Course Syllabus: Historical Geology - Online

McCoy College of Science, Mathematics, and Engineering

Lecture/Lab - GEOS 1234 Section X10

FALL 2025

Course D2L Site

Contact Information

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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

Podcast Project Reading:

You are required to select one of the following books to read and review for you course podcast project. These books are available in traditional formats and also available as audiobooks on Audible.

- Benton, Michael J. 2015. When Life Nearly Died: The Greatest Mass Extinction of All Time. Thames & Hudson, 352 p. ISBN 9780500291931
- Egan, Timothy. 2006. The Worst Hard Time: The Untold Story of Those Who Survived the Great American Dust Bowl. Mariner Books Classics, 353 p. ISBN 9780618773473
- Prothro, D. R. 2018. When Humans Nearly Vanished: The Catastrophic Explosion of the Toba Volcano. Smithsonian Books, 208 p. ISBN 9781588346353
- Shubin, Neil. 2009. Your Inner Fish: A Journey into the 3.5-Billion-Year History of the Human Body. Vintage, 256 p. 9780307277459
- Weiner, Jonathan. 1995. The Beak of the Finch: A Story of Evolution in Our Time. Vintage, 332 p. ISBN 9780679733379

Required Computer Applications:

- Microsoft Office: Word, PowerPoint Free Access to Microsoft Office 365
    - Required for completion of laboratory activities.
- Minecraft Bedrock Edition Microsoft Store for Minecraft
    - Required for completion of laboratory activities in the final laboratory module.
    - Regular price access is $29.99 (then you have it for life).
    - Must be compatible with Minecraft Realms to work for the lab.
        - Do not use the JAVA edition.
        - Mobile and Console appear to work well.
- PDF Reader
    - PDFs are used to provide some course materials; a browser PDF reader or Adobe Acrobat will be necessary to view them.

Recommended Textbooks (Not Required):

- Wicander, R. and Monroe, James S. 2016. Historical Geology: Evolution of Earth & Life Through Time, 8th Edition. Cengage Learning. 448 p.

Supplemental Laboratory Readings Provided in D2L as PDFs:

- Rosscoe, Steven J. 2024. Earth Materials.
- Others as Necessary

Grading

The formal grade for this course is determined by your performance on lecture exams, podcast project, laboratory activities, and laboratory quizzes.

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

Assignments (Quantity)	**Points**
Lecture Examinations (4/5)	200
Podcast Project (1)	100
Lab Activities (12/13)	240
Laboratory Quizzes (3)	060
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 to be taken at the end of each module, after you have watched and taken notes on all video lectures and read the required readings. Examinations will be available for you to take as early as the opening date of the module. You may take the examination at any point during the three-week-long module, but must complete it by the module due date. The examinations will consist of 50 multiple choice questions (1 point each). The multiple-choice questions will focus on vocabulary and key concepts and Earth processes. You will have 60 minutes to complete each examination. Exams will close and auto submit after 60 minutes.

- Examinations are individual exercises.
- You may not take examinations with each other.
- You may not use internet resources while taking the examination.
- You may use your course textbooks and your lecture notes from class.
- You are responsible for studying and learning the material before taking the examination (~1 minute per question is standard and more than enough time if you have properly studied for the examination).
    - You will not have enough time to look up every question if you do not study in advance for the examination. Study is key.

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

Examination	**Due Date/Time**
Exam 1: Time and Geology	Fri 09/12 (11:59 pm)
Exam 2: Evolving Earth and Life	Fri 10/03 (11:59 pm)
Exam 3: Precambrian Earth	Fri 10/24 (11:59 pm)
Exam 4: Paleozoic Earth	Fri 11/14 (11:59 pm)
Exam 5: Mesozoic-Cenozoic Earth	Fri 12/05 (11:59 pm)

Podcast Project (Online/Group)

One of the driving themes in a Historical Geology course is that of change. The Earth and the life upon it are constantly changing. These changes are often complicated and inter-related between life and the Earth. As such, the dynamic changes of our planet are key to understand. In a course, the lecture material must only graze and highlight some of the important changes in Earth history. But you should also take time to learn about one of these changes in a detailed way.

