

PHYSICAL GEOLOGY

Description

An introduction to geology, minerals, rocks, plate tectonics, geological processes, landforms, and structural geology. A field trip will be required.

Rationale

As the world's population grows and expands, humans are placing a greater demand on Earth resources, encountering natural hazards more frequently, and are the primary cause for our rapidly changing climate. To make educated decisions about these changes, consumers, voters, and decision-makers must understand how the Earth system works and how scientists have obtained this knowledge. Studying physical geology provides a valuable perspective for this understanding. This course is designed to give a basic understanding of geology and geological techniques for both geology and non-geology majors.

Objectives

- Learn to read, interpret, and comprehend scientific information
- Review basic concepts of mathematics, chemistry, physics, and geography as applied to geology
- Learn to make scientific observations and ask meaningful questions about the Earth
- Develop the ability to identify and interpret Earth materials, processes and features
- Understand how geoscientists investigate Earth systems
- Conduct academic inquiry in a safe and professional manner

Outcomes

Course-Level - upon successful completion of this course, students will be able to:

- describe the scientific method and apply it in a geological context
- describe Earth's major systems and explain how they interact
- identify common rocks and minerals and interpret how they form
- describe and interpret the development of landforms and geologic structures
- construct and interpret geologic and topographic maps, cross-sections, and topographic profiles
- describe the major sources of water, soil, and sediment pollution, and methods for their management
- explain the theory of plate tectonics and its relationship to Earth processes, features, and landforms

Program-Level - as an Associate of Science in Geology required course, students will be able to:

- describe and explain processes and features within the Earth, particularly with regard to plate tectonics and the resulting geologic structures
- describe and explain processes operating on the surface of the Earth and the resulting landforms and features
- identify common rocks and minerals
- interpret and construct topographic maps, and geologic maps and cross-sections

General Education - as a Core Curriculum course, students completing this course will demonstrate competence in:

- critical thinking in the gathering, analyzing, synthesizing, evaluating and applying information
- quantitative and empirical reasoning through the application of mathematical, logical and scientific principles and methods

Instructional Methods

This course will be taught in illustrated lecture, discussion, lab exercise, and field investigation formats. Student learning will be assessed through graded lab exercises, exams covering lecture and field activity content, and through practical quizzes on lab exercises.

Registration

Section 34044 - Lecture- 12:00-1:20 P.M. Tues. and Thurs. in NRG Rm. 2213

Lab- 1:30-2:50 P.M. Tues. and Thurs. in NRG Rm. 2228

Prerequisites - One year of high school science, and reading and mathematics proficiency on Texas Success Initiative (TSI) testing or have a TSI exemption/waiver

Required Textbooks

Grotzinger, John, P., and Jordan, Thomas H. 2014. *Understanding Earth (seventh edition)*: New York, NY, W. H. Freeman and Co., 672 p., ISBN 978-1-4641-3874-4

Ludman, Allan, and Marshak, Stephen, 2015. *Laboratory manual for introductory geology (third edition)*: New York, W. W. Norton & Company, 456 p., ISBN 978-0-393-93791-6 (paper only).

Course Equipment and Supplies

The following equipment and supplies are either required (req.) or optional (opt.):

No. 2 pencil or a mechanical pencil (req.)	Calculator (opt.) (no phones or computers for quizzes)
Pencil eraser (e.g. Staedtler Mars plastic) (req.)	3-ring notebook (opt.)
Green Scantron forms (3 ea.) (req.)	Drafting compass (opt.)
Colored pencils - set of at least 10 colors (opt.)	Hand lens (10X pocket magnifier) (opt.)
12" Metric/English ruler or triangular scale (opt.)	Rock pick with metal handle (opt.)
Protractor (opt.)	Vented safety goggles (ANSI Z87.1) (opt.)

Laboratory

It is very important to attend all of the lab sessions. You should read the assigned pages in your lab manual before you come to class so that you can complete the exercise in the allotted time. Most exercises will be due one week after they are assigned, however some will be due on the day that they are assigned or by the end of the next lab session. Students who miss a lab, or need extra time, should plan on attending an open-lab session. Open laboratory sessions will be held in NRG Room 2228 and at other ACC campuses on Fridays; see <http://sites.austincc.edu/ees/about-geology/open-labs/> for details. You must bring your own copy of the lab exercise to an open-lab session.

Field Trip

You must participate in a mandatory class field trip which will depart the Northridge Campus at 8:00 A.M. on Saturday, October, 28, 2017. Transportation will be provided and the trip should return by 6:30 P.M. You must participate in an ACC physical geology field trip to pass this course. Department policy states that students who do not attend the required field trip will fail the class. If you cannot attend the trip on October 28, you must make arrangements in advance to participate in another professor's GEOL 1403 field trip. Do not assume that if you miss the field trip that you will be able to make it up.

