

GEOS 102 – HISTORICAL 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: Tue. 12:00–2:00 pm and by appt.
1162 ERB and/or 205a ACCS

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

Course Text: Stanley and Luczaj, 2015,

Earth System History, 4th edition,

Macmillan, ISBN: 9781429255264

(3rd edition ISBN: 9781429205207)

Course Dates: 12 January – 28 April, 2016

Course Time/Location: TuTh 4:30–5:45 pm, ACCS 209

COURSE DESCRIPTION

This course is an introduction to the history of the Earth and its life over the last 4.6 billion years. The Earth is surprisingly dynamic, especially when considered over timescales that are longer than our everyday experience. Large mountain ranges have been uplifted and been worn away, and ocean basins have formed and disappeared. Entire ecosystems of extraordinary plants and animals have evolved and gone extinct. Ice sheets and shallow seaways have covered Earth's surface and then withdrawn. The story of these changes is written in the rocks that make up the Earth and the fossils of past life forms found in those rocks.

To read this fascinating story, we will first learn some of the basic language, tools, and principles used by geoscientists to understand how the processes we observe happening on Earth today can be used to interpret Earth's history. Key concepts will include plate tectonics, Earth materials and processes, geologic time, Earth systems, and evolutionary theory. In the rest of the course, we will use these basic principles to examine the tectonic, biological, and climatic evolution of the Earth. Key concepts will include the origins of life, the carbon cycle through geologic time, the origin of ecosystems on land, life in the time of the dinosaurs, the evolution of mammals (including humans), and rapid climate change in Earth's history.

LEARNING OUTCOMES

Through the material in this course, students will:

- 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, biological evolution, and the carbon cycle.
- 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.
- reconstruct geologic history based on rock types, structures, fossils, and other geologic evidence.
- explore how climate changes that have occurred in Earth's past provide a context for understanding changes we see happening today

COURSE ORGANIZATION AND GRADING CRITERIA

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

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

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 is determined based on how you perform on the assessments in the course, 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. 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 concepts, 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, 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.

Final Presentation

The class will be divided into groups of 2–3 students, and each group will be responsible for investigating a specific interval of Earth's History and presenting their findings via a 10-minute video presentation at the end of the semester (26-28 April 2016). The lab presentation will comprise 15% of your final course grade. Presentation topics, introductory questions, and assessment criteria will be distributed toward the beginning of the semester.

- 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 9 hours per week working to earn your 3 credits in this class. This includes lecture, which account for 3 of those 9 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.

Wk	Date	Lecture Topic(s)	Text	Due
1	12 Jan	Introduction; Plate Tectonics	Ch. 1, 8	
	14 Jan	Plate Tectonics		
2	19 Jan	Plate Tectonics	Ch. 8, 2	RQ 1
	21 Jan	The Rock Cycle		
3	26 Jan	The Rock Cycle	Ch. 2, 5	RQ 2
	28 Jan	Sedimentary Rocks and Depositional Environments		
4	2 Feb	Sedimentary Rocks; Mountain Building	Ch. 5, 9	RQ 3
	4 Feb	Mountain Building and Structural Geology		
5	9 Feb	EXAM 1	Ch. 6	EXAM 1
	11 Feb	Geologic Time		
6	16 Feb	Geologic Time	Ch. 6, 7	RQ 4
	18 Feb	Evolution and Phylogeny		
7	23 Feb	Why does Earth have the right conditions for life?	Ch. 11, 12	RQ 5
	25 Feb	Snowball Earth: A case study in Earth Systems		
8	1 Mar	The rise of life as we know it. (Well, sort of...)	Ch. 13, 14	RQ 6
	3 Mar	Oceanfront property in Idaho?		
9	8 Mar	What caused the Paleozoic mass extinctions?	Ch. 14, 15	RQ 7
	10 Mar	"Alright – everybody out of the pool!"		
10	15 Mar	EXAM 2	Ch. 15	EXAM 2, Presentation Draft
	17 Mar	Where does the USA's largest energy source come from?		
11	21–25 Mar	NO CLASS (Spring Break)		
12	29 Mar	"Continents: Assemble!"	Ch. 15, 16	RQ 8
	31 Mar	"Now THAT'S a mass extinction!"		
13	5 Apr	Rifting and the Rise of the Rompastompasours	Ch. 16, 17	RQ 9
	7 Apr	Westside Story; Rocky Mountain High		
14	12 Apr	What does an über-greenhouse Earth look like?	Ch. 17, 18	RQ 10
	14 Apr	The rise of the hairy and smelly.		
15	19 Apr	North America: Cool-headed; hot below.	Ch. 18, 19	RQ 11
	21 Apr	Worms escaping Mexico		
16	26 Apr	Rapid climate change: Lessons from the past	Ch. 19, 20	RQ 12 Presentation
	28 Apr	Is Earth's climate changing today?		
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

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 DURING THE FIRST 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.