- Group selects podcast topic [5 points total] – a list of available topics is available in D2L under the Podcast Project module (the books for those topics can be found under the Podcast Project Readings heading, earlier in this syllabus). Discuss with your group and select the topic your group would like to complete. Send Dr. Carter an e-mail with your group's selection by the topic selection due date. Each topic is limited to two groups. Topics are assigned on a first-come basis. When a topic is selected and approved, the group members names will be placed next to it in D2L. [5 points]

- Group meeting with professor [15 points total] – Between October 20 and October 23 the group (all members) must schedule and participate in a Zoom meeting with Dr. Carter.
    - The group must show that they have been working by explaining how they have worked so far [5 points as a group].
    - The group must have prepared an outline for their podcast that shows how the time will be divided, the role of each group member in the podcast, and some level of detail about the information being presented for specific components [5 points as a group].
    - The group demonstrates that everyone is participating, has knowledge of the topic, and everyone attends and participates in the scheduled meeting [5 points for individuals].

- Group submits a completed podcast audio file [80 points total] – At the due date each group will submit their final podcast audio file. The following describes the required components and grade distribution.
    - The audio file is the appropriate format (audio only: .mp3, .m4a, .wma OR video: .mp4, .wmv) [2.5 points as a group].
    - The audio file is submitted on time [2.5 points as a group].
    - All group members introduce themselves by name and major [2 points for individuals]
    - Component 1: Introduction – The host/co-hosts of the podcast introduce the book and the topic. In this segment a brief summary (highlights) of the book should be

discussed. The two content heavy components (2 & 3) should be introduced to show how the podcast will move forward [10 points as a group].
    - Component 2: Deep-Dive Subtopic A – The host/co-hosts interact with "experts" sharing detailed information on one major aspect of the topic presented in the book. This section should include not only a summary of the information on the topic, but details on the topic and a discussion of the importance of this topic [20 points as a group].
    - Component 3: Deep-Dive Subtopic B – The host/co-hosts interact with "experts" sharing detailed information on another major aspect of the topic presented in the book. This section should include not only a summary of the information on the topic, but details on the topic and a discussion of the importance of this topic [20 points as a group].
    - Component 4: The host/co-hosts review the book, give it a rating (ex: 4/5), discuss the entertainment quality of the book, the scientific quality of the book, the overall value of the book to the understanding of science and historical geology. The other group members should participate here as well (either as experts or as themselves) [10 points as a group].
    - Individual Participation: All group members participate in at least one component of the podcast [5 points for individuals].
    - Overall Audio Quality: the podcast is recorded in a manner that all speakers are easily understandable with little background noise and distraction (room tone is good actually, just not overwhelming) [3 points as a group].
    - Performance Quality: each speaker is practiced and understandable and does not sound as if reading from a script [3 points for individuals].
    - Podcast Length: must be five minutes in length (extra credit commercial doesn't count toward time). [2 points as a group]
    - Extra Credit Commercial: each group has the option to make a fun commercial related to the topic being discussed. The commercial should be 20 to 30 seconds in length. [+3 points as a group]

- Table 4: The table shows checkpoints and deadlines for the group podcast project for the semester.

Checkpoint/Deadline	**Due Date**	**Format**
Group Selects Podcast Topic	Fri 09/26	E-mail
Group Meets with Professor	Thurs 10/30	Zoom Meeting
Podcast Submitted	Fri 12/05	File Upload

<u>Lab Activities (In Lab)</u>

The historical geology course requires the completion of 13 laboratory activities. If you do not complete the lab activities, the statistical odds are that you will fail the course. Each lab is worth 20 points. The 12 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).

For most of the laboratory activities you will have:

- A prelab reading (read before doing the activity).
- A video introduction to the laboratory material (view before doing the activity).
- Microsoft Office documents (Word, PowerPoint, Excel) to complete during the activity.
- Activity materials (Video, PowerPoints, Documents).

Each lab must be completed by its due date as listed on the last page of the syllabus. This allows the instructor to grade and you to see how you are doing before taking the lab module quiz (see lab quizzes below).

Labs are submitted through a quiz on D2L. The quizzes will include multiple choice, written response, and upload questions as needed. These quizzes are not timed but are due by 11:59 pm on their scheduled due date.

