GG631: Geophysics - Solid, Fluid & Wave Mechanics  
Fall 2018

Instructor: Bridget Smith-Kontner  
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Meeting Time: T/Th 1:30-2:45pm  
Room: POST 702  
CRN: 87041

Course scope: The solid Earth deforms over a wide range of length scales, locations, and time scales, and in a variety of different ways in response to different forcing mechanisms. In this class, we will study continuum mechanics in geophysics, as applied to the deformation of Earth materials (elastic, viscoelastic, and plastic deformations) and seismic wave propagation (body waves, surface waves, anisotropy, and attenuation). Topics to be covered may include tensors, stress and strain in solids, rock failure, moment tensors, elasticity, ductile rheology, viscous flow, equations of motion & boundary conditions, the vector wave equation, wave field energy, reflection and transmission of seismic waves, and surface waves.

Class Notes (provided):  
Physics of Earth Materials, Agnew & Fialko (AF)

Alternate Texts:  
Geodynamics, Turcotte & Schubert (TS)  
Intro to Cont. Mech, Lai, Rubin, & Krempl (Lai)  
Intro to Seismology, Shearer

For the first section of this course, we will be using a thorough set of class notes provided by D. Agnew and Y. Fialko (AF), Physics of Earth Materials. These notes will be distributed electronically to you. For the later sections of the course, we will be reviewing sections of Introduction to Seismology by P. Shearer. The above textbooks are not required. We will further discuss textbook usage in class. Additional handouts and resources will be provided throughout class.

Grading

Notes: For this class, we are going to attempt a “flipped” classroom environment, where a majority of the standard “lecturing” (i.e., note taking) will be done outside of class. You will be provided a full set of class notes for each topic and will be expected to hand-write them or type them up for your own records. **Your class notes will comprise 10% of your grade.**

Collaborative in-class work: During most class meetings, you will be expected to work collaboratively with classmates (small groups) on in-class problems. These problems will sometimes be provided in advance, but you will not be expected to complete them until after we have had the opportunity to work through them together and share approaches at the board. **In-class participation and presentation will comprise 60% of your grade.** Here’s the breakdown:

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attendance</td>
<td>10%</td>
<td>Please attend every class. Excused absences (in advance) ok.</td>
</tr>
<tr>
<td>Class preparation</td>
<td>10%</td>
<td>Did you prepare(review class notes ahead of time?</td>
</tr>
<tr>
<td>Collaborative work</td>
<td>20%</td>
<td>Problem solving, assisting classmates, working together.</td>
</tr>
<tr>
<td>Summary/presentation</td>
<td>20%</td>
<td>Informal presentation of problem solutions at the board.</td>
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**Problem sets:** Completed problem sets will be collected the following class meeting (after we have had a chance to demonstrate them in class). This should provide you with the opportunity to review the approach and practice solving each problem on your own, if needed. **Completed problem sets will comprise 15% of your grade.**

**Journal paper reading assignments:** Lastly, we will also be reading relevant science papers in this class to expose you to real applications of geophysical topics we cover in class. For each paper, you will be asked to write a short (~ 1 page) summary that summarizes the paper, how it relates to class material, and the significance of the results. **Class reading assignments will comprise 15% of your grade.**

**Cooperation:** Collaboration is encouraged in order to discuss approaches to solving problems. However, do not copy answers to problem sets – work out the solutions yourself.

**GG Student Learning Objectives:** This course will introduce students to the following GG Department Student Learning Objectives (SLOs) for a M.S. degree: (1) Technical knowledge; (2) Scientific method; (3) Communicate geological knowledge. This course will introduce students to the following GG Department Student Learning Objectives (SLOs) for a Ph.D. degree: (1) Technical knowledge; (2) Expertise in a sub-discipline; (3) Scientific method; (4) Communicate geological knowledge

**Student Conduct and Academic Integrity:**
University guidelines for acceptable student conduct are very specific and will be strictly followed. Please read the guidelines (http://www.catalog.hawaii.edu/about-uh/campus-policies1.htm) and contact your instructor if you have any concerns. Fundamentals:

- Cheating, of any form, will not be tolerated.
- Blind copying of intellectual material (text) from resources such as books, journals, and the internet is plagiarism and is illegal. Instead, you should write things in your own words with a proper reference to your source. If any homework exercises require you to look up an answer in something else than a class textbook, I will expect you to reference the source and write it in your own words. *Any plagiarized work will receive “0” for the whole assignment and cannot be re-done or made up*

**Title IX**
The University of Hawai‘i is committed to providing a learning, working and living environment that promotes personal integrity, civility, and mutual respect and is free of all forms of sex discrimination and gender-based violence, including sexual assault, sexual harassment, gender-based harassment, domestic violence, dating violence, and stalking. If you or someone you know is experiencing any of these, the University has staff and resources on your campus to support and assist you. Staff can also direct you to resources that are in the community. Here are some of your options:
As members of the University faculty, your instructors are required to immediately report any incident of potential sex discrimination or gender-based violence to the campus Title IX Coordinator. Although the Title IX Coordinator and your instructors cannot guarantee confidentiality, you will still have options about how your case will be handled. Our goal is to make sure you are aware of the range of options available to you and have access to the resources and support you need.

If you wish to remain ANONYMOUS, speak with someone CONFIDENTIALLY, or would like to receive information and support in a CONFIDENTIAL setting, use the confidential resources available here:
http://www.manoa.hawaii.edu/titleix/resources.html#confidential

If you wish to directly REPORT an incident of sex discrimination or gender-based violence including sexual assault, sexual harassment, gender-based harassment, domestic violence, dating violence or stalking as well as receive information and support, contact: Dee Uwono Title IX Coordinator (808) 956-2299 t9uhm@hawaii.edu.