

GEOS 100 – FUNDAMENTALS OF GEOLOGY

Spring Semester, 2016

COURSE INFORMATION

Instructor: Dr. Samuel D. Matson

Email: sammatson@boisestate.edu

Phone: (208) 426–3645

Website: <http://earth.boisestate.edu/sammatson>

Office Hours: Tu 12:00 – 2:00 pm and by appt.
1162 ERB or ACCS 205A

Course Website: <http://blackboard.boisestate.edu>

Course Text: Grotzinger and Jordan, 2014, *Understanding Earth*, W.H. Freeman, ISBN: 1464195560 (7th ed.), 1429269545 (6th ed.)

Course Dates: 12 January – 28 April 2016

Lecture Time/Location: TuTh 9:00–10:15 am, 113 Math Bldg.

Lab Times and Locations

Lab Instructor(s)

Lab A: Tuesdays 10:30 am – 12:30 pm, ACCS 209	Gabe Garcia (gabrielgarcia430@u.boisestate.edu) Buchanan Kerswell (buchanankerswell@u.boisestate.edu)
Lab C: Tuesdays, 1:30 – 3:30 pm, ACCS 209	Gabe Gribler (gabegribler@u.boisestate.edu)
Lab D: Tuesdays, 6:00 – 8:00 pm, ACCS 209	John Shuler (johnshuler@u.boisestate.edu)
Lab B: Wednesdays, 10:30 am – 12:30 pm, ACCS 209	Gabe Garcia (gabrielgarcia430@u.boisestate.edu) Buchanan Kerswell (buchanankerswell@u.boisestate.edu)

COURSE DESCRIPTION

Geology is the scientific study of the Earth system at various scales of time and space. The Earth is a constantly changing body; while many of these changes take place on time scales that are too long for most people to recognize, they nonetheless have a significant impact on our everyday lives. In this course, students will explore Earth's materials, the dynamic processes through which these materials are cycled, and the interaction of Earth's geological and biological systems. Specific topics this course will address include plate tectonics, rocks and minerals, volcanoes, earthquakes, weathering, rivers and groundwater, glaciers, topographic and geologic maps, and Earth history.

LEARNING OUTCOMES

Boise State's Foundational Studies Program provides undergraduates with a broad-based education that spans the entire university experience. *GEOS 100: Fundamentals of Geology* satisfies four credits of the Foundational Studies Program's Disciplinary Lens – Natural, Physical, and Applied Science (DL-N) requirement. It supports the following University Learning Outcome, along with a variety of other course-specific goals:

8. Apply knowledge and the methods characteristic of scientific inquiry to think critically about and solve theoretical and practical problems about physical structures and processes.

GEOS 100: Fundamentals of Geology is designed help students understand the processes shaping the physical world around them, through the perspective of a geologist. This course helps to achieve the goals of the Foundational Studies Program by focusing on the following course learning outcomes. After successful completion of this course, you will be able to:

- 1) develop and articulate a question based on relevant geologic observations, 2) describe parallel, testable hypotheses that explain your observations, 3) design a simple experiment to test each hypothesis, and 4) evaluate the results of the experiment to decide which hypotheses are supported by the data.
- clearly differentiate between observation and interpretation of geologic data, and summarize and relate observations in order to support an interpretation.
- clearly and accurately apply scientific terms and principles to construct organized and concise written, oral, and graphical communication about important ideas such as plate tectonic theory, the rock cycle and classification of Earth materials, geologic time, mountain building and geologic structures, and surficial processes.
- describe the primary ways in which humans depend on Earth materials and are affected by geologic processes, and explain how scientific understanding about these processes has a direct impact on societal wellbeing.
- describe the physical processes that shape the Earth's surface today, and explain how reading the rock record can help us to identify such processes that have operated in the past.

