



Course Syllabus: Historical Geology

McCoy College of Science, Mathematics, and Engineering

Lecture - GEOS 1234 Section 101

Fall 2022

MWF 11 – 11:50 am | Bolin Hall 100

Laboratory Sections

Attend only the section you are registered for:

GEOS 1234 Section 11A: T 1 – 2:50 pm | Bolin Hall 117 | D2L

GEOS 1234 Section 11B: T 3 – 4:50 pm | Bolin Hall 117 | D2L

GEOS 1234 Section 11C: W 1 – 2:50 pm | Bolin Hall 117 | D2L

Contact Information

Instructor: Dr. Steven J. Rosscoe

Office: Bolin Hall 131a

Office hours: MWF 10 – 11 am | T 9 am – 11 am | By Appointment

Office phone: (940) 397-4448

E-mail: steven.rosscoe@msutexas.edu

Course Description

Formation and evolution of the Earth from its origins to the present. Special focus is placed on integrating geological and biological concepts through Earth history, including plate tectonics, mountain building, and major evolutionary events. Additional emphasis is placed on connections to societal issues, including mass extinctions and global climate change.

Course Learning Objectives

The successful completion of this course will be evaluated around the following course learning objectives. Each of these course learning objectives include aspects of both content knowledge and skills development. Students will:

1. Investigate the foundational principles used in unraveling the history of the Earth (plate tectonics, deep time, evolution).
2. Develop an understanding of the major geological and evolutionary events that have occurred throughout geologic time.
3. Apply these understandings to the geology of Texas, Oklahoma, and unique geological environments across the United States.

4. Develop proper laboratory skills and analytical techniques that are foundational to the study of the geological sciences (mineral and rock identification, basic fossil identification environmental interpretation, and correlation).

Textbook & Instructional Materials

Required Textbooks:

Hazen, Robert M. 2013. *The Story of Earth: The First 4.5 Billion Years, From Stardust to Living Planet*. Penguin, 306 p. ISBN 9780143123644

Brannen, Peter. 2017. *The Ends of the World: Volcanic Apocalypses, Lethal Oceans, and Our Quest to Understand Earth's Past Mass Extinctions*. Harper Collins, 322 p. ISBN 9780062364814

Supplemental Lecture and Discussion Readings Provided in D2L as PDFs:

Marshak, Stephen. 2022. Chapter 2: The Way the Earth Works: Plate Tectonics. *In Essentials of Geology, 7th Edition*, pp. 44-79.

Nichols, Tom. 2017. Chapter 2: How Conversation Became Exhausting. *In The Death of Expertise: The Campaign Against Established Knowledge and Why It Matters*, pp. 40-69.

Prothero, Donald R. 2018. Chapter 5: Roots and Chapter 6: Out of Africa. *In When Humans Nearly Vanished: The Catastrophic Explosion of the Toba Volcano*, pp. 95-136

Prothero, Donald R. and Dott, Robert H. 2010. Chapter 3: Evolution. *In Evolution of the Earth, 8th Edition*, pp. 41-67

Wicander, R. and Monroe, James S. 2016. Chapter 4: Geologic Time: Concepts and Principles. *In Historical Geology: Evolution of Earth & Life Through Time, 8th Edition*, pp. 65-83.

Wicander R. and Monroe, James S. 2016. Mesozoic to Cenozoic Time (M-C) – Selections from Chapters 14-17 of *Historical Geology: Evolution of Earth & Life Through Time, 8th Edition*.

Wicander R. and Monroe, James S. 2016. Paleozoic Time – Selections from Chapters 10-13 of *Historical Geology: Evolution of Earth & Life Through Time, 8th Edition*.

Supplemental Laboratory Readings Provided in D2L as PDFs:

Rosscoe, Steven J. 2022. *Earth Materials*. Handouts

Grading

The formal grade for this course is determined by your performance on lecture exams, online discussions, laboratory activities, and laboratory examinations

Table 1: Points allocated to each assignment type. For more details see assignment descriptions below.

Assignments (Quantity)	Points
Lecture Examinations (4/5)	200
Online Discussions (4/5)	100
Lab Activities (10/11)	200
Laboratory Exams (2)	100
Total Points	600

Table 2: Total points for final grade.

