GEOL 216: Sedimentology

Syllabus

Instructor: Dr. Antun Husinec, ahusinec@stlawu.edu,
Office: Brown Hall, Room #105, phone (515) 229-5248
Office hours: M&W 10:00-12:00AM, Th 4:30-5:30PM, *or by appointment*
Lectures: M, W, F 8:30AM - 9:30AM, BR 143-4
Labs: Th 1:15PM - 4:15PM, BR-141

TEXTBOOK (REQUIRED)

Prothero, D.R. and Schwab, F., 2004, Sedimentary Geology: An Introduction to Sedimentary Rocks and Stratigraphy, 2nd edition: W.H. Freeman and Company, New York, 557 p.

SUPPLEMENTAL READING

Tucker, M.E., 2003, Sedimentary Rocks in the Field, 3rd edition: John Wiley & Sons, New York, 234 p.

FREE, ON-LINE TEXT

Folk, R.L., The Petrology of Sedimentary Rocks, Hemphill Publishing Co., Austin, TX.

COURSE NOTES

Each lecture has a handout that provides material essential for understanding the lecture. These handouts, along with some other course materials, are available for free download at the SLU ANGEL Learning Management Suite (https://angel.stlawu.edu). You should download lecture handouts before the start of each class. This allows you to follow along as I tend to use lots of pictures and graphs in my PowerPoint presentations. The best strategy is to pay attention and add your own comments on the handouts as we progress. You can treat the collection of lecture handouts as an additional textbook. You should get a three-ring binder in order to keep the handouts organized.

COURSE DESCRIPTION

The purpose of this course is to provide an integrated overview of the science of sedimentology. Emphasis will be placed on the processes of sedimentation and their products in different depositional environments, and post-depositional modification. Field and laboratory analyses will focus on the description and classification of sedimentary rocks, and on the interpretation of their origin.

COURSE GOALS

(1) To understand the processes that erode, transport, and deposit sediments;
(2) to observe the characteristics and interpret the origins of sedimentary rocks; and
(3) to comprehend how the study of sedimentary processes can help us better understand ancient environments and manage modern environmental change.

COURSE EXPECTATIONS

Attendance and active participation is required at all classes, labs, and field trips, and students are expected to be on time as a courtesy to one another. You are allowed three "cuts" or unexcused absences. Missing a fourth class will result in an automatic 0.25 reduction to the final course grade! Additional 0.25 grade reductions will be incurred for each additional absence. Excused absences are for reasons beyond your control and are unavoidable, such as being hospitalized. You may need to provide documentation if asked.
Reading assignments should be completed prior to class. Regarding presentations, students who fail to give their presentation on the scheduled date will be given an automatic zero for the entire assignment. Under extreme circumstances, presentations may be rescheduled.

LAB POLICIES

Labs are due at the start of Lab the following week unless otherwise instructed. Make sure you bring a hand lens, and I will provide you with a grain size card. If an assignment is not submitted on the date it is due (and no extension has been granted), it receives an automatic zero. Many labs will be done as team activities, but the write-ups are expected to be your own work. Labs are to be placed in your lab instructor's box outside Brown 144. Please note that as part of department policy late labs cannot be accepted by your instructor.
Many of the labs early in the semester will be field trips. Bring warm outer clothing to these labs because you will be working outside for several hours (e.g. bring gloves, jacket, hat, boots). Unless provided by the instructor, you will also need to bring field notebook, rock hammer, acid bottle, hand lens, grain size card, and hard hat (for quarries). Please contact Mr. Matt VanBrocklin regarding the equipment available at the department.

COURSE SCHEDULE

(May be subject to modification as the semester progresses to allow the most effective completion of all field and in-class activities). Readings are from Prothero & Schwab, unless otherwise stated.

WEEK #	DATE	DAY	LECTURE TOPIC	READINGS
1	8/29/2008	F	Introduction to sedimentology	p. 2-17
2	9/1/2008	M	*No class. Instructor at IAS Meeting in Bochum, Germany*	
	9/3/2008	W		
	9/5/2008	F	Conglomerate and breccia	p. 66-76
3	9/8/2008	M	Sandstone composition & texture	p. 76-91
	9/10/2008	W	Sandstone classification	p. 91-98
	9/12/2008	F	Mudrocks	p. 99-113
4	9/15/2008	M	Non-skeletal grain types of carbonate rocks	p. 212-219, 222-225
	9/17/2008	W	Skeletal grain types of carbonate rocks	p. 219-221
	9/19/2008	F	Carbonate rock types	p. 224-226; T&W[1] p. 18-22
5	9/22/2008	M	Other biogenic rocks	p. 263-275
	9/24/2008	W	Chemical & non-epiclastic sedimentary rocks	p. 276-300
	9/26/2008	F	Weathering	p. 18-25
6	9/29/2008	M	Soils and paleosols	p. 26-30