COURSE ORGANIZATION AND GRADING CRITERIA

Your final grade will be based on points that you have earned on exams, reading quizzes, homework and in-class activities, laboratory activities, lecture and lab exams, and a final lab presentation. The weight of each of these assessments in your final grade is as follows:

Assessment Category	Percent of Grade
Reading Quizzes (11)	10%
Exam 1	5%
Exam 2	10%
Final Exam	15%
Homework and In-class Activities (?)	20%
Labs (10)	30%
Lab Final Exam	5%
Lab Presentation	5%

At the end of the semester, I will evaluate the total percentage you have earned on the assessments above and will determine your final letter grade as follows:

A	92 – 100%	B	82 – 87%	C	72 – 77%	D	62 – 67%
A–	90 – 91%	B–	80 – 81%	C–	70 – 71%	D–	60 – 61%
B+	88 – 89%	C+	78 – 79%	D+	68 – 69%	F	<60%

Your grade for this course is *non-competitive*, and will be determined by how you perform on course assessments – not how you perform relative to your peers. **There will be no extra-credit opportunities, so please do not ask.**

Textbook Assignments and Reading Quizzes (RQ)

You will be expected to read the assigned chapters from the textbook and/or review other materials on your own prior to each lecture. This course does not focus explicitly on the textbook, but keeping up with the reading will help you become familiar with vocabulary and concepts and will greatly enhance what you take away from each lecture and lab exercise. There will be 12 Reading Quizzes (RQs) throughout the semester, delivered online via Blackboard. These quizzes will be based on the textbook reading assignments and/or other assigned materials, and their purpose is to help you prepare for class by encouraging you to complete the assigned readings and giving you feedback on your understanding of concepts before coming to lecture. The RQs will be due at the beginning of lecture on Tuesday for weeks in which there is not an exam, and they will be available for one week prior to that time. **Each quiz is an individual effort**; you are welcome (and encouraged) to use your textbook, but NOT your fellow classmates. Quizzes are not cumulative and will cover material since the last quiz. You can take each quiz up to 2 times, and I will record your highest score. **No make-ups are allowed on the quizzes**, but I will drop your lowest reading quiz score when calculating your final grade. Please interpret this policy wisely.

Exams

There will be three lecture exams in this class – 2 midterms and 1 final. All three exams will be delivered online via Blackboard at the Testing Center on the main campus in Boise (418 Education Building). You will need to sign up for a time slot with the Testing Center prior to the exam (a link is provided on the course website), and you will need to bring a photo ID to the Testing Center at that arranged time to take the exam. **You are strongly encouraged to sign up for exam slots early in the semester**, since the Testing Center schedule fills very quickly. **It is extremely unlikely that you will be able to make up a missed exam**, so scheduling your exam for the last time slot on the last day of the exam availability period is probably a bad idea. Scheduling your exam early in the week increases the chances that you will be able re-schedule in the event that you miss your exam due to unforeseen and/or emergency circumstances.

Each exam will be *roughly* 40% cumulative material since the beginning of the semester, and *roughly* 60% new material since the last exam. The exams will use a combination of multiple choice, word/definition matching, picture and graph identification, and calculation and/or short answer questions to assess your recall and understanding of material from lectures and lab, as well as your ability to apply geologic concepts and to synthesize and evaluate geologic data.

Homework and In-class Activities (ICA)

Throughout the semester, there will be several activities and assessments in lecture that are designed to 1) illustrate and reinforce concepts introduced in lecture, 2) promote student interaction (and alertness!), and 3) provide immediate feedback of student understanding of important concepts to both the students and the instructor. These activities will comprise 20% of your final course grade, and include (but are not limited to) short in-class quizzes using student response technology (“clickers”), brief in-class assignments, essays or sketches, and/or take-home homework assignments. Though some quizzes may contain questions that will be graded as right/wrong, the majority of your grade for homework and in-class activities will be based on participation and effort. **No make-ups are allowed for missed in-class activities**, but I will drop your lowest 2 ICA scores when calculating your final grade. Interpret this policy wisely. If you must miss a lecture, you are responsible for getting the notes from a classmate and ensuring you understand the material you missed.

