

Sedimentology is the scientific study of sediments and sedimentary rocks and of the processes by which they were formed (sedimentation)

Stratigraphy is the scientific study of rock strata, and the determination of the order, geographic, and tectonic disposition of the original succession, and the age relations therein

CLASS MEETINGS M, W, F 11:00 – 11:50, WSB-130

FIELD TRIP(s) *Lake Sediment Coring – Weekend(s) - to be arranged*
Trip to: St. Anthony Falls Laboratory (Minneapolis) - afternoon – to be arranged
Limnological Research Center, University of Minnesota – Whole weekday – to be arranged
SCSU Research Colloquium – On campus – Tuesday April 19th
Minnesota Groundwater Association Spring Meeting – Whole Day – DATE NOT YET ANNOUNCED

ROOM WSB-130 (Lectures) and the Dirt Lab (WSB-41) and Interdisciplinary Research Lab (WSB-16)

INSTRUCTOR Dr. Kate Pound
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Office Hours: *To be posted (and by appointment or when my door is open)*

D2L and WEBSITE A D2L site will be set up for this course. Some class materials will be posted on this site.

OBJECTIVES / GOALS / ORGANIZATION

By the end of this course you should be able to:

- Describe sediment samples and sedimentary rocks accurately using the correct technical terminology
- Construct and interpret sediment grain size distribution curves
- Explain and follow sedimentology laboratory procedures
- Describe and interpret sediment bedforms
- Identify, describe and interpret sedimentary structures and trace fossils
- Explain the use and varied applications of the term sedimentary facies
- Describe and identify the processes and sedimentary/stratigraphic features associated with different depositional environments
- Identify likely depositional environments based on the description / illustration of sedimentary and stratigraphic features associated with an outcrop, core, or series of exposures / cores
- Identify and describe clastic sedimentary rocks in thin section
- Use and apply the North American Stratigraphic Code
- Explain and apply the principles of seismic stratigraphy, sequence stratigraphy, and magnetostratigraphy
- Explain and apply the principles of biostratigraphy and chronostratigraphy
- Explain and apply the steps undertaken in a basin analysis
- Make a professional powerpoint presentation on characteristics of a specified depositional setting
- Create and present a research poster on the work you completed on the Lake sediment core

GRADING:

Your grade will be determined as shown below. Shaded grades will be used. A range = 90-100; B range is 80-90; C range is 70-80; D range is 60-70; F is below 60. The exams may or may not be curved.

In-Class Work	30%
'Lab' Assignments	15%
Exams (12.5%, 12.5% & 15%)	40%
Research work: Poster	15%
Total	100%

TEXTBOOK:

Sedimentary Petrology – An Introduction to the Origin of Sedimentary Rocks (3rd edition), Maurice E. Tucker, Blackwell Science, 262 p., ISBN: 0-632-05735-1

Download (and/or Print) or just access online (it is *v-e-r-y l-o-n-g* and would use tons of paper): The Petrology of Sedimentary Rocks, R.L. Folk from <http://www.lib.utexas.edu/geo/folkready/folkprefrev.html> . A copy will be available in the Dirt Lab / Research Lab. A variety of other readings will be posted in D2L.

CLASSROOM / LAB EQUIPMENT

You will need to bring pencils, colored pencils, erasers, rulers, calculators and hand lenses to class. Storage space will be designated for maps and samples that you may be working with. I very strongly recommend a 3-ring binder – I will be giving you lots of handouts, assignments and labs, and you will need to keep track of them. You will need a composition book to use as a Lab notebook.

REMINDERS

This is an upper-level class. I expect you to be in class, and to keep track of when assignments are due. We will be doing some lab work during class; there is also work I expect you to do outside of class. I cannot give individual tuition or make-ups if you miss class. I will give you an annotated class guide at the start of each week (maybe even each class – we will see ...) – I expect you to put as much care into your work as I put into making the guides (Note: This does NOT mean you have to draw animals and goofy, unprofessional captions in the work you hand in ☺).