Grade	Points
A	540 and up
B	480 to 539
C	420 to 479
D	360 to 419
F	Less than 360

Lecture Examinations (Online)

During the semester there will be five examinations given online through the [D2L](#) course management system (50 points each). These examinations are given at the end of each our major course units (each unit is approximately 3 weeks in length). The examinations will consist of 40 multiple choice questions (1 point each) and two short essay questions (5 points each).

In general, the multiple-choice questions will focus on vocabulary and key concepts while the short essay questions will ask you to provide explanations or describe processes. Short essay questions will require a minimum of five complete and grammatically correct sentences to earn full credit. You will have 90 minutes to complete each examination. Exams will close and auto submit after 90 minutes.

Exams 1 through 4 will be available for a full week, you can take them when you are best prepared. Exam 5 must be taken on the day of your final exam block. During the final exam block I will be available in my office if you have any questions about the course or the final exam.

Table 3: The table below shows the unlock date/time, due date/time, and topic for each exam.

Examination	Unlock Date/Time	Due Date/Time
Exam 1: Time and Geology	Fri 9/9 6:00 pm	Fri 9/16 11:59 pm
Exam 2: Evolving Earth and Life	Fri 9/30 6:00 pm	Fri 10/7 11:59 pm
Exam 3: Precambrian Earth	Fri 10/21 6:00 pm	Fri 10/28 11:59 pm
Exam 4: Paleozoic Earth	Fri 11/11 6:00 pm	Fri 11/18 11:59 pm
Exam 5: Mesozoic-Cenozoic Earth	Mon 12/5 12:01 am	Mon 12/5 11:59 pm

Discussions (Online)

For each unit in the course there will be an assigned discussion reading to get you thinking more in depth about topics we are discussing but may not be able to spend too much time on. After reading the selection for the unit you will need to participate in a group discussion in [D2L](#). For each discussion, there will be a challenge or prompt posed to the group. Each student must answer the challenge or prompt by the first post deadline. You must then participate in the discussion by replying to your peers moving the discussion forward and coming to a group conclusion. You must reply to your peers at least three times. Each discussion is worth 25 points. Each post (1 prompt reply, 3 peer replies) is worth up to 5 points. For full credit the posts must be at least 5 sentences in length (1 point), must use complete and grammatically correct sentences (1 point), must show evidence that you read the material (1 point), and must answer the prompt and move the discussion forward (2 points).

Remember, there are two deadlines per discussion. You must come up with an original prompt reply by the prompt reply deadline, you must post at least three more times by replying to your peers by the final deadline for the discussion. If you miss the first post deadline there will be a 4-point deduction.

Table 4: The table shows the reading name, and discussion post deadlines. Posts that violate the classroom civility policy will be given a grade of zero.

Reading	1st Post Due	Final Deadline
<u>Unit 1</u> : How Conversation Became Exhausting (Nichols PDF)	Mon 8/29 11:59 pm	Fri 9/9 11:59 pm
<u>Unit 2</u> : Chapter 3: Evolution (Prothero & Dott PDF)	Mon 9/19 11:59 pm	Fri 9/30 11:59 pm
<u>Unit 3</u> : Chapter 2: The Big Thwack (Hazen Textbook)	Mon 10/10 11:59 pm	Fri 10/21 11:59 pm
<u>Unit 4</u> : Chapter 1: Beginnings (Brannen Textbook)	Mon 10/31 11:59 pm	Fri 11/11 11:59 pm
<u>Unit 5</u> : Chapter 6: Out of Africa (Prothero PDF)	Mon 11/21 11:59 pm	Fri 12/2 11:59 pm

Lab Activities (In Lab)

The laboratory portion of the course requires the completion of 11 laboratory activities. Most laboratory periods will begin with an introduction of important materials and procedures (usually about a half hour) with a laboratory activity to be completed in the lab. There will typically be questions to be answered after you complete the activity. The lab worksheet is due at the start of the next laboratory period. Labs will be graded and returned the following week. Each lab is worth 20 points, the 10 best lab grades will be the grades used to calculate your course grade (essentially dropping 1 lab). Due dates for each lab can be found on the course due dates table (last page of this document).

