



**Course Syllabus: Physical Geology**  
**McCoy College of Science, Mathematics, and Engineering**  
**GEOS 1134-102**  
**Spring 2021**

**Contact Information**

Instructor: Dr. Andrew Katumwehe

Office: Bolin 307H

Lecture: MWF 11:00-11:50 AM RM B100

Lab GEOS1134-21A: M 1:00-2:50 PM RM 117

Lab GEOS1134-21B: T 1:00-2:50 PM RM 115

Lab GEOS1134-21D: Th 3:00-4:50 PM RM 115

Office hours: M - F: 9:00 – 10:00 AM and by appointment

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**Course Description**

This course is a lecture-based overview of the Earth, its mineral and rock components, and the variety of physical processes, both surface and subsurface that have operated over the long history of Earth. Lectures, are of limited length and cover only the most essential aspects of the 24 topics that comprise this course, however this gives you the basic knowledge if they are complimented with more reading. These topics cover various components of the earth including minerals, igneous rocks, sedimentary rocks, and metamorphic rocks and their associated mineral and energy deposits. We will also look at the various subsurface processes such as weathering, erosion, mass movement due to water, wind, and gravity that largely shape the Earth's surface. We will examine the subsurface processes that affect us such as earthquakes and volcanic activity and their associated hazards. We will look at the theory of plate tectonics that was put forward as a hypothesis in the early 1900's that became widely accepted about 50 years ago. In addition to the PowerPoint-based lectures, you are also expected to read the appropriate chapters in the mandatory course textbook. This course syllabus contains a detailed schedule including a list of specific topics and corresponding textbook readings.

The Lab portion of the course includes hands-on projects ranging from mineral and rock identification to using and understanding maps to studying key surface processes such as mass wasting (landslides and rock falls), impact of water as an agent of weathering and transport medium, and the impact of more dramatic geological processes such as earthquakes and volcanoes. Please you will need the required Lab Manual in your lab section meetings.

At the end of this course, you will be familiar with the structure of earth, surface and subsurface, the importance of plate tectonics as a unifying theme for geology and as an explanation for the occurrence and distribution of oceans, mountains, earthquakes, volcanoes, and large geologically passive regions such as the eastern portion of the United States. You will also understand the role of rivers, winds, oceans, and gravity that continuously shape the Earth's surface.

### **Required Textbook & Instructional Materials**

Earth: An Introduction to Physical Geology (Tarbuck, 12th Edition)

Laboratory Manual in Physical Geology (Cronin and Tasa, 11th Edition)

### **Student Handbook**

Refer to: [Student Handbook 2017-18](#)

### **Academic Misconduct Policy & Procedures**

**Academic Dishonesty:** MSU is committed to maintaining the highest standards of integrity and ethical conduct. This level of ethical behavior and integrity will be maintained in this course. Participating in a behavior that violates academic integrity (e.g., unauthorized collaboration, plagiarism, multiple submissions, cheating on examinations, helping another person cheat, unauthorized advance access to examinations, altering or destroying the work of others, and altering academic records) will result in an official academic sanction. Violations may subject you to disciplinary action including the following: receiving a failing grade on an assignment, examination or course, receiving a notation of a violation of academic integrity on your transcript, and being suspended from the University. You have the right to appeal the charge. Additional guidelines on procedures in these matters may be found in the Office of Student Conduct.

<https://msutexas.edu/student-life/assets/files/handbook.pdf>.

