Course Syllabus: Physical Geology
McCoy College of Science, Mathematics, and Engineering
GEOS 1134-201
Spring 2020

Contact Information

Instructor: Dr. Andrew Katumwehe
Office: Bolin 307H
Lecture: MWF 9:00-9:50 AM RM 127
Lab: Mon 1:00-2:50 PM RM 115
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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. The topics include 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. During this course we 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 required 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 "quiet" 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.

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 may 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. Andrew 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 may 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 bot http). 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 with the words "GEOS Paper Spring 2019" 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 for details) and logical reasoning (up to 40% of paper grade). Note that 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 May 02 2020. The homework assignments will be posted in D2L and during laboratory lectures. Homework due dates are listed in the syllabus. Note: No homework, lab assignments, or research papers may be submitted after 05/02/2020. The Table below (next page) summarizes the grading policy for this course.

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

Graded Items	Contribution to Final Course Grade
Exam 1	10%
Exam 2	15%
Final Exam 3	20%
Lecture Quizzes	10%
Lab Overall Grade (includes lab quizzes, lab participation and attendance, homework assignments and assessments	40% (Labs for mineral and rock each 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. Andrew Katumwehe by email in advance of missing a lab section. Students who leave lab sections and class early may be marked absent.

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.

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 and paper copy via Dr. Andrew 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!). You may earn up to 4 points added to your final grade via these "regular" extra credit opportunities. 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
Special extra credit opportunities may also be announced during the semester. These opportunities, worth up to a total of one (1) special extra credit (added to your final calculated course grade) typically have included the scheduled Geology Colloquium talks or other special lectures or film showings on campus that pertain to geology or participation in Undergraduate Research presentations or evaluations.

Late Work
Late work will be accepted through 05/06/2020 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 zero may be recorded. No course assignments will be accepted after 05/10/2020.

Important Dates on the spring 2020 schedule of classes.
Last Day to drop this course with a grade of "W" is 4pm, March 30, 2020 Drops after this date will receive grades of "F." Refer to academic calender: 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.

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 (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 detail 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
22-Jan	Course Overview. What is Science? What is the Scientific Method? Geology as a Science. Why Study Geology?	Pages 2-13
24- Jan	Earth Systems	Pages 13-17
27- Jan	Internal Structure of the Earth **Assignment 1**	Pages 19-35
29- Jan	Plate Tectonics - Part 1	Pages 36-71
31- Jan	Plate Tectonics - Part 2 Assignment 2	Pages 36-71
03-Feb	Mineral and matter - Part 1. Basic Concepts	Pages 72-105
05-Feb	Mineralogy - Part 2. Important Mineral Classes **Assignment 3**	Pages 72-105
07-Feb	Igneous Rocks and Minerals - Part 1.	Pages 106-139
10-Feb	Igneous Rocks and Minerals - Part 2. Magma and Intrusive Igneous Activity	Pages 106-139
12-Feb	Igneous Rocks and Minerals - Part 3. Magma and Intrusive Igneous Activity	Pages 106-139
14-Feb	Igneous Rocks and Minerals - Part 3. Volcanoes and Associated Hazards **Assignment 4**	Pages 140-179
17-Feb	Weathering and Soil Formation	Pages 180-209
19-Feb	Sedimentary Rocks - Part 1.	Pages 210-239
21-Feb	Sedimentary Rocks - Part 2.	Pages 210-239
24-Feb	Sedimentary Rocks - Part 3. Sedimentary Textures and Depositional Environments **Assignment 5**	Pages 210-239
26- 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
28- Feb	**Review 1**	
02-March	**FIRST EXAM** (will cover all material through October 2) - 15% of grade	N/A
04-March	Sedimentary Rocks - Part 5. Geology of Oil and Natural Gas **Assignment 6**	N/A
06- March	Metamorphic Rocks - Part 1. Metamorphism, Metamorphic Textures, Common Metamorphic Rocks	Pages 240-271
09- March	Metamorphic Rocks - Part 2. Burial/Regional Metamorphism	Pages 240-271
11- March	Metamorphic Rocks - Part 3. Contact and Hydrothermal Metamorphism; Economic Geology of Metamorphic Rocks **Assignment 7**	Pages 240-271
13- March	Time and Geology. Relative time and absolute time scale	Pages 272-281
15- 19 March	**Spring break - No Classes**	
23- March	Deformation - Folds and Fractures (continued)	Pages 302-325
25- March	Crustal Processes - Surface Geological Observations; Deformation - Folds and Fractures	Pages 302-325
27- March	Crustal Processes - Earthquakes	Pages 326-361
30- March	**SECOND EXAM** (will cover all material presented or assigned through October 25) - 20% of grade	
01- April	Crustal Processes - Oceans	Pages 386-417
03-April	Crustal Processes - Mountains	Pages 418-441
06-April	Crustal Processes - Mass Wasting	Pages 442-465
08-April	Crustal Processes - Mass Wasting **Assignment 8**	Pages 442-465
10-April	Crustal Processes - Surface and Running Water	Pages 466-499
15-April	Crustal Processes - Surface and Running Water **Assignment 9**	Pages 466-499