Communication

Professor: Robert (Bob) H. Blodgett, Ph.D., P.G., Professor

Office Hours: 10:30 AM-Noon Tuesday and 4:20-5:05 PM Tuesday and Thursday, or by appointment, in NRG Room 2216; 10:30 AM-Noon on Monday and Wednesday in HLC Room 2106

Telephone/ voice mail: 512-223-4276

Electronic mail: [rblodget @ austincc.edu](mailto:rblodget@austincc.edu) - checked at least daily Monday through Friday;

You are expected to check your ACCmail account regularly during the work week.

Web page: www.austincc.edu/rblodget

Assessment and Grading

Exams and Quizzes

Three graded, in-class, closed-book lecture exams will contain varying combinations of multiple-choice, matching and short-answer questions drawn from lectures, handouts, reading assignments, and field activities. A final lecture exam will be given on the last day of class and will emphasize material covered since the last mid-term exam. Four graded, in-lab practical quizzes will contain questions about samples of Earth materials, maps and photographs, as well as short-answer questions about terminology and methodology. No exams or quizzes will be given early. If a single exam is missed, the score on the final exam will be given for the missed exam. Scores of 70 or greater on the final exam will substitute for the lowest mid-term exam score. Review sheets will be distributed before each exam and quiz.

Grading

Your final course average will be calculated as follows:

10% - Graded lab and field exercises	46% - Two mid-term lecture exams (each counts 23%)
16% - Four lab quizzes (each counts 4%)	28% - Final lecture exam

There is no "extra credit." You must notify your professor of any mistakes or disagreements in scoring within one week after a corrected exam, quiz or assignment has been returned. The following scale will be used to determine your course grade: 90-100% = A; 80-89% = B, 70-79% = C, 60-69% = D and below 60% = F. Students whose final course average is 59%, 69%, 79%, or 89% will be advanced to the next higher grade if their final lecture exam shows improvement over their mid-term lecture exam scores.

Course Policies

Participation and Assignments

You are expected to attend all lectures and lab sessions, participate in class discussion, and work with your professor and classmates to learn the course content. This may include distributing and collecting course materials, setting up and logging off of computers, participating in demonstrations, and cleaning up after lab and field activities. Assignments turned in late will be penalized 4 points each calendar day; however, it is better to turn an assignment in late than to receive no points for the work. Late assignments must be submitted to Professor Blodgett's mailbox in NRG Rm. 1107 with the date stamped on them by the mail room assistant. Late work will not be accepted after an assignment has been returned.

Withdrawals

If you decide to drop this class, you must protect your academic record by withdrawing no later than Monday, November 27, 2017. You must print out confirmation of your withdrawal to verify its completion. The professor reserves the right to withdraw a student for not complying with course/ACC policies or for not meeting course objectives. Departmental policy forbids the professor from withdrawing you after November 27, 2016. State law permits students to withdraw from no more than 6 courses during their entire undergraduate career at Texas public colleges or universities. With certain exceptions, all course withdrawals automatically count towards this limit. Students who enroll for the third or subsequent time in a course taken since Fall 2002, may be charged higher tuition for that course. Details on this policy can be found in the ACC Catalog: www.austincc.edu/catalog.

Incomplete Grade

An incomplete (grade of "I") will be given only if extenuating circumstances, such as illness or death of a loved one, prevent a student from completing the final exam or final lab quiz. Incompletes must be requested in writing with documentation of the circumstances. If a grade of I is given, the final exam or final lab quiz must be taken no later than April 2, 2018.

See the attached "ACC Academic Policies and Services" for additional policies

Studying

Science courses, especially those with lab and field exercises, generally require a different approach to studying than other courses. In this course you will be asked to conceptualize things in three dimensions, understand complex concepts, and learn a whole new vocabulary for describing your planet. You will improve your performance if you:

- read each textbook chapter
- review the chapter summary
- take notes by hand from both the textbook and lecture
- answer the exercise questions
- learn the key terms and concepts in assigned chapters

Many students find it useful to make flash cards with the definitions and geologic significance of terms, and to form study groups with their classmates. You may also benefit from viewing the animations on the Media Support page at the end of each textbook chapter. Many students underestimate the amount of time needed to pass this course. At a minimum, you should spend 2 hours outside of class studying for every hour in class. A free tutor may be available at an ACC Learning Lab; check <http://sites.austincc.edu/ees/tutoring-and-learning-labs/> after the first week of classes for locations and times.

