GEOLGY 4063: PLATE TECTONICS

FALL 2014

MW 12:30 – 1:50       CAL 120

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CALLAWAY 101

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OFFICE HOURS: MW 10:00 – 12:00; MTWR 3:00 – 5:00

OVERVIEW: In this course we will examine structural, sedimentological, paleontological, petrologic, geochemical, and geophysical data as a means to reconstruct regional- to global-scale plate tectonic processes. There will be effectively two avenues of inquiry:

1) The physical geology and methodology of plate tectonics;
2) The historical geology of plate tectonics.

COURSE PHILOSOPHY: By its nature, geology is an interconnected and interdisciplinary science. Drawing on the combined knowledge of chemistry, physics, biology, mathematics and astronomy, it places the study of Earth processes and history within a soundly human framework. One of my main goals as a professor of geology is to help students understand the process of doing geology – to show you what questions to ask, how to make detailed observations, and how to appropriately interpret complex datasets. Embedded in this goal is the hope that you will leave this course as better thinkers and, therefore, as better geologists than you were 15 weeks earlier. If you and I can accomplish this goal, then the course was a success for both of us.

Toward those goals, this course is designed to help you think “outside the box” as geologists, by placing the fundamental knowledge gained in other courses within the unique theoretical framework of plate tectonics. You will read, listen, discuss, and write – all of these are ways to learn. You will refine your critical thinking skills by improving your ability to evaluate competing hypotheses and draw conclusions based on deductive and inductive reasoning. You will become better writers by practicing the writing process in a number of ways. I expect you to be engaged learners and to avoid being passive observers in the course.
**READING MATERIALS:** I expect you to read along with either of the books below this semester.


**EVALUATION:**

1) Exams – there will be two exams; these will focus on concepts central to plate tectonics and on the interpretation of tectonic features and processes in the geologic record.

2) In-Class Activities / Homework – there will be assignments spaced throughout the term. In-class writing-to-learn assignments will be assigned (more-or-less) randomly. These will be graded out of 3-5 points, depending on the complexity of the assignment; you must be present in class to earn points. Homework assignments will have specified due dates; any late work is subject to a penalty of 20% per day.

3) Project – a portion of class time will be devoted to completion of a major term project this semester, in which we will work together to develop, test, and assess tectonic problems associated with the evolution of the Southern Appalachians. This will include acquiring field measurements and hand specimens during the class field trip; preparing samples for petrographic and/or geochemical analysis; and writing a final abstract in GSA format. We will set the schedule for this trip during the first week of the term.

**ASSESSMENT:**

Each of the components listed above (Exams x 2, In-Class Activities/Homework, Project) will be 25% of your final grade. Final grades will be calculated on a percentage scale:

- A – 90% or above; B – 80-89%; C – 70-79%; D – 60-69%; F – below 60%

**A FEW TIPS:**

1. Stay organized. There will be significant work going on throughout the term, so it’s critical that you work within the assigned timelines – getting behind is a really poor strategy. Don’t do it if you can help it. Barring documented, extreme circumstances (as defined by the instructor), late work will be subjected to a 20% per day penalty.
2. The internet is a good source of ideas, but don’t believe everything that you read. You must base your research on printed, peer-reviewed, reliable data whenever possible. You should not use web sources as your sole source of information for your project topic.

3. Plagiarism of any sort will not be tolerated. Cite references any time you use ideas or words obtained from a particular source. The easiest way to avoid inadvertently copying a source is to write references down as you’re taking notes on the topic, rather than doing them last. Never copy and paste part of a reference into your working draft and “modify” it – this is just asking for trouble. Plagiarism includes cheating on exams as well. If you plagiarize, you will fail the course.

4. Check the CourseDen page for the course frequently. Especially towards the end of the term, we may change class meeting spaces in order to work on projects.

**Course Layout:**

<table>
<thead>
<tr>
<th>Topic</th>
<th>Readings (F = Frisch et al., K = Kearey et al.)</th>
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<tr>
<td>Introduction to Plate Tectonics</td>
<td>(F – Ch. 1; K – Ch. 1)</td>
</tr>
<tr>
<td>History of Plate Tectonics</td>
<td>(F – Ch. 1; K – Ch. 1)</td>
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<tr>
<td>Earth’s Interior</td>
<td>(K – Ch. 2)</td>
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<tr>
<td>Overview of Tectonic Features</td>
<td>(F – Ch. 1, 2; K – Ch. 3)</td>
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<tr>
<td>Divergent Boundaries</td>
<td>(F – Ch. 3, 4, 5; K – Ch. 4, 6, 7)</td>
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<td>Transform Boundaries</td>
<td>(F – Ch. 8; K – Ch. 4, 8)</td>
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<td>Convergent Margins</td>
<td>(F – Ch. 7, 9, 11; K – Ch. 9, 10)</td>
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<td>Precambrian Tectonics</td>
<td>(F – Ch. 10; K – Ch. 11)</td>
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<td>Supercontinent Cycles</td>
<td>(F – Ch. 9, 11; K – Ch. 11)</td>
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<td>Orogeny</td>
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**Important Dates:**

Field Trip: __________________ (Scheduled during 1st week of semester)

Final Instruction Period: Dec. 10th, 11:00 – 1:30