### **Grading**

Lecture Portion of course = 55% of final grade. Exam 1 = 10% of final grade; Lecture Exam 2 = 15% of final grade; Final Exam = 20% of final grade; lecture quizzes 10%. Lab Portion of course = 40% of final grade. Lab Quizzes 1 and 2 (Rock and Mineral Identification) each determine 5% of your final course grade. The Lab Comprehensive Final Quiz is worth 10% of final course grade (and yes, there will be rocks and minerals to identify on the lab final!). Lab attendance and participation, lab exercise completion, and homework assignments (usually one per week) determine your overall Lab completion grade which is worth 20% of your final course grade. All lab assignments must be turned in within one week of original due date. Late submissions will receive a grade penalty of generally one letter grade per week. After two weeks, a grade of zero will be given for a late assignment. Exams and Lab Quizzes may be made up only if (1) you have a written excuse as to why you missed the exam and (2) you notified Dr. Katumwehe and lab TA in advance that you would miss the exam. A missed exam or quiz must be made up within one week or you receive a grade of zero. However, there may be

extreme circumstances as to why prior notice was not given. These will be evaluated on a case-by-case basis. Note that oversleeping is not an acceptable reason! Only the final lab exam will be cumulative and will include material from previous lab assignments and exercises. The Research Paper grade is 5% of final grade. Research papers must be between 2250 and 3250 words (about 4-6 pages of text based on 11-pt or 12-pt font; word count per MSWord's word count tool) and be no longer than ten total pages including illustrations and title page. Papers must contain a summary of no more than 250 words (included in word count), at least three primary, peer reviewed references, and be structured as follows: (1) Title page with title and author; (2) Abstract; (3) Introduction (background and rationale for paper topic choice); (4) Discussion (basically what you learned and want to share with your colleagues as a result of your research); (5) Conclusion (highlight or restatement of most important learning's from your perspective and why you chose the particular topic); and (6) references (minimum of five primary references. Wikipedia is not considered and please use scientific references both Figures and/or tables (with captions and references) may be included within the text or at end of paper. Format – MS Word; paper copy and electronic copy must be submitted per the course schedule/syllabus. Papers submitted one week late will be docked 10 points; thus a paper that would have received an 85% grade if submitted on time will receive a final grade of 75% if submitted one week late. Research papers submitted more than two weeks late will be given a grade of zero. Papers must be submitted in both printed and electronic form (MS Word). The word document is needed for the total word count. This should be submitted to [andrew.katumwehe@msutexas.edu](mailto:andrew.katumwehe@msutexas.edu) with the words "GEOS Paper Spring2021" along with your paper title on the email subject line. The research paper grade is determined based on format compliance (up to 60% of paper grade; see above) and logical reasoning (up to 40% of paper grade). The Lecture exams, lab quizzes, and lab completion grades are curved" by a simple arithmetic adjustment so that the class grade average is between 76-80%. Note that this only applies to students whose lab and class attendance is unquestionable and have submitted their quizzes, exams lab assignments and research paper. All components of your final grade must be completed by April 04 2021. The homework assignments will be posted on D2L. Homework due dates are listed in the syllabus. No homework, lab assignments, or research papers may be submitted after 04/22/2021. The Table below (next page) summarizes the grading policy for this course.

**Table 1: Grade points as discussed in the grading section above.**

<b>Graded Items</b>	<b>Contribution to Final Course Grade</b>
Exam 1	10%
Exam 2	10%
Final Exam 3	25%
Lecture Quizzes	10%
Lab Overall Grade (includes lab quizzes, lab participation and attendance, homework assignments and assessments)	40% (Labs for mineral and rock <b>each</b> quiz is 5% of final course grade Lab final is 10% of final course grade). The lab participation grade (20% of final course grade) is derived from lab assignments, lab participation and attendance, and homework submittals.
Research Paper	5%

**Table 2:** Final grades are normally rounded up to the nearest integer before assigning the final course letter grade. For example, a final calculated course grade of 89.8% will be rounded up to a final course grade of 90%.

Grade	Points
A	90 and above
B	80-89
C	70-79
D	60-69
F	Less than 60

### **Homework**

See Grading Section for details – All Homework will be submitted to your lab TA in your regular lab section

### **Lab Assignments**

See Grading Section for details – All Lab Assignments must be submitted to your lab TA during your regular lab section meeting.

### **Lab Attendance Policy – Important!**

Students who **miss three** or more lab section meetings may be dropped from the course by the instructor. Students are responsible to work with their lab section TA to make up any missed material in a timely fashion. Students must notify their lab TA and Dr. Katumwehe by email in advance of missing a lab section. Students **who leave lab sections and class early may be marked absent.** However, any proximal interaction, including supervision or collegial interaction in the class, lab and outside during demonstration requires a cloth face covering.