Laboratory Quizzes (Online)

To test your laboratory skills and ability to use the techniques taught throughout the lab you will be given three laboratory quizzes. The first quiz covers the Earth Materials laboratories (Labs 1 to 5). The second quiz covers the Life on the Rocks laboratories (Labs 6 to 8). The third and final quiz covers the Visualizing Earth and Earth History laboratories (Labs 9 to 13). You will need to study throughout the semester to prepare for these laboratory examinations.

The quizzes are provided through D2L and may include a mix of multiple choice, written response, and file uploads. Each quiz is worth 20 points. The quizzes will be timed in a manner that allows appropriate time to complete the quiz questions but prevent looking up each answer, you will have one attempt to complete the quiz. The time limit for the quiz will be clearly indicated in the quiz description in D2L. You must study and prepare for these quizzes. Lab quizzes are due by 11:59 pm on the dates indicated on the last page of this syllabus.

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

This is an online course where each assignment has a week or more of lead time before their due date. ***No late work will be accepted**. Missed labs and examinations may be made up with a legal, paper-documented, excuse.

Make-Up Work/Tests

For legal, paper-documented excuses make-ups for labs and examinations can be completed. 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 (lecture or lab) will be allowed beyond 10 days past the original deadline**.

The group project cannot be made-up as it requires active participation in the group throughout the semester. While your group should work with your schedule to include you and reschedule meetings due to illness, if you do not participate at all you will not be able to make-up the assignment.

Note: You must complete the assignments, laboratories, and examinations presented in this syllabus. No substitute assignments will be allowed to compensate for poor performance or missed deadlines.

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.

The use of any artificial intelligence (AI) in completing course assignments is NOT allowed. AI in this sense is any technology that summarizes, writes, or answers questions on its own. College is about you learning to write, you developing your voice, and you learning how to process, summarize, and properly cite information. Any use of AI is considered a violation of this academic honesty policy.

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.

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.

Inclement Weather Policy
Because this is an online course, campus delays and closures due to inclement or extreme weather WILL NOT impact the course. All due dates will remain in place.

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 (Check dates on Academic Calendar)
Fall 2025 Classes Begin: August 25, 2025
Last day for term schedule changes: August 26, 2025
Last day to drop with a grade of W for Fall 2025: November 24, 2025
Refer to: Withdrawals and Drops

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. Two formulas, federal and state, exist 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.

Lecture Modules and Due Dates

The following is a table of all lecture module activities required for the successful completion of this course in Historical Geology. All activities below are due by 11:59 pm on the date indicated.

***NOTICE:** Changes in the course syllabus, procedures, assignments, and schedule may be made at the discretion of the instructor.

Lecture Module	Lecture Activity	Due Date
1. Time and Geology	Lecture 1.0 – Course Introduction Lecture 1.1 – The Nature of Science Lecture 1.2 – Historical Geology Lecture 1.3 – Deep Time Lecture 1.4 – Principles of Stratigraphy Lecture 1.5 – Relative Age Dating Lecture 1.6 – Foundations of Absolute Age Lecture 1.7 – Absolute Age Dating Examination 1 – Time and Geology	Fri 09/12/2025

Lecture Module	Lecture Activity	Due Date
2. Evolving Earth and Life	Lecture 2.0 – Continental Drift Lecture 2.1 – Seafloor Spreading Lecture 2.2 – Plate Tectonics Lecture 2.3 – Plate Boundaries Lecture 2.4 – Hot Spots Lecture 2.5 – Selection Processes Lecture 2.6 – Variation and Speciation Lecture 2.7 – Concepts in Evolution Examination 2 – Evolving Earth and Life	Fri 10/03/2025
3. Precambrian Earth	Lecture 3.0 – Origins of Everything Lecture 3.1 – Birth of the Earth Lecture 3.2 – A New Moon Lecture 3.3 – Building the Crust Lecture 3.4 – Earth's Water and Atmosphere Lecture 3.5 – Inorganic Origins of Life Lecture 3.6 – Oxygenation and Oxidation Lecture 3.7 – Supercontinents and Glaciations Lecture 3.8 – A Complicating Life Examination 3 – Precambrian Earth	Fri 10/24/2025
4. Paleozoic Earth	Lecture 4.0 – Introduction to the Paleozoic Lecture 4.1 – Mobile Belts and Orogenic Events Lecture 4.2 – Cratonic Flooding Sequences Lecture 4.3 – The Appalachian Orogeny Lecture 4.4 – Assembling Pangaea Lecture 4.5 – Of Pangaean Origin Lecture 4.6 – Paleozoic Invertebrates Lecture 4.7 – Paleozoic Plants and Vertebrates Lecture 4.8 – Paleozoic Mass Extinctions Examination 4 – Paleozoic Earth	Fri 11/14/2025
5. Mesozoic-Cenozoic Earth	Lecture 5.0 – Becoming Modern Earth Lecture 5.1 – The Cordilleran Orogeny Lecture 5.2 – The Evolving Continent I Lecture 5.3 – The Evolving Continent II Lecture 5.4 – Mesozoic Life and Death Lecture 5.5 – Cenozoic Life and Death Lecture 5.6 – On the Horizon and Beyond Examination 5 – Mesozoic-Cenozoic Earth	Fri 12/05/2025

