

## GEOLOGY 415/515 - QUATERNARY GLOBAL CHANGE

**“Spring” Semester, 2007, Tuesday and Thursday 10-11:15**

Instructor: Glenn Thackray, P.S. 231, 236-3560, thacglen@isu.edu  
 Text: Readings from a variety of text, journal, and online sources

**Emphasis:** This course focuses on global change during the recent geologic past. We will address changes in climatic, geomorphic, sedimentologic and biologic systems through the last 2.5 million years, and discuss the causes and implications of those changes. The course will focus on both theory and practice. The broad learning goals for this course are to a) become conversant in the concepts and records of global change and b) to learn techniques of geomorphic and sedimentologic analysis useful both in the study of past global changes and in the application of surficial geology to real-world problems.

<u>Dates</u>	<u>Topic</u>	
January 8	<b>The Quaternary and approaches to its study</b>	
January 9-11	Why is the Quaternary different; recent controversies; development of the glacial theory; Earth systems science and the Q	GSSC, 2007 Imbrie and Imbrie 1979
January 16-18	A primer on terrestrial sedimentology	
January 23-25	Correlating events and changes: Dating methods	
	<b>The cryosphere</b>	
January 30- March 6	Cryospheric systems: Ice sheets and mountain glacier processes; glacial geomorphology and sedimentology; ice sheet and mountain glacier records	
<b>March 8</b>	<b>Midterm exam</b>	
<i>March 10-18</i>	<i>Spring Break</i>	
	<b>The hydrosphere and a little more cryosphere</b>	
March 20-22	Lacustrine processes and records	
March 27-April 5	Marine sediments and Polar ice cores	
April 10	Case study: Heinrich events	
<b>April 12-19</b>	<b>Student research presentations</b>	
	<b>The Biosphere</b>	
April 24-26	Biospheric systems: Pollen, insect, and vertebrate fossils	
	<b>The hydro, cryo, bio, atmo, and lithospheres working together</b>	
May 1	Bringing it all together: the last glacial interglacial cycle	
May 3	Bringing it all together: the Holocene, the LIA, and the last 100 years	
<b>May 8</b>	<b>Final Exam, Tuesday 10 AM-noon</b>	

This is a schedule that I will make every attempt to stick to, but chances are we will drift from it at times

**A note on readings:** There is, unfortunately, no one solid text that covers the breadth of this course. Rather than having you buy an expensive text and try to shoehorn it into the course, I will assign reading from a variety of sources, including texts, journal literature, online resources, and even the mass media. Readings will generally be placed in the reading room for your perusal. Where I have the resources in electronic form, I will post them on the department's Glacier server. If you wish to purchase some of the sources, I will make some recommendations early in the semester.

### **Problem sets**

Problem sets will be assigned episodically throughout the semester. They are designed to amplify lecture material and to introduce you to specific techniques. Please be nice to me (and your grade!) by turning in neat, clear work. Show your work!! Because we will need to grade each exercise as a group, they must be turned in on time. *Late submissions will be penalized.*

### **Field exercises**

To develop skills of geomorphic and sedimentologic observation, we will complete 2 field projects during the semester. Given the lovely and consistent weather during this semester, we can of course schedule them firmly and plan on good weather. Just joking! We will need to work around the weather. Each project will include 1 or 2 days of field observation, analysis of data, and writing of short reports. To help us plan, I have reserved vehicles for 5 Fridays during the semester. We will use 2 or 3 of these Fridays. As any glaciated area in the region is snow-covered during this semester, we will focus instead on lacustrine-fluvial stratigraphy in Marsh Valley, and (probably) eolian stratigraphy in the Blackfoot dune field. Dates scheduled: Feb 2, Mar 2, Mar 23, Apr 6, Apr 27

### **Research Paper and Class Presentation**

A research paper and class presentation, on a topic of your choosing, will be required of all students. The graduate paper will be of greater magnitude and expectations. Details and some example topics will follow soon. Note that presentations will take place about 2/3 into the semester, rather than at the end. This schedule will permit progress and feedback on your presentation before the schedule gets too crazy. To help me guide you on your topic, please start your research early and submit a short paragraph describing your topic, and a list of major references, by Feb. 15

### **Grading**

*Undergraduates:*

Exam 1	20%
Final exam	20%
Problem sets and field projects	30%
Research paper	20%
Presentation	10%

*Graduates:*

Exam 1	20%
Final exam	20%
Problem sets and field projects	20%
Research paper	25%
Presentation	10%

The final exam will be partly comprehensive. Exams will be graded on separate curves for undergraduate and graduate sections of the class.

**Getting Help**

Scheduled office hours will be announced. Those are times when I am definitely available for help. And I am around the department (and variably available) most of the week. By all means, contact me one way or another if you need assistance, and we can arrange a time to meet if necessary.

*Our program is committed to all students achieving their potential. If you have a disability or think you have a disability (physical, learning disability, hearing, vision, psychiatric) which may need a reasonable accommodation, please contact the ADA Disabilities & Resource Center located in Graveley Hall, Room 123, 282-3599 as early as possible.*