Spring 2016 Tentative Schedule AHS 423/523 Stratigraphy & Sedimentology

Date	Topic	Textbook Rdg.	In-class and 'Lab' Assignments
Mon 11 th Jan	Introduction, Sediment Description, Lake Coring Explanation	Ch. 1, p.1-10; Ch. 2, p.11-20 Handouts	Sedimentology vs. Stratigraphy Exercise
Weds 13 th Jan	Sediment Description, Munsell Color Chart	Handouts	Sediment Description
Fri 15 th Jan	Munsell Color Chart Exercise	Handouts	Color Exercise
Mon 18 th Jan	Martin Luther King Day – No Classes		
Weds 20 th Jan	Grain size classification; rounding, angularity, and sphericity	Ch. 2, p.11-21 Handouts	
Fri 22 nd Jan	Grain Size sieving and graphing	Ch. 2, p.11-18 Handouts	Sieve Calculations & Graphing
Mon 25 th Jan	Lab work: Sieving	Handouts	Sieving Lab
Weds 27 th Jan	Lab Work: Settling – Clays and Silts	Handouts	Hydrometer ((Silt & Clay) Lab
Fri 29 th Jan	Texture: Cobble and Boulder Shape	Handouts	Zingg Exercise
Mon 1 st Feb	Lab work: 1-2 mm grain counts; Smear slides	Handouts	Smear Slide(s) 1-2 mm Grain count
Weds 3 rd Feb	Transportational and Depositional mechanisms	Ch. 2, p.23-25 Handouts	Image Exercise
Fri 5 th Feb	EXAM I		
Mon 8 th Feb	Sedimentary Structures Bedding and Lamination Cross Bedding, Facing Directions	Ch. 2, p.23-40 Handouts	Images Exercise
Weds 10 th Feb			Samples Exercise
Fri 12 th Feb			Cross Bedding Exercise
Mon 15 th Feb	Presidents Day – No Classes		
Weds 17 th Feb	Paleocurrent Data: Rose Diagrams	Ch. 2, p.40-42 Handouts	Paleocurrent Exercise
Fri 19 th Feb	Siliciclastic Sediments Detrital Composition: QFL Classification	Ch. 2, p.42-55 Handouts	Plotting Exercise
Mon 22 nd Feb	Diagenesis and Cementation	Ch. 2, p.55-60 Handouts	Images
Weds 24 th Feb	Mudrocks Lake sediment classification	Ch. 3, p.92-109 Handouts	Plotting
Fri 26 th Feb	Lake Sediments: Analytical Tools	Handouts	Data Analysis
Mon 29 th Feb	Biostratigraphy & Chronostratigraphy; Stratigraphic Code	Handouts	Exercise
Weds 2 nd Mar	Intro to Depositional Environments Measured Sections	Ch. 2, p. 65-91 Handouts	Exercise

Fri 4 th Mar	EXAM II		
Mon 7 th Mar Weds 9 th Mar Fri 11 th Mar	Spring Break		
Mon 14 th Mar Weds 16 th Mar Fri 18 th Mar	Lake Sediment Core Work, Depositional Environment Presentation Preparation		
Mon 21 st Mar	Evaporites	Ch. 5, p.166-181, Handouts	Samples
Weds 23 rd Mar	Sedimentary Iron Deposits	Ch. 6, p.182-193, Handouts	Samples
Fri 25 th Mar	Phosphate Deposits	Ch. 7, p.194-198, Handouts	Examples
Mon 28 th Mar	Coal, Oil, Shale, Petroleum	Ch. 8, p.199-211, Handouts	Samples
Weds 30 th Mar	Cherts, Siliceous sediments	Ch. 9, p.212-220, Handouts	Samples
Fri 1 st April	Faculty Duty Day – No Classes		
Mon 4 th April	Braided Streams & Meandering Streams	Handouts	Comparison/prediction
Weds 6 th April	Alluvial Fans, Fan Deltas	Handouts	Comparison
Fri 8 th April	Continental Glaciation	Handouts	Prediction/Analysis
Mon 11 th April	Beaches	Handouts	Prediction
Weds 13 th April	Shelves and Slopes	Handouts	Seismic Stratigraphy
Fri 15 th April	Submarine Fans, Basins, Turbidites	Handouts	Sections
Mon 18 th April	Volcaniclastics	Ch. 10, p.221-229; Handouts	Samples
Tues April 19 th	Student Research Colloquium		
Weds 20 th April	Volcaniclastics	Ch. 10, p.221-229, Handouts	Sections
Fri 22 nd April	Carbonate sediments	Ch. 4, p.110-165, Handouts	Samples
Mon 25 th April	Carbonate Sediments	Ch. 4, p.110-165, Handouts	Sections
Weds 27 th April	Regional Stratigraphy Stratigraphic Code	Handouts	Exercise
Fri 29 th April	Regional Stratigraphy Stratigraphic Code	Handouts	Exercise

FINAL EXAM 9:55 am – 12:10 pm, Monday May 2nd, WSB-130