Laboratory Exams (In Lab)

There will be a laboratory midterm and final exam. Each exam is worth 50 points.

The laboratory midterm will cover all content in labs 1-7. It will focus on the identification and description of rock and mineral specimens that are key to understanding and interpreting the history of the Earth. The exam will be specimen based. A series of specimens will be supplied with a set of questions that must be answered for each specimen. There will be a period of time where all students rotate through the specimens with a designated amount of time set for each specimen. Following the specimen rotation, you will have the remainder of the laboratory period to go back to any specimens you would like for more time.

The laboratory final examination will cover all content in labs 1-11. It will focus on the development of Earth history data and the interpretation of Earth history from that data. You will be provided an examination packet with rock specimens and evaluate and interpret these to reveal the geologic history you have been provided. You will have the entire laboratory period to complete this examination.

Extra Credit (Online)

The only extra credit opportunities in this course will be given to the entire class, do not ask for individual extra credit. There is one planned extra credit activity (Introduce Yourself Extra Credit (see details in D2L)). Additional extra credit assignments may be assigned as the semester progresses at the discretion of the instructor. Extra credit assignments are assignments that have due dates; no late credit will be given.

Late Work

Most assignments in this course have at least a week of lead time before their due dates. It is your responsibility to complete the assignment before the due date. If you have something that will prevent you from completing the assignment on the day it is due, get it done earlier. No late work will be

accepted. Missed labs and examinations may be made up with a legal, paper-documented, excuse. See below for make-up work policy.

Make-Up Work/Tests

For legal, paper-documented, excuses make-ups for labs and examinations can be completed. Discussions cannot be made up; discussions require interaction with your peers in real time. Make-up work should be arranged for in advance wherever possible. The instructor will give you a new deadline that is reasonable for the course timeline. No make-up work will be allowed beyond 10 days past the original deadline.

Instructor Class Policies

The following policies are the policies that are integral for our successful completion of the course and should be read thoroughly. If you have any questions, please see the instructor.

Academic Honesty

Academic dishonesty is considered cheating, collusion, and plagiarism. Any unauthorized assistance during the completion of assignments, using on aids beyond those authorized for an assignment, or the use of other people or services to complete assignments is considered cheating. Working with others in a way that is not authorized by the instructor to complete assignments is considered to be collusion. Plagiarism is the use of another person's materials (by paraphrase or direct quotation) without giving them full and clear acknowledgement. The use of material prepared by another person or agency selling term papers and academic materials is also considered plagiarism.

If a student is caught cheating, colluding, or plagiarizing on any assignment the assignment grade will automatically be a zero. Two or more violations will result in failure of the course.

Classroom Civility and Inclusion

The best environment for learning is an environment where everyone is respected and valued for who they are. In my classroom, we are striving for full inclusion. Anyone using derogatory language toward an individual or group is in violation of this policy and will be asked to leave. We are all here together, learning together, this is not a place for hate of any kind. Be civil, treat each other with respect, and do your best listen to each other in any conversation.

Electronic Devices

Use of electronic devices for taking notes is allowed in my classroom. Recording (audio or video) is not allowed unless approved by the instructor for educational purposes. The use of social media or streaming anything is not an appropriate use of technology during class. If your use of technology in a non-educational way is being disruptive to your peers, you will be asked to leave.

Course Grade and Grade Bumps

In my courses, a grade is earned by accumulating points throughout the semester. The grade you earn in the course is determined by the number of points you earn through the timely completion of assignments. As such, at the end of the semester, there are no grade bumps given out. Do not ask how or if you can be bumped up to the next letter grade, if you haven't earned the points you will not be able to get that grade.

If you believe there to be an error in the calculation of your grade, whether it is on a specific assignment or the whole course feel free to ask me to re-evaluate and double check. I will do so happily. For specific assignments, be prepared to give me specific reasons you feel the grade is wrong (which wrong answer do you think was right, etc.).

Desire-to-Learn (D2L)

Extensive use of the MSU D2L learning management system is required in this course. Each student is expected to be familiar with this program as it provides a primary source of communication regarding assignments, examination materials, and general course information. You can log into [D2L](#) through the MSU Homepage. If you experience difficulties, please contact the technicians listed for the program or contact your instructor.