Laboratory Exercises

The laboratory exercises are hands-on, in-class activities designed to illustrate and reinforce (and sometimes introduce!) concepts we discuss in lecture. The laboratory exercises will comprise 30% of your final course grade. Please interpret this policy wisely. Each Lab exercise will consist of three components:

- 1) A short pre-lab quiz via Blackboard designed to make you more efficient with your time in lab by encouraging you to read the lab handout ahead of time. **Pre-labs will be due (via Blackboard) at the beginning of your lab period**, and will comprise 5% of the total grade for each lab exercise.
- 2) Lab worksheets, consisting of a series of questions, graphs, tables and/or other work that you will complete during the lab period. **Completed Lab worksheets will be due at the end of each lab period**, and will comprise 85% of the total grade for each lab exercise.
- 3) A short post-lab quiz via Blackboard designed to 1) give you immediate feedback about your understanding of important concepts before you leave lab, 2) encourage dialogue between you and your lab instructor about those concepts, and 3) help you prepare for the lab final exam. **Post-labs will be due by 11:59 pm on Friday the week of the corresponding lab**, but you are strongly encouraged to complete them during the lab period or immediately after. You are welcome to consult with your lab partners as you are completing the post-labs, but keep in mind that you will NOT be able to consult with your classmates during the lab final exam – so completing them on your own would probably be better practice for that exam. The post-labs will comprise 10% of the total grade for each lab exercise.

If you must miss your scheduled lab, then you are strongly encouraged to contact the instructor of another lab section to see if there is room for you to attend that lab. (Keep in mind that we are limited in terms of lab space and supplies, so you are NOT guaranteed a spot in a lab section for which you are not enrolled.) **No make-ups are allowed for missed labs (including pre-labs and post-labs)**, but I will drop your lowest lab score when calculating your final grade. Interpret this policy wisely. If you must miss a lab it is important that you master the skills and concepts in order to perform well on the lab exam.

Laboratory Exam

There will be one cumulative final exam in the laboratory portion of this class, to be held during your lab period the week of 19–20 April (Week 15). **The lab exam is an individual effort** and will comprise 5% of your final course grade. The lab exam is designed to test your understanding of important lab concepts, and your ability to apply those concepts to synthesize and evaluate geologic data.

Lab Final Presentation

Each lab section will be divided into groups of 2–3 students, and each group will be responsible for investigating the geology of a specific region of Idaho and presenting their findings to fellow GEOS 100 students via a 10-minute video presentation in lab during Week 16 of the semester (26–27 April). The lab presentation will comprise 5% of your final course grade. Presentation topics, introductory questions, and assessment criteria are available in your lab manual.

- 1) **Academic Dishonesty:** Academic integrity is essential to a positive teaching and learning environment, and scholastic dishonesty is considered unacceptable in any form in this course. All students enrolled in University courses are expected to complete coursework responsibilities with fairness and honesty. Failure to do so by seeking unfair advantage over others or misrepresenting someone else’s work as your own, can result in disciplinary action. As described in Article 4, Section 1 of Boise State University’s Student Code of Conduct:

A violation may include cheating, plagiarism, or other forms of academic dishonesty. All assignments submitted by a student must represent her/his own ideas, concepts, and current understanding or must cite the original source. Academic dishonesty includes assisting a student to cheat, plagiarize, or commit any act of academic dishonesty. Attempts to violate academic integrity do not have to be successful to be considered academic dishonesty. Academic dishonesty includes turning in substantial portions of the same academic work to more than one course without the prior permission of the faculty members.

In this course, academic dishonesty also includes (but is not limited to) lying about any aspect of your performance or participation in the course, using a classmate’s clicker to submit answers for him/her, allowing a classmate to submit clicker responses on your behalf, consulting another student’s exam, quiz, or laboratory materials from a previous semester, and/or making your exam, quiz, or lab materials available to another student after the conclusion of this semester. If you have any questions regarding the expectations for a specific assignment or exam, ask. **Any student responsible for academic dishonesty in GEOS 100 can be assigned a penalty up to and including an “F” for the course.** Example penalties for various forms of academic dishonesty in GEOS 100 include:

Infraction	Sanction
Completing part or all of an in-class activity (e.g., clicker questions, written activity) on behalf of another student	<i>First offense:</i> Student(s) receive zero credit for the assignment. <i>Second offense:</i> Student(s) receive zero credit for all in-class activities for the semester (20% of final grade).
Copying part or all of another student’s quiz/exam.	<i>First offense:</i> Student(s) receive zero credit for the quiz/exam. <i>Second offense:</i> All students involved fail the course.
Plagiarizing published material on Lab Presentation	All group members receive zero credit for the presentation.
Any and all of the above	<i>Instructor files Academic Dishonesty Report Form with the Office of the Dean of Students.</i>

- 2) **Attendance:** Class attendance is essential. In the vast majority of circumstances, late work is not accepted and class assignments and lab activities cannot be made up. Much of the class is based on activities and discussions, which require full attention and participation. Please be prompt and ready to begin at the start times for your lecture and lab sections.
- 3) **Accommodations:** If you have any physical or learning needs that might impact your learning and evaluation in this course, please discuss these needs with your instructor **at the beginning of the term**. The University has a multitude of resources so don’t hesitate to let your instructor help you. *To request academic accommodations for a disability, contact the Disability Resource Center, Admin 114, (208) 426–1583. Students are required to provide documentation of their disability and meet with a Disability Specialist prior to receiving accommodations. Information about a disability or health condition will be regarded as confidential.*
- 4) **Communication:** If you have something important to tell your instructor (i.e. you’ll be late, absent, etc.), send an email reminder. Telling your instructor after class and hoping he/she will remember is not a good option. You must notify your instructor(s) well in advance of any travel plans for university-sponsored events (athletics or other activities) that will interfere with the scheduled course activities.
- 5) **Electronic devices:** Please show respect for your instructor and fellow students by turning off all phones, personal music players, etc., before coming to class. If your phone rings during class **your instructor may answer it for you**. This is no joke, but it will be funny. No devices that allow communication of any kind (cell phones, messaging devices, PDAs, computers, calculators with IR communications capabilities, etc.) may be used during examinations (tests, quizzes, final exams, etc.) in this course. If you strongly prefer to take notes electronically then you must be willing to sit at the front of the class and be prepared to demonstrate acceptable use of your electronic device to your instructor.
- 6) **Course Workload:** You should expect to spend a total of 12 hours per week working to earn your 4 credits in this class. This includes lecture and lab, which account for 5 of those 12 hours. The remainder should be spent reading your textbook, studying your notes, and/or coming to office hours. Reviewing your notes over a cup of coffee for just 30 minutes after each lecture will be tremendously helpful for identifying concepts you do not understand or gaps in your notes. We will cover many topics, most of which will be new and unfamiliar to most of you. I will do my best to make the course content as clear and accessible as possible; you should do your part by reading your textbook and reviewing your notes day to day.

COURSE SCHEDULE:

