Geosci 563: GLACIAL GEOLOGY  Fall, 2009

Lectures  Tu Th 9:30-10:45 AM
Morrill 4N Room 161,
Spire # 33757

Lab  Tuesdays 1:00 - 5:00 PM
Morrill 4N Room 161,
Spire# 33758
Or by arrangements

Instructor: Julie Brigham-Grette
Professor
Office: Room 247, Morrill 2
Phone: 413-545-4840
Email: Juliebg@geo.umass.edu

Office Hours:  Mondays 1-3 PM
Thursdays 1:30-3 PM or
By appointment anytime!!

Required Textbooks (2):

Required Field Guide (1):

Suggested Purchase: three-ring binder for all of the handouts and lab materials I will give you over the semester -- a good way to stay organized. I will supply all lab materials.

Grading:  2 Hourly Pyramid exams = 20% (10% each)
1 Final Take Home Exam = 25% (comprehensive)
Labs/In-class Exercises = 40% (No Lab Final)
Term Paper and Presentation = 15%

Term papers are to be on any aspect related to glaciology, glacial geology or applied studies if glacigenic materials (i.e., landform genesis, mapping and field interpretation, stratigraphy, hydrogeologic studies, paleoclimate, civil engineering problems, etc). Especially if you are a graduate student, I suggest you do something relevant to your research that is problem-oriented, perhaps this could develop into a chapter of your thesis with the permission of your advisor. Literature review papers will be restricted to undergraduates, if possible. I strongly encourage creativity; work with maps, air photos, remote sensing, use and interpretation of real data from databanks like the NGDC (http://www.ngdc.noaa.gov/paleo/) or the National Snow and Ice Data Center (http://www-nsidc.colorado.edu/index.html). Mandatory Paper outlines are due Oct. 29th. Need help with your writing? Typed papers not longer than ~10 pages, double-spaced, submitted by Nov. 24th will be text edited at no penalty and returned for revision well ahead of the Dec. 11th DEADLINE. No late papers;
Get on it early! I will prod you if you need it; you can also prod me if I need it.

At the end of the semester during lab on Dec. 8th, everyone is expected to give a short 10-12 minute presentation on a term paper. This is an opportunity to practice your skills at presenting scientific material in a concise way. No matter where you go or what you do after UMass, when you apply for a job you will first be asked about your writing skills, communication skills and whether you can think independently. Now is the time to work on writing, speaking and PowerPoint skills among friends; the biggest factor is self-confidence! By December we will all be good friends; it should be fun and a good way to learn what everyone else has been working on.

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IN-CLASS SCHEDULE

• NB: Readings listed here to the right are required and will be discussed in class. Note that in that in addition to these, a few journal readings may be on Reserve in Room 254 on the honor system; a few references you'll have to dig out yourself. I will also send you PDFs on occasion.
• I expect everyone to come to class. If you must miss class or a lab due to illness, doctor appointment, or a family emergency, please let me know by phone or email so that we can arrange for you to get handouts, notes etc. Some labs are easy to make up; others are not.
• You must be prepared for “Sediment of the Week” – nearly every Thursday. You might get the black dot!!
• I am active at a national and international level in research related to the Quaternary sciences and I will bring this research into the classroom and share my excitement for what I do. On the other hand, I also need to travel at various times throughout the semester and will do my best to let you know in advance of any changes. The schedule below reflects my efforts to ensure you will enjoy the class. Please note that I will be at the GSA and AGU national meetings. I am in Granada Spain for the ACE meeting talking about Arctic/Antarctic connections during the first week of classes. Readings, assignments and guest lectures will fill in.