	10/1/2008	W	Clastic transport	p. 31-38
	10/3/2008	F	Wet or fluid-assisted mass-wasting	p. 39-44
7	10/6/2008	M	*No classes. Instructor at GSA Meeting in Houston*	
	10/8/2008	W		
	10/10/2008	F	Sedimentary structures I: Plane bedding and unidirectional current structures	p. 45-50
8	10/13/2008	M	Sedimentary structures II: Multidirectional flow structures and bedding plane structures	p. 51-55
	10/15/2008	W	Sedimentary structures III: Mechanically produced structures and biogenic structures	p. 56-64
	10/17/2008	F	*No class. Mid-semester break*	
9	10/20/2008	M	Sedimentary structures III: Mechanically produced structures and biogenic structures	p. 56-64
	10/22/2008	W	Alluvial fans & braided fluvial systems	p. 127-138
	10/24/2008	F	**MID-TERM EXAM**	
10	10/27/2008	M	Meandering fluvial systems & lacustrine deposits	p. 139-149
	10/29/2008	W	Eolian & glacial deposits	p. 150-158
	10/31/2008	F	Deltas & peritidal environments	p. 159-171
11	11/3/2008	M	Barrier complexes and clastic shelf deposits	p. 171-188
	11/5/2008	W	Continental slope and rise sediments & pelagic sediments	p. 189-209
	11/7/2008	F	Carbonate depositional environments I	p. 236-259
12	11/10/2008	M	Carbonate depositional environments II	revisit p. 236-259
	11/12/2008	W	Stratigraphy: concepts & lithostratigraphy	p. 302-319, revisit Box 15.1 (p. 334-338)
	11/14/2008	F	Lithostratigraphy, *cont.*	p. 319-322, 328-333
13	11/17/2008	M	Sea level: Definitions, drivers and reconstruction methods	p. 322-328, C[2] p. 38-46
	11/19/2008	W	Case study: Bahama-like Adriatic platform	H&R[3] p. 317-337
	11/21/2008	F	Biostratigraphy	p. 341-355
14	11/24/2008	M	*Thanksgiving recess*	
	11/26/2008	W		
	11/28/2008	F		
15	12/1/2008	M	Well logging & sequence stratigraphy	p. 356-376
	12/3/2008	W	Basin Analysis	p. 423-440
	12/5/2008	F	Student presentations	
16	12/8/2008	M	Siliciclastic diagenesis	p. 114-126
	12/10/2008	W	Limestone diagenesis & dolomitization	p. 226-235
	12/12/2008	F	Course summary. Future of sedimentology.	S[4] p. 2-9
17	12/14/2008	W	**FINAL EXAM**	

WEEK #	DATE	LAB TOPIC	READINGS
1	9/1/2008	*No lab. Instructor at IAS Meeting in Bochum, Germany*	
2	9/8/2008	*In Field: Hannawa Falls*	*TBA*
3	9/15/2008	*In Field: Hannawa Falls*	*TBA*
4	9/22/2008	*In Field: Alexandria Bay*	*TBA*
5	9/29/2008	*In Field: Parmeter Quarry*	*TBA*
6	10/6/2008	*No lab. Instructor at GSA Meeting in Houston*	
7	10/13/2008	*In Field: Parishville*	*TBA*
8	10/20/2008	*In Field: Morristown*	*TBA*
9	10/27/2008	Siliciclastic rocks	T[5] p. 32-40, 67-77
10	11/3/2008	Siliciclastic rocks in thin section	revisit T[5] p. 32-40, 67-77
11	11/10/2008	Grain types of carbonate rocks	T[5] p. 40-50
12	11/17/2008	Carbonate rock types	revisit T[5] p. 40-50
13	11/24/2008	*Thanksgiving recess*	
14	11/1/2008	Sedimentary structures & paleocurrent analysis	p. 45-54
15	12/8/2008	Isopach maps and stratigraphic cross sections	p. 426-437
16	12/15/2008	**LAB PRACTICAL**	

[1]T&W *Tucker, M.E. and Wright, V.P., 1990, Carbonate Sedimentology: Blackwell Science, 482 p.*
[2]C *Coe, A.L., 2003, The Sedimentary Record of Sea-Level Change: The Open University and Cambridge University Press, 288 p.*
[3]*H&R Husinec, A. and Read, J.F., 2008, The Late Jurassic Tithonian, a greenhouse phase in the Middle Jurassic–Early Cretaceous 'cool' mode: evidence from the cyclic Adriatic Platform, Croatia: Sedimentology, 54, p. 317-337.*
[4]S *Schlager, W., 2000, The future of applied sedimentary geology: Journal of Sedimentary Research, 70, p. 2-9.*
[5]T *Tucker, M.E., 2003, Sedimentary Rocks in the Field, 3rd edition: John Wiley & Sons, New York, 234 p.*

GRADING

Theory exams (mid-term 15%, and final 25%) based on lecture material and reading 40%, lab practical 20%, lab & field trip write-ups 15%, term paper 15%, and presentation 10%. Class and lab attendance is essential to pass the course. Final grade will be consistent with the 0 to 4 grading scale, and will be determined as follows:

Percent range	Final grade	Percent range	Final grade
97.01 or more	**4**	76.01-79.00	**2.25**
94.01-97.00	**3.75**	73.01-76.00	**2**
91.01-94.00	**3.5**	70.01-73.00	**1.75**
88.01-91.00	**3.25**	67.01-70.00	**1.5**
85.01-88.00	**3**	64.01-67.00	**1.25**
82.01-85.00	**2.75**	61.01-64.00	**1**
79.01-82.00	**2.5**	61.00 or less	**0**

HONOR CODE

At St. Lawrence, all members of the University community have a responsibility to see that standards of honesty and integrity are maintained. It is the responsibility of each student to learn and understand the standards of academic integrity expected at St. Lawrence, as expressed in the University's academic honor code. Additional information regarding academic honesty, plagiarism and academic dishonesty procedures and penalties can be found in the Student Handbook.