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

Date	Topic and Topic Number	Textbook Pages
17-April	Crustal Processes - Ground Water	Pages 500-531
20-April	Crustal Processes - Ground Water **Assignment 10**	Pages 500-531
22-April	Crustal Processes - Glaciers	Pages 532-569
24-April	Crustal Processes - Part 7. Winds and Deserts **Assignment 11**	Pages 570-593
27-April	Crustal Processes - Part 8. Oceans and Shorelines	Pages 594-629
29-April	Climate Change -Small Planet	Pages 630-665
04-May	Climate Change – Part II **Assignment 12**	Pages 630-665
06-May	Geological History	
08-May	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.
11-May 08:00am-10:00am	**THIRD EXAM** (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)

Date (Week of date listed unless otherwise noted as a specific date)	Lab Topic, **Lab Quiz, Research Paper**	Homework and Self-Assessment Assignments
23-Jan	Lab #1 - Mineral Identification – Lab Book Section 3	
30-Jan	Lab #2 Mineral Identification – Lab Book Section 3. Note that T, Th Labs will meet as scheduled. Monday lab students will stay on schedule; any slippage will be made up later in the semester.	HW 1 and Assessment 1
06-Feb	Lab #3 Mineral Identification – Lab Book Section 3	HW 2 and Assessment 2
13-Feb	**Lab Mineral Quiz - 5% of grade**. Also, Lab #4 Introduction to Rocks - Lab Book Section 4	HW 3 and Assessment 3
20-Feb	Lab #5 Igneous Rocks - Lab Book Section 5	HW 4 and Assessment 4
27-Feb	Lab #6 Sedimentary Rocks – Lab Book Section 6	HW 5 and Assessment 5
05-March	Lab #7 Metamorphic Rocks – Lab Book Section 7	HW 6 and Assessment 6
12-March	**Lab Rock and Mineral Quiz - 5% of grade**; Also, Lab #8 Dating of Rocks, Fossils, and Geological Events – Lab Book Section 8	HW 7 and Assessment 7
15-20	**Spring Break**	
26-March	Lab #9 - Topographic Maps and Earthquakes	HW 8 and Assessment 8
02-April	Lab #10 - Geological Structures, Block Diagrams, and Maps	HW 9 and Assessment 9
09-April	Lab #11 River Processes and Hazards – Lab Book Section 11	HW 10 and Assessment 10
16-April	#12 Groundwater and Glaciers - Lab Book Sections 12 and 13	HW 11 and Assessment 11
23-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, **Lab Quiz, Research Paper**	Homework and Self-Assessment Assignments
30-April		**Research Paper** Due by 4pm. Note: Paper and Electronic (MSWord) Versions Must Be Submitted! 5% of the final grade
08-May	**LAB FINAL QUIZ (includes Rocks and Minerals) - 10% of grade**	None
09-Dec		Last Day to Submit Any Late Assignments! Grade Penalties per the Course Syllabus May Apply

End of course syllabus