The SARS-Cov2 virus is a threat to the execution of this class. We will replicate conditions that have been useful to healthcare workers.

Rules:

- Stay home if you or anyone in your immediate dwelling is ill.
- You must pass a daily self-assessment whenever you engage in non-remote work – reporting the absence of fever or other symptoms.
- Wash hands for 20 seconds whenever possible. Use hand sanitizer at least once per hour.
- Maintain 6 feet distance when possible.
- Masks are to be worn whenever in close proximity or in closed spaces. An extra face shield will be provided if needed in the lab
- Individuals should be each assigned equipment, when possible.
- Wipe equipment disinfecting cleanser before exchanging users.
- Maintain the same sitting in the lab. For more information please follow the link [https://msutexas.edu/return-to-campus/\\_assets/files/december-2020-reopening-taskforce-report.pdf](https://msutexas.edu/return-to-campus/_assets/files/december-2020-reopening-taskforce-report.pdf).

### **Exams**

See Grading Section for details – Three lecture exams are included in your course grade; see Grades section for details. All exams will have a time limit of 50 minutes for the two “midterm” exams and 110 minutes for the final exam. The exams will be scheduled to be either online or face to face based on the circumstances surrounding the pandemic.

### **Research Paper**

See Grading Section for details about content and format. All Research Papers must be submitted in Microsoft Word to [andrew.katumwehe@msutexas.edu](mailto:andrew.katumwehe@msutexas.edu) and paper copy via Dr. Katumwehe physical mailbox in Bolin 307H.

### **Lecture (Attendance) Extra Credit**

Limited extra credit opportunities will be available on an irregular and random basis during the lecture portion of the course. Each individual extra credit opportunity will be worth up to one (1.0) extra credit point. Generally, these opportunities will involve a short written response to a question or problem posed during the lecture or more often than not, simply your signature on an attendance sheet. (Therefore, bring paper and pen/pencil to lectures!). There will be 10 to 14 regular extra credit opportunities during the semester, take note that the final curve will be based on class attendance, participation, submission of all the assignments, lab works and final research paper.

### **Special Extra Credit**

No special extra credit opportunities however extra quizzes, attendance and on spot assessments are the way to make extra points.

## **Late Work**

Late work will be accepted through 04/22/2021 please refer to the conditions above. However, the following penalties will apply in all cases of late submittals: 10% for one day past due; 20% for two days past due; 30% for three days past due; after three days a grade of will be recorded. No course assignments will be accepted after 04/22/2021.

## **Important Dates on the spring 2021 schedule of classes.**

Last Day to drop this course with a grade of "W" is 4pm, April 23, 2021 Drops after this date will receive grades of "F." Refer to academic calendar: [Drops, Withdrawals & Void](#)

## **Desire-to-Learn (D2L)**

The MSU D2L program is a part of this course. Lectures, review materials, and course information will be available through D2L. 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.

## **Online Computer Requirements**

Taking a course with considerable online class requires you to have access to a computer with reasonable 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 may not be considered as 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 or an exam! 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 personal 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](#). **Attendance in this course is mandatory** in case where zoom is used for lecture purposes a link will be provided for the course.

## **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 semester is eligible for a 100% refund of applicable tuition and fees. Please verify this with the dates 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.

### **Services for Students with Disabilities**

In accordance with Section 504 of the Federal Rehabilitation Act of 1973 and the Americans with Disabilities Act (ADA) 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. 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](#).

### **College Policies**

Campus Carry Rules/Policies are given here: [Campus Carry Rules and Policies](#)

### **Smoking/Tobacco Policy**

College policy strictly prohibits the use of tobacco products in any building. Adult students may smoke outside and only in 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**

Students who wish to appeal a grade should consult the Midwestern State University [Undergraduate Catalog](#)

### **Notice**

Changes in the course syllabus, procedure, assignments, and schedule may be made at the discretion of the instructor. Changes will be communicated to all students through [D2L](#). Please check the course news on a regular basis for schedule updates and your school email.

