | |
| 02/12 | <u>Prep for Midterm Exam</u> <i>Day class only.</i> | |
| 02/13 | <u>Midterm Exam</u> | |
| 02/14-16 | <u>Lec: Crystallization and Minerals of the Crust</u> | <i>Concepts in Geology</i> Chap. 3.0 |
| Lab Session 06A | <u>Lab: No lab meeting Tu (Night Class Only).</u> shortened lab for all Day Sections. | |
| Lab Session 06B | <u>Lab: Mineral Properties and Identification</u> (printout lab worksheet and bring to lab) | |
| <i>07</i> | <i>The Record of the Rocks</i> | |
| 02/19 | President Day Holiday: No Class Meeting Monday (day class only) | |

| | | |
|------------------------|---|--|
| 02/20 | <u>Lec:</u> Rocks that form underground | <i>Igneous & Metamorphic Processes</i> |
| 02/21-22 | <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> | <u>Topic:</u> | <u>Reading</u> |
| Date / Session | Activity/ Assignment | Discover Planet Earth |
| <i>08</i> | <i>Pages of Stone</i> | |
| 02/26-27 | <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 |
| 02/28-03/01 | <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> | |
| 03/05-06 | <u>Lec.:</u> Deformation of the Crust | <i>Tectonic Framework</i> Chap. 10.0 |
| 03/07-08 | <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:</u> <i>Rock Genesis & Classification</i> (printout lab worksheet and bring to lab) | |
| Lab Session 09B | <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) | |
| <i>10</i> | <i>Written in Stone</i> | |
| 03/12-13 | <u>Lec.:</u> Geologic Time & Interpreting Earth History, ctnd. | |
| 03/14-15 | <u>Lec.:</u> Geologic Evolution of California | |

Lab Session 10A Lab Activity: *Outcrop Patterns and Age Relationships of Folded Strata.*
(printout lab worksheet and bring it to lab)
Team Challenge: Geo-detectives Rock Hunt

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

SATURDAY
03/17

Introductory Field Workshop (Required)*
Field Exercise: *Geologic History of Cliff Exposures at Montara State Beach, California* 9:00 am to 12:15 pm

WEEK

Date / Session

Topic:

Activity/ Assignment

Reading

Discover Planet Earth

11*The Game of Stones*

03/19-20

Lec.: No Class Field Trip Exchange

03/21-22

Lec.: Prep for Final Exam.*Concept Quiz: Interpreting Geologic History due***Lab Session 11**Lab Activity: **No Lab Field Trip Exchange****12***Final Exam***FINAL EXAM SCHEDULE: GEOL 10**03/26**GEOL 10 Sec. 01, 02, 03 Day Class**

Monday: 11:30 a.m.-1:20 p.m.

03/27**GEOL 10 Sec. 62 Night Class**

Tuesday Evening: 6:00 p.m.-7:50 p.m.

*Enjoy your spring break.
Dr. D.*

***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.**

- 6. 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.