Computer Requirements

Taking this course involves the completion of all lecture exams, reading quizzes, and discussions in the course learning management system (D2L). This class requires you to have access to a computer (with Internet access) to complete and upload your assignments. It is your responsibility to have (or have access to) a working computer in this class. **Assignments and tests are due by the due date, and personal computer technical difficulties will not be considered a reason for the instructor to allow students extra time to submit assignments, tests, or discussion postings.** Computers are available on campus in various areas of the buildings as well as the Academic Success Center. **Your computer being down is not an excuse for missing a deadline!!** There are many places to access your class! Our online classes can be accessed from any computer in the world which is connected to the internet. Contact your instructor immediately upon having computer trouble. If you have technical difficulties in the course, there is also a student helpdesk available to you. The college cannot work directly on student computers due to both liability and resource limitations however they are able to help you get connected to our online services. For help, log into [D2L](#).

University Policies and Information

The following information and policies apply to this course. Please read each of these policies and ask your instructor if you have any questions.

Important Dates

Last day for term schedule changes: August 25, 2022

Deadline to file for December graduation: September 26, 2022

Deadline to file for May graduation: October 3, 2022

Last Day to drop with a grade of "W:" October 24, 2022

Attendance

Students are expected to attend all meetings of the classes in which they are enrolled. Although in general students are graded on intellectual effort and performance rather than attendance, absences may lower the student's grade where class attendance and class participation are deemed essential by the faculty member. In those classes where attendance is considered as part of the grade, the instructor should so inform students of the specifics in writing at the beginning of the semester in a syllabus or separate attendance policy statement. An instructor who has an attendance policy must keep records on a daily basis. The instructor must give the student a verbal or written warning prior to being dropped from the class. Instructor's records will stand as evidence of absences. A student with excessive absences may be dropped from a course by the instructor. Any individual faculty member or college has the authority to establish an attendance policy, providing the policy is in accordance with the General University Policies.

Change of Schedule

A student dropping a course (but not withdrawing from the University) within the first 12 class days of a regular semester or the first four class days of a summer semester is eligible for a 100% refund of applicable tuition and fees. Dates are published in the Schedule of Classes each semester.

Refund and Repayment Policy

A student who withdraws or is administratively withdrawn from Midwestern State University (MSU) may be eligible to receive a refund for all or a portion of the tuition, fees and room/board charges that were paid to MSU for the semester. HOWEVER, if the student received financial aid (federal/state/institutional grants, loans and/or scholarships), all or a portion of the refund may be returned to the financial aid programs. As described below, two formulas (federal and state) exists in determining the amount of the refund. (Examples of each refund calculation will be made available upon request).

Services for Students with Disabilities

In accordance with Section 504 of the Federal Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990, Midwestern State University endeavors to make reasonable accommodations to ensure equal opportunity for qualified persons with disabilities to participate in all educational, social, and recreational programs and activities. After notification of acceptance, students requiring accommodations should make application for such assistance through Disability Support Services, located in the Clark Student Center, Room 168, (940) 397-

4140. Current documentation of a disability will be required in order to provide appropriate services, and each request will be individually reviewed. For more details, please go to [Disability Support Services](#).

Campus Carry Rules/Policies

Effective August 1, 2016, the Campus Carry law (Senate Bill 11) allows those licensed individuals to carry a concealed handgun in buildings on public university campuses, except in locations the University establishes as prohibited. The new Constitutional Carry law does not change this process. Concealed carry still requires a License to Carry permit, and openly carrying handguns is not allowed on college campuses. For more information, visit [Campus Carry Rules and Policies](#)

Active Shooter

The safety and security of our campus is the responsibility of everyone in our community. Each of us has an obligation to be prepared to appropriately respond to threats to our campus, such as an active aggressor. Please review the information provided by MSU Police Department regarding the options and strategies we can all use to stay safe during difficult situations. For more information, visit [Safety / Emergency Procedures](#).

Smoking/Tobacco Policy

College policy strictly prohibits the use of tobacco products in any building owned or operated by MSU. Adult students may smoke only in the outside designated-smoking areas at each location.

