

GEOL 622: GEOTECTONICS

Instructor: Dr. Zeynep Baran (zeynep.baran@sdsmt.edu)

Office & Office hours: MI 312; Monday 1:00-3:00 pm, Friday 1:00-2:00 pm

Meeting Schedule*: M 10:00-10:50 W 9:00-10:50 am, MI Room 324

Textbook(s): Global Tectonics 3rd Edition by Philip Kearey (Author), Keith A. Klepeis (Author), Frederick J. Vine (Author); ISBN-13: 978-1405107778; ISBN-10: 1405107774

(*) Our regular meeting schedule is MWF 10:00-10:50 am but students agreed on meeting two times a week as listed. Fridays can be still used to meet for make up the class periods missed due to national holidays.

Course Goals

- To provide a global overview of plate tectonic processes, including divergent, convergent and transform boundary settings and associated structures
- To describe the principal features of the different types of continental margins and evolving geologic processes
- To introduce the general geodynamic processes creating distinctive structures
- To discuss how tectonics can influence patterns of sedimentation, metamorphism, and igneous activities
- To emphasize the importance of these processes to society in terms of natural resources and natural hazards (particularly earthquakes)
- To develop written and oral communication and analytical skills

Learning Outcomes

At the end of this course, you should be able to:

- ✓ understand the basic tectonic principles and processes involved in different tectonic settings
- ✓ understand the features and processes producing distinctive major structures
- ✓ be familiar with current research areas and specific examples in the topics covered.
- ✓ be familiar with the basic geodynamic principles of plate tectonics.
- ✓ be aware of the impact of active tectonic processes on sedimentary processes, natural hazard mitigation and resource exploration.
- ✓ complete a literature review of a research topic and communicate this information clearly in scientific written and oral form with appropriate reference to source material.

Key Skills Acquired

- Generic skills
- Scientific report writing and presentation skills
- Data manipulation and analysis
- Integration of interdisciplinary data and subject matter
- Independent and critical thinking
- Application of geophysical, geochemical and remote sensing techniques to tectonics

Course Requirements and Expectations

a) Assignments:

In order to evaluate your performance in this graduate-level course, you will get reading assignments, homework assignments, and oral/written presentation assignments.

Reading Assignments: Required reading material will be posted online or sent via email. You will be responsible for in-class discussions and assignments related to the provided reading material. If you find an interesting article or book related to the course content, please do not hesitate to bring it in! Your contribution would always be appreciated.

Homework assignments: Alternatively, you will get homework assignments which may include problem sets, technical questions that require use of your prior knowledge and skills in core courses (i.e. sedimentology, structural geology, petrology). It is assumed that your knowledge and skills are competent in these core courses prior to registration in this class, and it is student's responsibility to make up deficiencies in those courses.

Term Paper and presentation: All students will design a research project and structure a research proposal at professional level. Your proposal can be up to 15 pages (max. text/figure ratio: 12/3). The details (format, organization etc.) will be explained in the class later in the semester. Your term paper should be on a different subject than your thesis/dissertation work.

In-class activities: In-class activities include giving mini-lectures or presentations, leading in-class discussions, participating in structuring a technical session at the end of the semester (Each student presents their term paper in GSA format-15 minute talk during a technical session organized by students. Other students and faculty can be invited to this session)

b) **Attendance:** Unless you have an acceptable excuse and inform me prior to missing a class, your absence more than 2 times is not acceptable. Because student's absence

usually make it hard to make up the missed content, your attendance is very important in this class.

- c) **Late assignments** will be subjected to grade reduction of %20 for each day, unless you have an acceptable excuse and inform your instructor ahead of time. If you do not turn in your assignment 3 days later than the due date without any acceptable excuse, it may not be accepted.
- d) **Grading:**

Assignments %40
Term paper %25
Presentations %25
In-class activities %10

- e) **Plagiarism:** COPY & PASTE ANSWERS are NOT acceptable in this class. I encourage you to use your own knowledge and skills, and do your best to improve your critical thinking ability during in-class discussions. In your reports, homework assignments and presentations make sure you give all references accordingly.

“The South Dakota Board of Regents has clearly defined those acts that constitute violations of academic integrity (BOR Policy 3.4.2.B.1 - Student Code of Conduct). These acts include, but are not limited to, cheating, fraud, plagiarism, or knowingly furnishing false information within the academic arena”

See the Conduct section in the catalog and the Policy Governing Academic Integrity for SDSM&T at <http://sdmines.sdsmt.edu/studentlife>. It will result, at a minimum, in a zero score for the assignment and/or further action following SDSMT regulations that include an ‘F’ for the course and referral to the Department Head and Vice-President for Academic Affairs. If you are concerned about the defining line here, please talk to me or check the SDSMT and Board of Regents policies at the following sites:

<http://resources.sdsmt.edu/catalog/policies-and-procedures.pdf>
<http://www.sdbor.edu/policy/4-Personnel/documents/4-42.pdf>

AMERICANS WITH DISABILITIES ACT STATEMENT

Students with special needs or requiring special accommodations should contact the instructor, and/or the campus ADA coordinator at 394-1924 at the **earliest** opportunity. For more information, please go to <http://counseling.sdsmt.edu/ada/>.

Course Schedule

Week	Date	Chapter	Subject
Week 1	Aug 24 M		Syllabus- Introduction
	Aug 26 W	Chapter 2	Internal Structure of the Earth
Week 2	Aug 31 M	Chapter 1-2	
	Sept 2 W	Chapter 1-2-3	Historical perspective and continental drift
Week 3	Sept 7 M	Labor Day	No class
	Sept 9 W	Chapter 4	Seafloor spreading
	Sept 11 F	Chapter 4	Assignment due on Sept 16
Week 4	Sept 14 M	Chapter 5	The framework of plate tectonics
	Sept 16 W		Paper due on Sept 23
Week 5	Sept 21 M	Chapter 6	Ocean Ridges
	Sept 23 W		Assignment due on Sept 30
Week 6	Sept 28 M	Chapter 7	Continental rifts and rifted margins
	Sept 30 W		Assignment due on Oct 7
Week 7	Oct 5 M	Chapter 8	Cont. Transforms and SST
	Oct 7 W		Assignment due on Oct 14
Week 8	October 12	Native American Day	No class
	Oct 14 W	Chapter 9	Subduction zones
	Oct 16 F		Assignment due on Oct 21
Week 9	Oct 19 M	Chapter 10	Orogenic belts
	Oct 21 W		Assignment due on Oct 28
Week 10	Oct 26 M	Chapter 11	Precambrian tectonics
	Oct 28 W		Assignment due on Nov 4
Week 11	Nov 2 M	Chapter 12	The mechanism of plate tectonics
	Nov 4 W		Assignment due on Nov 13
Week 12	Nov 9 M	Chapter 13	Implications of plate tectonics
	Nov 11 W	Veterans Day	No class
	Nov 13 F		
Week 13	Nov 16 M	Discussion	Term paper due on Nov 16
	Nov 18 W		Presentations