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Readings (pages in Benn and Evans)</th>
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<tbody>
<tr>
<td>T 8 Sept.</td>
<td>Introduction/Planning</td>
<td>Sub</td>
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<tr>
<td>Th 10</td>
<td>Great Movies</td>
<td>Sub</td>
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<td>T 15 Sept.</td>
<td>Glacial systems, New England history</td>
<td>1-13; Ridge review 2003</td>
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<tr>
<td>Th 17 Sept.</td>
<td>Milankovitch &amp; isotopes in glacial history</td>
<td>1-13; 49-63; 90-93</td>
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<td>T 22 Sept.</td>
<td>Ice properties; snow facies; thermal properties</td>
<td>66-74; 95-96</td>
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<td>Th 24 Sept.</td>
<td>ELAs and Glacier Mass Balance</td>
<td>74-90,</td>
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<td>T 29 Sept.</td>
<td>Glacier Flow and Ice sheet Profiles</td>
<td>Chapter 4</td>
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<td>Th 1 October</td>
<td>The Role of Water; fluvial systems</td>
<td>Chapter 3</td>
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T 6 Oct.       Subglacial erosion                  178-210, JBG in Moscow
T h 8 Oct.    Entrainment and Transport          Chapter 6
T 13 Oct.     Monday Schedule - no class
Th 15 Oct.    Facies and Glacial Tills          378-399; 404-411
T 20 Oct.     First Exam                        JBG at GSA-Portland OR
Th 22 Oct.    Facies and Tills cont            422-506; JBG flying back
T 27 Oct.     Subglacial Sediment-Landform associations Chapter 11
Th 29 Oct.    Erosional Landforms               Chapter 9 (Paper outlines DUE)
T 3 Nov       Erosional Landscapes              Chapter 9
Th 5 Nov      Moraines and Ice marginal associations Chapter 11; Gustavson and Boothroyd, 1987
T 10 Nov.     Glacial Land Systems 1            Chapter 12
Th 12 Nov.    Glacial Land Systems 2            Chapter 12
T 17 Nov.     SECOND EXAM                      JBG in Wash DC – Polar Research Board
Th 19 Nov.    Glaciolacustrine systems          Chapter 8; Ridge and Larson, 1990
                               It fills the valleys ‘round here!
T 24 Nov.     Glaciomarine sediments           Chapter 8
Th 26 Nov     Thanksgiving Holiday             Enjoy!!!!!
T 1 Dec.      Offshore stratigraphy             Chapter 13; Oldale papers on New England
Th 3 Dec.     Glacio-isostasy                   27-39
T 8 Dec.      Eustasy                           27-39
Th 10 Dec.    Eolian sediments (Loess et al.)   Menzies Vol.2-Chapter 6
Fr 11 Dec.    Final Papers due in my mailbox   Last day of classes
14-18 Dec     Exam week – take home exam        JBG at AGU – San Francisco

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LABORATORY SCHEDULE
Please be prepared for some flexibility in the schedule due to weather etc.

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<thead>
<tr>
<th>Week</th>
<th>Date (Tues)</th>
<th>Topic</th>
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<tbody>
<tr>
<td>1</td>
<td>8 Sept</td>
<td>No lab this week</td>
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| 2    | 15 Sept     | **Field trip:** Intro to Glacial Landscapes and Surficial Maps  
| 3    | 22 Sept     | **Field Trip:** Field descriptions and standards |
| 4    | 29 Sept     | Topo vs. Surficial Maps – reading lines |
| 5    | 6 Oct       | Computer project: Ice Sheet Reconstructions |
| 6    | 13 Oct      | No class – Monday class schedule followed |
| 7    | 20 Oct      | **Field Trip:** Glacial Erosion and Tills (guest lead) |
| 8    | 27 Oct      | **Field Trip:** Glacial Deposition / fabrics |
| 9    | 3 Nov       | **Field Trip:** Lacustrine Deposition |
| 10   | 10 Nov      | Morphosequences, Landforms and Subsurface mapping (Stones?) |
| 11   | 17 Nov      | Aerial photos and glacial landscapes (guest lead) |
| 12   | 24 Nov      | Isostasy and Eustasy (why marine silt/clay blankets the coast) |
| 13   | 1 Dec       | MAPS and 3-dimensional mapping |
| 14   | 8 Dec       | Term Paper Presentations and Review |

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