

# COURSE SYLLABUS

GEO 7600

Geophysics Seminar

Fall 2007

TR 12:00—12:50 rm 102

**Professor:** Tony Lowry (Department of Geology)  
• Geology Bldg Room 106 (Phone: 797-7096)  
• Email: arlowry@cc.usu.edu  
• Office Hours: 2:30—4:00pm (or by appt)

## COURSE DESCRIPTION

This seminar course will introduce (and survey the current literature on) the field of geodynamics, one of many disciplines within the realm of geophysics. We will focus on current papers relating to geodynamics of the lithosphere and asthenosphere (many of which are provocative or controversial) and discuss critically the physics, measurements and observations underlying each.

NOTE: The attached schedule looks rigid, but we may deviate from this.

### About the professor:

I am a geophysicist. My research focuses on measuring and understanding how and why planets deform. On Earth, this relates directly to processes of fault slip, earthquakes and volcanoes, but also has implications for mass transfer in the atmosphere, hydrosphere and cryosphere.

### Course Text:

Selected journal articles.

## SCHEDULE

Date	Topic
28 Aug	Orientation; Intro Lithosphere
30 Aug	The geotherm: Lithosphere = Thermal Boundary Layer?
4 Sep	Hasterok & Chapman, <i>J. Geophys. Res.</i> 112(B6) #B06415 2007.
6 Sep	Convection I: Plumes. Asthenosphere = Convection?
11 Sep	Kellogg & al., <i>Science</i> 283(5409), 1881-1884, 1999.
13 Sep	Convection II: Subduction.
18 Sep	McNamara & Zhong, <i>Nature</i> 437(7062), 1136-1139, 2005.
20 Sep	Convection III: Delamination.
25 Sep	Zandt & al., <i>Nature</i> 431(7004) 41-46, 2004.
27 Sep	Seismology I: Lithosphere = Seismic Lid?
2 Oct	Zandt & al., <i>J. Geophys. Res.</i> 100(B6), 10529-10548, 1995.
4 Oct	Seismology II: Asthenosphere & the red-ite/blue-ite schism
9 Oct	Smyth & al., <i>Phys. Earth &amp; Planet. Int.</i> 143, 271-278, 2004.
11 Oct	Seismology III: Lithosphere, Asthenosphere and anisotropy
16 Oct	Silver & Holt, <i>Science</i> 295(5557), 1054-1057, 2002.
18 Oct	Rheology I: Lithosphere = effective elastic thickness?
23 Oct	Pérez-Gussinyé & al., <i>G<sup>3</sup></i> 8, #Q05009, 2007.

25 Oct	Rheology II: Lithosphere = seismogenic layer?
30 Oct	Watts & Burov, <i>Earth Planet. Sci. Lett.</i> 213(1-2), 113-131, 2003.
1 Nov	Rheology III: What flexural rigidity REALLY means
6 Nov	Pérez-Gussinyé & al., $G^3$ , in review, 2007.
8 Nov	Rheology IV: Lithosphere = Tectonic Plate?
13 Nov	Mierdel & al., <i>Science</i> 315(5810), 364-368, 2007.
15 Nov	Major element chemistry: Lithosphere = Tectosphere?
20 Nov	Forte & Perry, <i>Science</i> 290(5498), 1940-1944, 2000; Schutt & Leshner, <i>J. Geophys. Res.</i> B5(111), #B05401, 2006.
22 Nov	(Thanksgiving Break)
27 Nov	Geochemistry I: Asthenosphere = distinct mantle reservoir?
29 Nov	TBA
4 Dec	Geochemistry II:
6 Dec	TBA

### **Semester Projects Due 6 Dec at class-time**

Updated course schedule at

<http://anquetil.colorado.edu/~arlowry/Geo7600/index.html>

#### **Grading:**

Exercises	25%
Class discussions/discussion leads	25%
<u>Semester Project and Presentation</u>	<u>50%</u>

**Notice to students with disabilities:** Students with physical, sensory, emotional or medical impairments may be eligible for reasonable accommodations in accordance with the Americans with Disabilities Act and Section 504 of the Rehabilitation Act of 1973. If you have a disability that will likely require some accommodation by the instructor, you must contact the instructor and document the disability through the Disability Resource Center (DRC) in Room 101 of the University Inn, 797-2444 voice, 797-0740 TTY, or toll free at 1-800-259-2966, preferably during the first week of the course. Any requests for special considerations relating to attendance, pedagogy, taking of examinations, etc. must be discussed with and approved by the instructor. In cooperation with the Disability Resource Center, course materials can be provided in alternative formats--large print, audio, diskette or Braille.