Laboratory Activities and Due Dates

The following is a table of all laboratory activities required for the successful completion of this course in Historical Geology. All laboratory activities below are due by 11:59 pm on the date indicated.

***NOTICE:** Changes in the course syllabus, procedures, assignments, and schedule may be made at the discretion of the instructor.

Lab Activities	Due Dates
Lab 01 – The Rock Forming Minerals	Fri 09/05/2025
Lab 02 – Igneous Rocks	Fri 09/12/2025
Lab 03 – Clastic Sedimentary Rocks	Fri 09/19/2025

Lab Activities	Due Dates
Lab 04 – Other Sedimentary Rocks	Fri 09/26/2025
Lab 05 – Metamorphic Rocks	Fri 10/03/2025
Lab Quiz 1 – Earth Materials	Fri 10/03/2025
Lab 06 – Single-Celled and Colonial Life	Fri 10/10/2025
Lab 07 – Common Invertebrates	Fri 10/17/2025
Lab 08 – Other Fossil Life	Fri 10/24/2025
Lab Quiz 2 – Life on the Rocks	Fri 10/24/2025
Lab 09 – Topographic Maps	Fri 10/31/2025
Lab 10 – Geologic Maps	Fri 11/07/2025
Lab 11 – Measured Sections	Fri 11/14/2025
Lab 12 – Correlation	Fri 11/21/2025
Lab 13 – Geologic Histories	Fri 12/05/2025
Lab Quiz 3 – Visualizing Earth and Earth History	Fri 12/05/2025

All Course Due Dates in Chronological Order

The following table lists the due dates of each assignment in the course. All items are due at 11:59 pm on the date for which they are due.

***NOTICE:** Changes in the course syllabus, procedures, assignments, and schedule may be made at the discretion of the instructor.

Due Date	Assignment
Fri 09/05/2025	Lab 01 – The Rock Forming Minerals
Fri 09/12/2025	Examination 1 – Time and Geology Lab 02 – Igneous Rocks Introduce Yourself Extra Credit
Fri 09/19/2025	Lab 03 – Clastic Sedimentary Rocks
Fri 09/26/2025	Lab 04 – Other Sedimentary Rocks Podcast Project Topic Selection
Fri 10/03/2025	Examination 2 – Evolving Earth and Life Lab 05 – Metamorphic Rocks Lab Quiz 1 – Earth Materials
Fri 10/10/2025	Lab 06 – Single-Celled and Colonial Life
Fri 10/17/2025	Lab 07 – Common Invertebrates
Fri 10/24/2025	Examination 3 – Precambrian Earth Lab 08 – Other Fossil Life Lab Quiz 2 – Life on the Rocks
Thurs 10/30/2025	Podcast Project Group Meeting with Instructor
Fri 10/31/2025	Lab 09 – Topographic Maps
Fri 11/07/2025	Lab 10 – Geologic Maps
Fri 11/14/2025	Examination 4 – Paleozoic Earth Lab 11 – Measured Sections
Fri 11/21/2025	Lab 12- Correlation
Fri 12/05/2025	Examination 5 – Mesozoic-Cenozoic Earth Lab 13 – Geologic Histories Lab Quiz 3 – Visualizing Earth and Earth History Podcast Project Upload