Spring 2019 Syllabus  
GEOL 309/L: Earth Tectonics and Structure

Course Structure  
Location: LO 1205  
Lecture: Monday, Wednesday 11:00am – 12:15pm  
Lab: Wednesday 2:00pm – 4:45pm

GEOL 309/309L is a three-unit lecture and one-unit lab course; three hours of lecture and three hours of lab work a week. There will be two one-day field trips associated with the course on February 23 and April 6. These are essential learning experiences.

Dr. Evans will be on maternity leave starting April 25. Class will meet and you will have assignments after this date.

General Management  
Contact: Professor Eileen Evans  
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PLF: Marshal McGurk  
Email: marshall.mcgurk.92@my.csun.edu

Office hours:  
Dr. Evans: LO 1226; Tuesdays 10:00 a.m. – 12:00 p.m. or by appointment  
Marshal: LO 1225; Wednesdays 1:00 p.m. – 2:00 p.m.

Course Objectives  
This course is an introductory-level class for students minoring in Geology, or majoring in the B.S. in Geology, or the B.S. in Geophysics. This course will introduce students to the forces that drive plate tectonics and the surface expressions of deformation structures associated with modern and ancient tectonic plate boundaries. Topics featured in the course include: Earth’s compositional and mechanical layers; the development of Plate Tectonics Theory; features of divergent, convergent and transform plate boundaries; patterns of folding and faulting, and earthquakes and associated hazards at plate boundaries and in intra-plate settings; geophysical techniques including seismology, geodesy, and magnetism; tectonic stresses and the strength of the lithosphere; and orogenesis through geologic time.

Students will learn to:  
1) Distinguish geophysical and geologic techniques that allow geoscientists to interpret the structure of Earth’s interior layers.  
2) Identify the distinctive geologic structures associated with the three types of plate boundaries.  
3) Relate the driving forces of plate tectonics to the surface development of these distinctive features of plate boundaries.  
4) Identify evidence for plate boundary interaction in the geologic past and interpret the evolution of plate movement through geologic time.

Course Materials  
Textbook: Earth Portrait of a Planet, by Steven Marshak, 5th edition, 981 pages. Additional articles and text chapters from other sources (see bibliography) will supplement this text:

Part I: Chapter 2, Journey to the Center of the Earth  
Part I: Chapter 3, Drifting Continents and Spreading Seas
Part I: Chapter 4, The Way the Earth Works: Plate Tectonics
Part III: Chapter 10, A Violent Pulse: Earthquakes with Interlude D The Earth’s Interior (geophysics)
Part III: Chapter 11, Crags, Cracks and Crumples: Crustal Deformation and Mountain Building

Bibliography: *(the following will be placed on reserve in the library)*
- The Solid Earth, C.M.R. Fowler, Published by Cambridge University Press.
- Looking into the Earth: An Introduction to Geological Geophysics, Alan E. Mussett and M. Aftab Khan, Published by Cambridge University Press.

**Evaluation and Grades**
There are distinctions between lecture and laboratory work related to this course structure, so you will receive different grades for each. A plus/minus grading scale will be used.

The proportion that each task will count toward your final grades in GEOL 309 is:
- Three questions inspired by reading assignments (submitted by 11:59pm Tuesday night of week assigned unless otherwise instructed) in-class quizzes (announced or pop quizzes), in-class activities, and homework 15%
- Signature assignment (Replaces Final Exam):
  - Tectonics research report: written 5-page report (15%)
  - Intermediate assignments:
    - Topic selection
    - Paper summaries
    - Annotated bibliography
    - Abstract
    - Rough Draft 15%
- Lecture Midterms (3) 50%
- Professionalism in the classroom and online 5%

The proportion that each task will count toward your final grades in GEOL 309/L is:
- Weekly lab quizzes 20%
- Weekly laboratory exercises 55%
- Field-trip exercises (‘Resident Expert’ posters) 20%
- Professionalism in the classroom and in the field 5%

**Attendance:** The amount of what you will learn, both in course material and in critical reasoning skills, depends upon your regular attendance, which includes attending for the entire class period, and keeping up with all assignments. The benefit and success of the group exercises depend on team efforts and require you to be in class. If you are absent and miss quizzes and exercises, there are no makeups. There is no make up for the field trip. You must make arrangements to have this weekend free.
Policies

I will accept late work for a penalty of 10% every day that the assignment is late. An assignment is considered ‘late’ whether it is turned in one minute or one hour after a deadline. Pay close attention to due date instructions given orally in class, embedded within lectures, or noted in assignments.

It is the student’s responsibility to know and follow the rules and policies that I have outlined in this syllabus. You agree to abide by these policies by accepting this syllabus and any subsequent updated syllabi. At times through the semester, it may become necessary for me to update the syllabus to match the topics and pace that we cover the material. Therefore, future syllabi may replace this version that you have received on the first day of class. You will find the updated syllabi on the Canvas page for this course.

I will often send important course information via email or Canvas. Check your account or Canvas for important ‘GEOL 309’ messages. University policy states that you are responsible for course information sent via email. Your responsibility includes understanding how to forward mail to an off-campus account (if you choose to do so), understanding how to download and save files sent via email and Canvas forum, and following instructions for assignments and deadlines sent via email and/or Canvas.

