

Course Syllabus: Structural Geology
McCoy College of Science, Mathematics, and Engineering
GEOS 3434-201 Structural Geology
Spring 2020

Contact Information

Instructor: Dr. Andrew Katumwehe

Office: Bolin 307H

Lecture: MWF 12:00-12:50 AM RM 115

Office hours: Mon-Wed and Friday: 1:00 – 5:00PM R: 9-10am and by appointment

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Course Description

This course introduces students to the nature of deformed earth materials, the processes of deformation, and the application of continuum mechanics in assessing deformation. It outlines the relationship between stress and strain and how these are preserved in the geological record. Describing and analyzing brittle and ductile structures including fractures, faults and folds. It also helps in understanding the relationship between mesoscopic planar and linear fabrics in relation to major brittle and ductile structures. This involves an analysis of regions of structural associations.

Other specific objectives:

- Understand stress and deformation
- Understand the information preserved in structural features
- Learn to quantify and mathematically manipulate structural information
- Understand structures in light of tectonism and orogenesis.
- Become proficient in extending limited two-dimensional information into a regional three-dimensional picture.

Required Textbook & Instructional Materials

Fossen, H. 2016. Structural Geology. Cambridge University Press. 463 p. ISBN: 978-1107-05764-7

Structural analysis and synthesis Lab required author: Rowland Edition:3RD 07

Publisher: WILEY ISBN: 9781405116527

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 = 85% of final grade. Exam 1 = 15% of final grade; Lecture Exam 2 = 15% of final grade; Final Exam = 25% 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. 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! 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 Quizzes may be submitted after 05/06/2020. 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	15%
Lecture Quizzes	10%
Lab Field Trip	10%
Lab Assignments and quizzes	30%
Lab final Project	10

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

I will issue specific assignments in class and lab. Completed work may be remitted to the professor in person, through his office mailbox (Bolin 307H), or by electronic submission. All submissions must be neat and legible.

Note: You may not submit a paper for a grade in this class that already has been (or will be) submitted for a grade in another course, unless you obtain the explicit written permission of me and the other instructor involved in advance.

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 – The class requires completion of a midterm and final examination. Both are timed exams; exam 1, midterm are in-class 50 minute exam, the final is a 2-hour exam. The instructor will provide additional information a week prior to the scheduled date. Three lecture exams are included in your course grade; see Grades section for details.

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 05/05/2020 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 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.

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
22-Jan	Course Overview and Introduction
24-Jan	Structural analysis
28-Jan	Plate Tectonics - Part 1
27-Jan	Deformation 1
29-Jan	Deformation II
31-Jan	Strain in rocks
03-Feb	Stress
05-Feb	Stress in the lithosphere
07-Feb	Rheology
10-Feb	Review Exam 1
12-Feb	Exam 1
14-Feb	Fractures
17-Feb	Faults I
19-Feb	Faults II
21-Feb	Kinematics of brittle regime
24-Feb	Kinematics of brittle regime
26-Feb	Deformation at micro scale
28-Feb	Deformation at micro scale
02-March	Folds and Folding I
04-March	Folds and Folding I
06-March	Folds and Folding II
09-March	Folds and Folding II
11-March	Foliation and cleavage
13-March	Foliation and cleavage
13-March	Exam 2
15-19 March	Spring break - No Classes
23-March	Foliation and cleavage
25-March	Lineations I
27-March	Lineations II
30-March	Boudinage I
01-April	Boudinage II
03-April	Stereonet I
06-April	Stereonet II
08-April	Structural Domains I
10-April	Structural Domains II
15-April	Contractual Domains I

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

Date	Topic and Topic Number
17-April	Contractual Domains II
20-April	Extensional regimes I
22-April	Extensional regimes
24-April	Strike slip systems I
27-April	Strike slip systems I
29-April	Strike slip systems II
04-May	Strike slip systems II
06-May	Final Exam Review
08-May	
13-May 08:00am-10:00am	THIRD EXAM (will cover all material presented in the lecture) - 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)

Course Schedule

Week	Date	Lab	Topic
Week 1	22-Jan	Rowland et al., Lab 1	Attitude adjustment
Week 2	29-Jan	Rowland et al., Lab 2	Outcrop patterns
Week 3	5-Feb	Rowland et al., Lab 3	Geologic Maps
Week 4	12-Feb	Rowland et al., Lab 4	Structure sections
Week 5	19-Feb	Brunton Lab	Pocket transit
Week 6	26-Feb	Rowland et al., Lab 5	Stereonets
Week 7	4-Mar	Rowland et al., Lab 6	Folds
Week 8	11-Mar	Review Lab	Planes and folds
Week 1	22-Jan	Rowland et al., Lab 1	Attitude adjustment
Week 2	29-Jan	Rowland et al., Lab 2	Outcrop patterns
Week 3	5-Feb	Rowland et al., Lab 3	Geologic Maps
Week 4	12-Feb	Rowland et al., Lab 4	Structure sections
Week 5	19-Feb	Brunton Lab	Pocket transit
Week 6	26-Feb	Rowland et al., Lab 5	Stereonets
Week 7	4-Mar	Rowland et al., Lab 6	Folds
Week 8	11-Mar	Review Lab	Planes and folds
Spring break	14-Mar	Field Trip	Big Bend region
Week 9	25-Mar	Rowland et al., Lab 7	Stereoanalysis
Week 10	1-Apr	Rowland et al., Lab 8	Secondary folds
Week 11	8-Apr	No lab	Easter week
Week 12	15-Apr	Rowland et al., Lab 9	Faults
Week 13	22-Apr	Rowland et al., Lab 10	Kinematics
Week 14	29-Apr	Rowland et al., Lab 11	Report guidelines
Saturday	2-May	Field Trip	Southern Oklahoma
Week 15	6-May	Final project	Report Due