Alcohol and Drug Policy

To comply with the Drug Free Schools and Communities Act of 1989 and subsequent amendments, students and employees of Midwestern State are informed that strictly enforced policies are in place which prohibits the unlawful possession, use or distribution of any illicit drugs, including alcohol, on university property or as part of any university-sponsored activity. Students and employees are also subject to all applicable legal sanctions under local, state and federal law for any offenses involving illicit drugs on University property or at University-sponsored activities.

Grade Appeal Process

Following the appropriate procedure for grade appeals requires you to speak to your instructor first, so talk to your instructor. Students who wish to appeal a grade should consult the Midwestern State University [Undergraduate Catalog](#).

Course Schedule

Notice: Changes in the course syllabus, procedure, assignments, and schedule may be made at the discretion of the instructor. All lab activities are due by the start of your lab session the week following the in-class activity. All lab exams are due at the end of the lab period of the exam.

Week	Monday	Wednesday	Friday
<u>Week 1</u> 8/22 to 8/26	Introduction <i>No Reading</i>	Science <i>No Reading</i>	Historical Geology <i>No Reading</i>
	Lab Introduction Lab Safety <i>No Reading</i>		
<u>Week 2</u> 8/29 to 9/2	Deep Time <i>WM Ch. 4 (PDF)</i>	Relative Age <i>WM Ch. 4 (PDF)</i>	Relative Age <i>WM Ch. 4 (PDF)</i>
	Lab 01 – Rock Forming Minerals <i>Rosscoe Ch. 1, 2 (PDF)</i>		
<u>Week 3</u> 9/5 to 9/9	No Class Labor Day	Absolute Age <i>WM Ch. 4 (PDF)</i>	Geologic Time Scale <i>WM Ch. 4 (PDF)</i>
	Lab 02 – Igneous Rocks <i>Rosscoe Ch. 3 (PDF)</i>		
<u>Week 4</u> 9/12 to 9/16	Continental Drift <i>M Ch. 2 (PDF)</i>	Seafloor Spreading <i>M Ch. 2 (PDF)</i>	Plate Tectonics <i>M Ch. 2 (PDF)</i>
	Lab 03 – Clastic Sedimentary Rocks <i>Rosscoe Ch. 4, 5 (PDF)</i>		
<u>Week 5</u> 9/19 to 9/23	Plate Boundaries <i>M Ch. 2 (PDF)</i>	Plate Boundaries <i>M Ch. 2 (PDF)</i>	Hot Spots <i>M Ch. 2 (PDF)</i>
	Lab 04 – Other Sedimentary Rocks <i>Rosscoe Ch. 4, 5 (PDF)</i>		
<u>Week 6</u> 9/26 to 9/30	Selection <i>PD Ch. 3 (PDF)</i>	Speciation <i>PD Ch. 3 (PDF)</i>	Evolution <i>PD Ch. 3 (PDF)</i>
	Lab 05 – Major Invertebrate Fossil Groups <i>Rosscoe Ch. 6 (PDF)</i>		
<u>Week 7</u> 10/3 to 10/7	The Big Bang <i>Hazen Ch. 1</i>	Birth of Earth <i>Hazen Ch. 1</i>	A New Moon <i>Hazen Ch. 2</i>
	Lab 06 – Other Fossil Groups <i>No Reading</i>		
<u>Week 8</u> 10/10 to 10/14	Crustal Development <i>Hazen Ch. 3, 5</i>	Water & Atmosphere <i>Hazen Ch. 4</i>	Origin of Life <i>Hazen Ch. 6</i>
	Lab 07 – Metamorphic Rocks <i>Rosscoe Ch. 7 (PDF)</i>		
<u>Week 9</u> 10/17 to 10/21	Oxidation <i>Hazen Ch. 7</i>	Supercontinents <i>Hazen Ch. 8, 9</i>	A Complicating Life <i>Hazen Ch. 10</i>
	Laboratory Midterm – Minerals, Rocks, and Fossils		

Course Schedule Continued

Notice: Changes in the course syllabus, procedure, assignments, and schedule may be made at the discretion of the instructor. All lab activities are due by the start of your lab session the week following the in-class activity. All lab exams are due at the end of the lab period of the exam.

