Syllabus for GEO-SCI 445, Sedimentology Fall 2007, UMASS Amherst
Lecture TuTh, 11:15-12:30

Sedimentology is the scientific study of the classification, origin, and interpretation of sediments and sedimentary rocks, while stratigraphy is the science of studying stratified rock. Therefore, this course is focused A) on the basics of sedimentology and stratigraphy, B) on the analysis and interpretation of modern and paleo-environments of rivers, lakes, oceans, coral reefs etc., and C) on studying applications of sedimentology and stratigraphy in an environmental and economic context.

Week 1
Sept. 4 Introduction
Sept. 6 Rock cycle, weathering, erosion and soil formation

Week 2
Sept. 11 Sediment transport and deposition: Fundamentals of fluid dynamics
Sept. 13 Sediment transport and deposition: fluvial, eolian and wave transport, gravity flow and turbidites

Week 3
Sept. 18 Sedimentary textures: grain size, sorting, shape, etc.
Sept. 20 Sedimentary structures: lamination, ripples, cross-bedding etc.

Week 4
Sept. 25 Siliciclastic sedimentary rocks, classifications
Sept. 27 Siliciclastic diagenesis

Week 5
Oct. 2 Carbonate sedimentary rocks, classification
Oct. 4 Carbonate diagenesis

Week 6
Oct. 9 MONDAY SCHEDULE (NO CLASS)
Oct. 11 Biochemical and evaporitic rocks

Week 7
Oct. 16 Coil and oil source rocks
Oct. 18 Fluvial depositional environments

Week 8
Oct. 23 Eolian and lacustrine environments
Oct. 25 Glacial environments

Week 9
Oct. 30 MIDTERM EXAM
Nov. 1 Derivation of grain size curve equations (Matt Walsh)

Week 10
Nov. 6 work on grain size lab (Matt Walsh)
Nov. 8 work on grain size lab (Matt Walsh)

Week 11
Nov. 13 Deltaic and beach barrier island environments
Nov. 15 Estuarine, lagoonal and tidal environments

Week 12
Nov. 20 Siliciclastic marine environments
Nov. 22 THANKSGIVING BREAK

Week 13
Nov. 27 Carbonate marine environments
Nov. 29 Principles of stratigraphy, lithostratigraphy

Week 14
Dec. 4 Seismic-, magneto-, and biostratigraphy
Dec. 6 Chronostratigraphy and geologic time

Week 15
Dec. 11 Sequence stratigraphy in siliciclastic systems
Dec. 13 Basin analysis, plate tectonics and sedimentation

Week 16
Final exam
Laboratory and field exercises for GEO-SCI 445: Sedimentology-lab, M, 1:25-4:25

Week 1  No lab
Week 2  9/10  Field Trip – Mt. Sugarloaf, Deerfield Basin, basics of sed field work
Week 3  9/17  Field Trip – Chard Pond I (Turners Fall Fm. and Mt Toby Conglomerate)
Week 4  9/24  Field Trip – Chard Pond II
Week 5  10/1  Field Trip – Chard Pond III
Week 6  10/9  Field Trip – Greenfield (Sugarloaf Arkose fluvial redbeds)
Week 7  10/15 Field Trip – Greenfield (Sugarloaf Arkose through Deerfield Basalt)
Week 8  10/22 Field Trip – Roaring Brook (Mt Toby Conglomerate alluvial fan)
Week 9  10/29 Lab Exercise – depositional system videos and midterm review
Week 10  11/5 Lab Exercise – grain size curves
Week 11  11/14 Field Trip – Barton Cove I (Turners Fall Fm and breccia)
Week 12  11/19 Field Trip – Barton Cove II (Sedimentary structures)
Week 13  11/26 Lab Exercise – Determining paleocurrent directions
Week 14  12/3 Lab Exercise – using well log data
Week 15  12/10 Lab Exercise – sequence stratigraphy

Grading policy
Attendance of laboratory exercises and fieldtrips is mandatory. Lab reports and fieldtrip reports are due ONE WEEK after the lab day on which field work is completed. Late reports will be marked down, and reports more than one week late may not be accepted. Reports will be graded and combined, along with grading of your FIELD BOOK, to a final lab grade normalized to 100%. The lab grade is part of the final grade of the class. The final grade is composed of:

  30% mid term exam
  30% lab grade
  40% final exam
# Reading assignments for Sedimentology Fall 2007

**Textbook:**

*Principles of Sedimentology and Stratigraphy*

4th edition, Sam Boggs, Jr.

Prentice Hall, 2006


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<th>Week</th>
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<tr>
<td>Week 1</td>
<td>no reading</td>
<td>Chapter 1, p. 3-20</td>
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<td>Week 2</td>
<td>Chapter 2, p. 21-27</td>
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<td>Week 3</td>
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<td>Week 4</td>
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<td>Week 9</td>
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<td>Week 15</td>
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