You can email me about course material or questions that you may have, but I will not be able to respond to your email immediately. I will respond to your email inquiry within 1 business day and during typical business hours, so keep this in mind when emailing me prior to a due date, an exam date, or on the weekend. I expect that you will write in a professional manner, which includes using standard salutations, professional titles, and formal language when corresponding via email.

You are required to take the exams as they are scheduled. Missing an exam will result in a “0” grade. Be sure to check the exam schedule immediately so that you avoid missing any exams. In the extremely rare event of an emergency, you must contact me as soon as possible, and administration of make-up exams will be at my discretion.

Academic Honesty

I expect that all work that you turn in will be your own. Official California State University policy states: “The maintenance of academic integrity and quality education is the responsibility of each student within this university and the California State University system. Cheating or plagiarism in connection with an academic program at a campus is listed in Section 41301, Title 5, California Code of Regulations, as an offense for which a student may be expelled, suspended, or given a less severe disciplinary sanction. Academic dishonesty is an especially serious offense and diminishes the quality of scholarship and defrauds those who depend upon the integrity of the campus programs. Such dishonesty includes but is not limited to: cheating, fabrication, facilitating academic dishonesty, and plagiarism.”

Failure to uphold the integrity of the academic environment at CSUN will be reported to the Office of the Vice President for Student Affairs and recommend disciplinary action. This includes, but is not limited to, plagiarism, copying answers during an exam, facilitating cheating by another student, or lying about an excuse for missing an assignment deadline or exam. Plagiarism includes the use of paragraphs or even long phrases and diagrams or parts of diagrams from peer or former student reports/labs/maps in your own assignment without proper acknowledgement of the source.

Accommodations

If you have a disability and need accommodations, please register with the Disability Resources and Educational Services (DRES) office or the National Center on Deafness (NCOD). The DRES office is located in Bayramian Hall, room 110 and can be reached at 818.677.2684. NCOD is located on Bertrand Street in Jeanne Chisholm Hall and can be reached at 818.677.2611. If you would like to discuss your need for accommodations with me, please contact me to set up an appointment.
Lecture Topics and primary reading

3 questions based on the reading (which may include supplementary reading) should be submitted by email or Canvas by 11:59pm every Tuesday night (Sunday night in Week 1). Lecture slides will be posted on Canvas, but any notes given on the board will not be.

1. **Plate Tectonics** - 5 weeks
   - Week 1 (Jan 23) Earth’s compositional and mechanical layers (Chapter 2, Marshak)
   - Week 2 (Jan 28, Jan 30) Drifting Continents and Spreading Seas (Chapter 3, Marshak)
   - Week 3 (Feb 4, 6) The Way the Earth Works: Plate Tectonics (Chapter 4, Marshak)

   **Feb 13 Deadline for selecting topic for written report**
   - Week 4 (Feb 11, 13) More Plate Tectonics (Chapter 11, Marshak)
   - Week 5 (Feb 18, 20) **MIDTERM Feb. 18** (Covers material in weeks 1-4), Relative plate motions

2. **Geophysics** – 5 weeks
   - Mar. 12 Deadline for journal article summaries
   - Week 6 (Feb 25, 27) Tectonics on a Globe: Euler poles (Chapter 2, Fowler; Supplementary Reading)

   **Mar. 6 Deadline for annotated bibliography**
   - Week 7 (Mar 4, 6) Global Tectonics and Wilson Cycles (Chapter 10 Marshak)

   **Mar. 6 Deadline for abstract**
   - Week 8 (Mar 11, 13) Seismology and Earthquakes (Chapter 5, Mussett & Khan)
   - Week 9 (Mar 18, 20) NO CLASS – Spring break recess

   **Mar. 7 Deadline for final paper rough draft**
   - Week 10 (Mar 25, 27) Geodesy (Reading TBA), Southern California Earthquakes
   - Week 11 (April 3) **MIDTERM April 3** (Covers material in weeks 5-10)

3. **Structural Geology** - 3 weeks
   - Week 12 (April 8, 10) Stress and Strain (Chapter 11, Marshak)

   **April 18 Deadline for term paper (10% Extra Credit with LRC slip)**
   - Week 13 (April 15, 17) Folds, Faults and Shear Zones (Chapter 11, Marshak)
   - Week 14 (April 22, 24) Faulting and Plate Tectonics, **MIDTERM 3 April 24** (Chapter 11, Marshak)

4. **Synthesis** – 2 weeks
   - Week 15 (April 29, May 1) Guest Lectures
   - Week 16 (May 6, 8) Guest Lectures
Laboratory Exercises:

- Week 1 (Jan 23) – Earth composition and structure
- Week 2 (Jan 30) – Paleomagnetism
- Week 3 (Feb 6) – Plate reconstruction I
- Week 4 (Feb 13) – Plate reconstruction II
- Week 5 (Feb 20) – Prepare for field trip

Field Trip Feb 23 (poster presentations)

- Week 6 (Feb 27) – Plate motions I
- Week 7 (March 6) – Plate motions II
- Week 8 (March 13) – Fault planes and focal mechanisms
- Week 9 (March 20) – NO LAB, Spring Recess
- Week 10 (March 27) – Geodesy
- Week 11 (April 3) – Prepare for field trip

Field Trip April 6 (poster presentations)

- Week 12 (April 10) – Geologic Structures
- Week 13 (April 17) – Stress and Strain, Rheology
- Week 14 (April 24) – NO LAB
- Week 15 (May 1) – NO LAB
- Week 16 (May 8) – NO LAB