Etiquette

You are expected to be seated and ready for class on time and not leave your seat during lecture or lab introductions. Take a seat near the door if you arrive late or need to leave early. Please notify the professor if you have to arrive late or leave early on a regular basis. As a common courtesy, do not interrupt the professor or classmates when they are speaking, do not carry on conversations during lectures or lab introductions, and please turn off audible alarms on electronic equipment. Departmental policy prohibits the use of personal laptop computers in the classroom. Texting or telephone conversations are only allowed at designated times during class, lab, and field activities - you are expected to focus on course content and not multi-task.

GEOL 1403 COURSE SCHEDULE*

Date	Lecture Topic	Text	Lab or Field Exercise	Lab Manual
Aug. 29	Introduction	1	Earth Systems lecture	-
Aug. 31	Interior of the Earth	14	Interior of the Earth lecture / Lab safety	-
Sept. 5	Earthquakes	13	Geography, Math and Chemistry Review	1
Sept. 7	Plate Tectonics	2	Earthquakes	16
Sept. 12	Plate Tectonics	2	Minerals lecture	-
Sept. 14	Minerals	3	Plate Tectonics	2
Sept. 19	Rock & Tectonic Cycles	3	Mineral Properties	3
Sept. 21	Igneous Rocks	4	Mineral Identification	3
Sept. 26	Volcanoes	12	Mineral Identification	3
Sept. 28	Sedimentation & Sedimentary Rocks	5	Igneous Rock	5
Oct. 3	Sedimentary Environments	5	Igneous Rocks	5
Oct. 5	Exam 1 (Chap. 1-4, 12-14)	-	Sedimentary Rocks	6
Oct. 10	Metamorphism	6	Quiz 1 (earthquakes, tectonics, minerals, review)	-
Oct. 12	Metamorphic Rocks	6	Sedimentary & Metamorphic Rocks	6, 7
Oct. 17	Geochronology	8	Metamorphic Rocks	7
Oct. 19	Structural Geology	7	Rock Review	5, 6, 7
Oct. 24	Geologic Evolution of the Continents	10	Relative Dating	17
Oct. 26	Weathering and Soils	16	Contour Mapping	8, 9
Oct. 28	Hill Country Field Trip		Hill Country Field Trip	-
Oct. 31	Mass Wasting	16	Topographic Profiles and Maps	9
Nov. 2	Groundwater	17	Geologic Structures	15-
Nov. 7	Streams	18	Quiz 2 (rocks, relative dating)	15
Nov. 9	Winds and Deserts	19	Geologic Maps	-
Nov. 14	Exam 2 (Chap. 5-8, 10, 16, 17)	-	Groundwater	12
Nov. 16	Oceans and Coastlines	20	Stream Erosion and Deposition	10
Nov. 21	Glaciers	21	Arid Environments	13
Nov. 23	Thanksgiving	-	No Classes	-
Nov. 28	Landscape Development	22	Quiz 3 (topographic maps & profiles, geologic maps & structures)	-
Nov. 30	Energy Resources	23	Shoreline Landscapes	14
Dec. 5	Energy and Mineral Resources	23, 3	Glacial Landscapes	11
Dec. 7	Global Climate Change	15, 23	Global Climate Change Lecture	-
Dec. 12	Quiz 4 (geomorphology)	-	Review	-
Dec. 14	Final Exam (Chap. 3, 15, 18-23)	-	Course Assessment	-

*Schedule changes may occur during the semester and will be announced in class.

ACC POLICIES AND SERVICES

Attendance/Class Participation: Regular and punctual class attendance is expected of all students. If attendance or compliance with other course policies is unsatisfactory, the instructor may withdraw students from the class.

Incompletes: An instructor may award a grade of “I” (Incomplete) if a student was unable to complete all of the objectives for the passing grade in a course. An incomplete grade cannot be carried beyond the established date in the following semester. The completion date is determined by the instructor but may not be later than the final deadline for withdrawal in the subsequent semester.

Statement on Scholastic Dishonesty: A student attending ACC assumes responsibility for conduct compatible with the mission of the college as an educational institution. Students have the responsibility to submit coursework that is the result of their own thought, research, or self-expression. Students must follow all instructions given by faculty or designated college representatives when taking examinations, placement assessments, tests, quizzes, and evaluations. Actions constituting scholastic dishonesty include, but are not limited to, plagiarism, cheating, fabrication, collusion, and falsifying documents. Penalties for scholastic dishonesty will depend upon the nature of the violation and may range from lowering a grade on one assignment to an “F” in the course and/or expulsion from the college. See the Student Standards of Conduct and Disciplinary Process & other policies at <http://www.austincc.edu/current-students>.