Wk	Date	Lecture Topic(s)	Lab	Text	Due
1	12 Jan	Introduction; Plate Tectonics	NO LAB	Ch. 1, 2	KS 1
	14 Jan	Plate Tectonics			
2	19 Jan	Plate Tectonics	1. Isostasy	Ch. 2, 13	RQ 1, Lab 1
	21 Jan	Earthquakes			
3	26 Jan	Earthquakes	2. Earthquakes	Ch. 13, 14	RQ 2
	28 Jan	Earthquakes and Earth's Interior			
4	2 Feb	Minerals and the Rock Cycle	(Lab 2 continued)	Ch. 3, 4	RQ 3, Lab 2
	4 Feb	Intrusive Igneous Rocks			
5	9 Feb	NO CLASS (Instructor available for review)	3. Minerals	Ch. 4, 12	KS 2, EXAM 1 , Lab 3
	11 Feb	Igneous Rocks and Volcanoes			
6	16 Feb	Weathering; Sedimentary Rocks	4. Igneous Rocks	Ch. 16, 5	RQ 4, Lab 4
	18 Feb	Sedimentary Rocks & Depositional Environments			
7	23 Feb	Stratigraphy; Geologic Time (Part I)	5. Sedimentary Rocks	Ch. 5, 8, 6, 7	RQ 5; Lab 5
	25 Feb	Metamorphic Rocks; Mountain Building			
8	1 Mar	Geologic Structures	6. Metamorphic Rocks & Geologic Maps	Ch. 7	RQ 6, Lab 6
	3 Mar	Geologic Structures			
9	8 Mar	Hydrologic Cycle; Glaciers	7. Topographic Maps & Glacial Landforms	17, 21	RQ 7, Lab 7
	10 Mar	Glaciers			
10	15 Mar	NO CLASS (Instructor available for review)	8. Streams and Flooding	Ch. 21	KS 3, EXAM 2 , Lab 8, Presentation Draft
	17 Mar	Glaciers			
11	21–25 Mar	NO CLASS (Spring Break)	NO LAB		
12	29 Mar	Rivers	9. Groundwater	Ch. 18	RQ 8, Lab 9
	31 Mar	Rivers			
13	5 Apr	Groundwater	10. Geologic Time	Ch. 17	RQ 9, Lab 10
	7 Apr	Groundwater			
14	12 Apr	Geologic Time (Part II)	11. FIELD TRIP	Ch. 8, 10	RQ 10, Lab 11
	14 Apr	Geologic Time (Part II); Regional Geologic History			
15	19 Apr	Regional Geologic History	Lab Final Exam	Ch. 10	RQ 11, Lab Exam
	21 Apr	Regional Geologic History			
16	26 Apr	Humans and the Earth	Lab Presentations	Ch. 15, 23	RQ 12, Presentation
	28 Apr	Humans and the Earth			
FINAL EXAM: Available at Blackboard Testing Center 29 April – 6 May 2016					

Some other important dates:

- 17 January: Last day to add course without a permission number; Drop fee begins
- 25 January: Last day to drop class without a “W” on your transcript
- 18 March: Last day to withdraw from the course

RQ = Reading Quiz
 KS = Knowledge Survey (optional)

STATEMENT OF TEACHING PHILOSOPHY

SAMUEL D. MATSON

*As an educator, my primary objectives are threefold. First, I seek to convey to my students the value of a lifelong intellectual curiosity about the world around them. I believe that an understanding of science as inquiry-based is fundamental to quality education. **I want my students to understand the fundamental importance of observation and of having questions, and to understand that science is a unique and powerful approach to answering those questions.** I enjoy sharing my passion for discovery with my students by incorporating my own interdisciplinary research interests into my teaching, and my experience as a student and researcher has taught me that interdisciplinary approaches to education are invaluable for creating new worldviews. Second, **I wish to give my students an opportunity to see the world – and their place in it – in an entirely different way.** I have come to see Geoscience as a particularly good vehicle for achieving this goal, since through the study of geology we enjoy a reality that is spatially and temporally beyond our everyday experience. Sharing this alternate worldview with my students is something I enjoy immensely and in turn, I hope to learn from the life experiences each of them brings to the classroom. Finally, **I wish to share with my students the importance of critical thinking and problem-solving as skills that extend beyond a college science course.** A fundamental goal I have for my teaching is to more directly encourage my students to move beyond the stage of analysis and interpretation, and on to action. That is, I want to help my students realize and implement concrete ways that they can apply their newfound knowledge to make positive changes both locally and globally.*

STATEMENT OF SHARED VALUES

Boise State University upholds the following values as the foundation for a civil and nurturing environment. Campus community members are expected to adhere to these common values.

1. Academic Excellence
2. Caring
3. Citizenship
4. Fairness
5. Respect
6. Responsibility
7. Trustworthiness

PLEASE SIGN THE STATEMENT BELOW AND RETURN IT TO YOUR INSTRUCTOR BY THE SECOND WEEK OF CLASS.

I have read, understand, and will comply with the rules described above in this course syllabus.

Your printed name: _____

Your signature and today's date: _____

PLEASE NOTE: You will not receive any further grades in this course until you bring a signed copy of the agreement above to your instructor.