Week	Monday	Wednesday	Friday
Week 10 10/24 to 10/28	Cratonic Flooding <i>WM Paleozoic (PDF)</i>	Mobile Belts <i>WM Paleozoic (PDF)</i>	Paleozoic CFSs <i>WM Paleozoic (PDF)</i>
	<u>Lab 08</u> – Stratigraphic Sections <i>No Reading</i>		
Week 11 10/31 to 11/4	Appalachians <i>WM Paleozoic (PDF)</i>	Pangaea <i>Hazen Ch. 4, 5, 6</i>	Pangaea's Children <i>WM Paleozoic (PDF)</i>
	<u>Lab 09</u> – Correlation <i>No Reading</i>		
Week 12 11/7 to 11/11	Diversifying Life <i>Brannen Ch. 1</i> <i>Hazen Ch. 10</i>	Mass Extinctions <i>Brannen Ch. 2, 3</i>	The Great Dying <i>Brannen Ch. 4</i>
	<u>Lab 10</u> – Environmental Interpretation I <i>No Reading</i>		
Week 13 11/14 to 11/18	Ceno-Meso CFSs <i>WM M-C (PDF)</i>	The Rockies <i>WM M-C (PDF)</i>	The Grand Canyon <i>WM M-C (PDF)</i>
	<u>Lab 11</u> – Environmental Interpretation II <i>No Reading</i>		
Week 14 11/21 to 11/25	N.A. Volcanoes <i>WM M-C (PDF)</i>	No Class <i>Thanksgiving</i>	No Class <i>Thanksgiving</i>
	No Lab <i>Thanksgiving</i>		
Week 15 11/28 to 12/2	Diversification <i>Hazen Ch. 10</i> <i>P Ch. 5, 6 (PDF)</i>	Extinction <i>Brannen Ch. 5, 6, 7</i>	The Future <i>Hazen Ch. 11</i> <i>Brannen Ch. 8, 9</i>
	Lab Final – Reading Earth History		
Finals 12/5	Final Exam Block: Mon. Dec. 5, 10:30 am – 12:30 pm		

Course Due Dates in Chronological Order

The following table lists the due dates of each assignment in the course. Lab due dates correspond to the day of your lab (ex: if you have a Tuesday lab, use the Tuesday due date).

Due Date	Assignment
M 08/29	Discussion 1: Prompt Reply
T 09/06 W 09/07	Lab 1: Rock Forming Minerals
F 09/09	Discussion 1: Complete Discussion
T 09/13 W 09/14	Lab 2: Igneous Rocks
F 09/16	Examination 1: Time and Geology
M 09/19	Discussion 2: Prompt Reply
T 09/20 W 09/21	Lab 3: Clastic Sedimentary Rocks
T 09/27 W 09/28	Lab 4: Other Sedimentary Rocks
F 09/30	Discussion 2: Complete Discussion
T 10/04 W 10/05	Lab 5: Major Invertebrate Fossil Groups
F 10/07	Examination 2: Evolving Earth and Life
M 10/10	Discussion 3: Prompt Reply
T 10/11 W 10/12	Lab 6: Other Fossil Groups
T 10/18 W 10/19	Lab 7: Metamorphic Rocks
T 10/18 W 10/19	Laboratory Midterm Examination
F 10/21	Discussion 3: Complete Discussion
F 10/28	Examination 3: Precambrian Earth
M 10/31	Discussion 4: Prompt Reply
T 11/01 W 11/02	Lab 8: Stratigraphic Sections
T 11/08 W 11/09	Lab 9: Correlation
F 11/11	Discussion 4: Complete Discussion
T 11/15 W 11/16	Lab 10: Environmental Interpretation I
F 11/18	Examination 4: Paleozoic Earth
M 11/21	Discussion 5: Prompt Reply
T 11/29 W 11/30	Lab 11: Environmental Interpretation II
T 11/29 W 11/30	Laboratory Final Examination
F 12/02	Discussion 5: Complete Discussion
M 12/05	Examination 5: Mesozoic-Cenozoic Earth