Student Rights and Responsibilities: Students at the college have the rights accorded by the U.S. Constitution to freedom of speech, peaceful assembly, petition, and association. These rights carry with them the responsibility to accord the same rights to others in the college community and not to interfere with or disrupt the educational process. Opportunity for students to examine and question pertinent data and assumptions of a given discipline, guided by the evidence of scholarly research, is appropriate in a learning environment. This concept is accompanied by an equally demanding concept of responsibility on the part of the student. As willing partners in learning, students must comply with college rules and procedures.

Statement on Students with Disabilities: Each ACC campus offers support services for students with documented disabilities. Students with disabilities who need classroom, academic or other accommodations must request them through the Student Accessibility Services (SAS) office. Students are encouraged to request accommodations when they register for courses or at least three weeks before the start of the semester, otherwise the provision of accommodations may be delayed. Students who have received approval for accommodations from SAS for this course must provide the instructor with the ‘Notice of Approved Accommodations’ from SAS before accommodations will be provided. Arrangements for academic accommodations can only be made after the instructor receives the ‘Notice of Approved Accommodations’ from the student. Students with approved accommodations are encouraged to submit the ‘Notice of Approved Accommodations’ to the instructor at the beginning of the semester because a reasonable amount of time may be needed to prepare and arrange for the accommodations. Additional information is available at <http://www.austincc.edu/sas>.

Safety Statement: ACC is committed to providing a safe and healthy environment for study and work. You are expected to learn and comply with ACC environmental, health and safety procedures and agree to follow ACC safety policies. Additional information on these can be found at <http://www.austincc.edu/ehs>. Because some health and safety circumstances are beyond our control, we ask that you become familiar with the Emergency Procedures poster and Campus Safety Plan map in each classroom. Additional information about emergency procedures and how to sign up for ACC Emergency Alerts to be notified in the event of a serious emergency can be found at <http://www.austincc.edu/emergency/>. Please note, you are expected to conduct yourself professionally with respect and courtesy to all. Anyone who thoughtlessly or intentionally jeopardizes the health or safety of another individual will be dismissed from the day’s activity, may be withdrawn from the class, and/or barred from attending future activities.

Concealed Handgun Policy: The ACC concealed handgun policy ensures compliance with Section 411.2031 of the Texas Government Code (also known as the [Campus Carry Law](#)), while maintaining ACC’s commitment to provide a safe environment for its students, faculty, staff, and visitors. Beginning August 1, 2017, individuals who are licensed to carry (LTC) may do so on campus premises except in locations and at activities prohibited by state or federal law, or the college’s concealed handgun policy. It is the responsibility of license holders to conceal their handguns at all times. In addition, concealed weapons are not allowed on ACC-sponsored field trips where the school owns or has chartered or leased vehicles for transportation. Persons who see a handgun on campus are asked to contact the ACC Police Department by dialing 222 from a campus phone or 512-223-7999. Refer to the concealed handgun policy online at austincc.edu/campuscarry.

Use of ACC email: All College e-mail communication to students will be sent solely to the student’s ACCmail account, with the expectation that such communications will be read in a timely fashion. ACC will send important information and will notify you of any college related emergencies using this account. Students should only expect to receive email communication from their instructor using this account. Likewise, students should use their ACCmail account when communicating with instructors and staff. Instructions for activating an ACCmail account can be found at <http://www.austincc.edu/accmail/>.

Testing Center Policy: Under certain circumstances, an instructor may have students take an examination in a testing center. Students using the Academic Testing Center must govern themselves according to the Student Guide for Use of ACC Testing Centers and should read the entire guide before going to take the exam. To request an exam, one must have an ACC Photo ID, the Course Abbreviation and Course Number, the Course Synonym, the Course Section, and the Professor's Name. Do NOT bring cell phones to the Testing Center. Having your cell phone in the testing room, regardless of whether it is on or off, will revoke your testing privileges for the remainder of the semester. ACC Testing Center policies can be found at <http://www.austincc.edu/testctr/>.

Student and Instructional Services: ACC strives to provide exemplary support to its students and offers a broad variety of opportunities and services. Information on these services and support systems is available at <http://www.austincc.edu/current/>. ACC Learning Labs provide free tutoring services to all ACC students currently enrolled in the course to be tutored. The tutor schedule for each Learning Lab may be found at <http://www.austincc.edu/tutor>. A Learning Lab Technician at any ACC Learning Lab can provide you with help setting up your ACCeID, ACCmail, or ACC Blackboard.