Course schedule details are given on the next five pages. The first table lists lecture topics, textbook readings, and the three lecture exams. The second table

lists the dates for the lab topics, three lab quizzes, research paper due date, homework assignment due dates, and self-assessment assignments.



## Course Schedule – Lecture Topics and Exams, Text Reading (Page 1 of 3)

Date	Topic and Topic Number	Textbook Pages
11- Jan	Course Overview. What is Science? What is the Scientific Method? Geology as a Science. Why Study Geology?	Pages 2-13
13- Jan	Earth Systems	Pages 13-17
15- Jan	Internal Structure of the Earth <b>Assignment 1</b>	Pages 19-35
18-Jan	Martin Luther Day	
20- Jan	Plate Tectonics - Part 1	Pages 36-71
22- Jan	Plate Tectonics - Part 2 Assignment 2	Pages 36-71
25- Jan	Mineral and matter - Part 1. Basic Concepts	Pages 72-105
27- Jan	Mineralogy - Part 2. Important Mineral Classes <b>Assignment 3</b>	Pages 72-105
29- Jan	Igneous Rocks and Minerals - Part 1.	Pages 106-139
01- Jan	Igneous Rocks and Minerals - Part 2. Magma and Intrusive Igneous Activity	Pages 106-139
03- Feb	Igneous Rocks and Minerals - Part 3. Magma and Intrusive Igneous Activity	Pages 106-139
05- Feb	Igneous Rocks and Minerals - Part 3. Volcanoes and Associated Hazards <b>Assignment 4</b>	Pages 140-179
08- Feb	Weathering and Soil Formation	Pages 180-209
10- Feb	Sedimentary Rocks - Part 1.	Pages 210-239
12- Feb	Sedimentary Rocks - Part 2.	Pages 210-239
15- Feb	Sedimentary Rocks - Part 3. Sedimentary Textures and Depositional Environments <b>Assignment 5</b>	Pages 210-239
17- Feb	Energy and Mineral Resources. Diagenesis and Lithification; Economic Geology of Sedimentary Rocks excluding Oil and Gas	Pages 210-239

**Course Schedule – Lecture Topics and Exams, Text Reading (Page 3 of 3)**

Date	Topic and Topic Number	Textbook Pages
19- Feb	<b>Review 1</b>	
22- Feb	<b>FIRST EXAM</b> (will cover all material through Feb 18) - 10% of grade	N/A
24- Feb	Sedimentary Rocks - Part 5. Geology of Oil and Natural Gas <b>Assignment 6</b>	N/A
26- Feb	Metamorphic Rocks - Part 1. Metamorphism, Metamorphic Textures, Common Metamorphic Rocks	Pages 240-271
01- March	Metamorphic Rocks - Part 2. Burial/Regional Metamorphism	Pages 240-271
03- March	Metamorphic Rocks - Part 3. Contact and Hydrothermal Metamorphism; Economic Geology of Metamorphic Rocks <b>Assignment 7</b>	Pages 240-271
05- March	Time and Geology. Relative time and absolute time scale	Pages 272-281
08- March	Deformation - Folds and Fractures (continued)	Pages 302-325
10- March	Crustal Processes - Surface Geological Observations; Deformation - Folds and Fractures	Pages 302-325
12- March	Crustal Processes - Earthquakes	Pages 326-361
15- March	<b>SECOND EXAM</b> (will cover all material presented or assigned through March 12) - 20% of grade	
17- March	Crustal Processes - Oceans	Pages 386-417
19- March	Crustal Processes - Mountains	Pages 418-441
22- March	Crustal Processes - Mass Wasting	Pages 442-465
24- March	Crustal Processes - Mass Wasting <b>Assignment 8</b>	Pages 442-465
26- April	Crustal Processes - Surface and Running Water	Pages 466-499
05- April	Crustal Processes - Surface and Running Water <b>Assignment 9</b>	Pages 466-499

**Course Schedule – Lecture Topics and Exams, Text Reading (Page 3 of 3)**

Date	Topic and Topic Number	Textbook Pages
07- April	Crustal Processes - Ground Water	Pages 500-531
09- April	Crustal Processes - Ground Water <b>Assignment 10</b>	Pages 500-531
12- April	Crustal Processes - Glaciers	Pages 532-569
14- April	Crustal Processes - Part 7. Winds and Deserts <b>Assignment 11</b>	Pages 570-593
16- April	Crustal Processes - Part 8. Oceans and Shorelines	Pages 594-629
19- April	Climate Change -Small Planet	Pages 630-665
21- April	Climate Change – Part II <b>Assignment 12</b>	Pages 630-665
23- April	Geological History	
23- April	Course and Final Exam Review	Last Day to Submit Any Late Assignments! Grade Penalties per the Course Syllabus May Apply. Nothing accepted after 11PM CDT.
April 26- 10:30 am- 12:30 PM	<b>THIRD EXAM</b> (will cover all material presented in the lecture and the lab section of the course) - 20% of grade. Room and time per University Final Exam Schedule.	

**Course Schedule –for Labs, Lab Quizzes, Homework, Research Paper, and Assessments (Page 1 of 2) Monday, Tuesday, Thursday.**

Date (Week of date listed unless otherwise noted as a specific date)	Lab Topic, <b>Lab Quiz, Research Paper</b>	Homework and Self-Assessment Assignments
11,12,14 -Jan	Lab #1 - Mineral Identification – Lab Book Section 3	
18, 19,21 -Jan	Lab #2 Mineral Identification – Lab Book Section 3.	HW 1 and Assessment 1
25, 26, 28-Jan	Lab #3 Mineral Identification – Lab Book Section 3	HW 2 and Assessment 2
01, 02, 04-Feb	<b>Lab Mineral Quiz - 5% of grade.</b> Also, Lab #4 Introduction to Rocks - Lab Book Section 4	HW 3 and Assessment 3
08, 09, 11-Feb	Lab #5 Igneous Rocks - Lab Book Section 5	HW 4 and Assessment 4
15,16,18-Feb	Lab #6 Sedimentary Rocks – Lab Book Section 6	HW 5 and Assessment 5
22,23, 25-Feb	Lab #7 Metamorphic Rocks – Lab Book Section 7	HW 6 and Assessment 6
01, 02, 04-Mar	<b>Lab Rock and Mineral Quiz - 5% of grade;</b> Also, Lab #8 Dating of Rocks, Fossils, and Geological Events – Lab Book Section 8	HW 7 and Assessment 7
08, 09, 11-Mar	Lab #9 - Topographic Maps and Earthquakes	HW 8 and Assessment 8
15, 16, 18-Mar	Lab #10 - Geological Structures, Block Diagrams, and Maps	HW 9 and Assessment 9
22, 23, 25-Mar	Lab #11 River Processes and Hazards – Lab Book Section 11	HW 10 and Assessment 10
29, 30, 01- April	#12 Groundwater and Glaciers - Lab Book Sections 12 and 13	HW 11 and Assessment 11
05, 06, 08-April	Monday Lab Catch Up	

**Course Schedule –for Labs, Lab Quizzes, Homework, Research Paper, and Assessments (Page 2 of 2)**

Date (Week of date listed unless otherwise noted as a specific date)	Lab Topic, <b>Lab Quiz, Research Paper</b>	Homework and Self-Assessment Assignments
12, 13, 15-April		<b>Research Paper</b> Due by 4pm. Note: Paper and Electronic (MSWord) Versions Must Be Submitted! 5% of the final grade
12, 13, 15-April	<b>LAB FINAL QUIZ (includes Rocks and Minerals) - 10% of grade</b>	None
22-April		Last Day to Submit Any Late Assignments! Grade Penalties per the Course Syllabus May Apply

End of course syllabus