

Revised Course Description and Syllabus
Sedimentology and Stratigraphy (GEOL 44070/54070)
Kent State University Department of Geology
Spring 2012

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Course Number: Undergrad: Geol 44070 (Sections 1&2) Graduate: Geol 54070 (Sections 1&2)	Registrar's CRN Number: Undergrad Section 1: 13733; Section 2: 13734 Graduate Section 1: 13740; Section 2: 13741
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Lecture (Section 1&2)
McGilvrey 234 (Unless otherwise noted)
TR 2:15 – 3:30 pm

Laboratory: McGilvrey 116
Section 1: W: 12:05 - 1:45 pm
Section 2: W: 3:20 - 5:00 pm

Material is subject to revision as needed; Please check the class website or instructor for additional information.

Office Hours: TR: 10:30-11:30 am, 3:30-5:00pm; W: 2:15-3:15 pm; or by appointment.

Course Rationale and Objectives: The record of Earth's history is writ large in its sedimentary strata. Unraveling the contents of this great book requires specific geological skills and a considerable amount of detective work! Students in this upper level course will be introduced to the systematics of sedimentary rocks and the processes by which they form, erode, and are transformed by early diagenesis. Emphasis will be placed on understanding the underlying principles of sedimentation and their controls on various temporal and spatial scales. A variety of environments will be studied so that the results of these processes can be recognized in the field. In addition to classical approaches, special note will be made of new techniques used in high resolution sedimentological research, particularly non-invasive sediment logging methods (e.g. Diffuse Spectral Reflectance) and geochemical stratigraphy (e.g. $\delta^{18}\text{O}$ of biogenic calcite). These techniques are employed by the instructor as part of his active research. Lectures will be integrated with weekly labs and at least two required field trips.

Topics to be covered:

- Sediments and Sedimentary Rocks – genesis, types, distribution, and alteration
- Siliciclastic versus biogenic sedimentation
- Clastic transport and fluid flow
- Lithostratigraphy and facies relationships
- Sedimentary environments: Terrestrial, coastal, marine
- Geochronology and Chronostratigraphy
- High Resolution stratigraphic methods (e.g. core and well logging, chemostratigraphy)
- Sequence Stratigraphy

Text and additional reading:

- *Principles of Sedimentology and Stratigraphy, (Fifth Edition)*, by Sam Boggs, Jr., Prentice Hall, 2012, ISBN-13 978-0-321-64318-6.
(Note: You may find a third or fourth edition of the text, but there are considerable differences as described on the class website.)
- Handouts and selected readings as assigned during the term.

Prerequisites and Suggested Courses: Earth Materials II (GEOL 31070), and Invertebrate Paleontology (GEOL 34061), or permission of the instructor. Completion of Geomorphology (GEO32066) before enrolling in Sedimentology and Stratigraphy is highly encouraged. Students are also expected to be familiar with Excel spreadsheet functions and quantitative manipulation of data through cell formulas. Training in the use of Excel is provided in Scientific Methods in Geology (GEOL 42035), through the Geology tutoring lab (see above) or the KSU library 60 minute seminar series. While this class provides excellent preparation for Geology Summer Field Camp (GEOL 4/5092), traditionally about half of the students in the department complete Field Camp prior to talking Sedimentology and Stratigraphy due to various scheduling constraints.

Course web site: <http://www.personal.kent.edu/~jortiz/strat/>

Note that as with all internet resources, access to or availability of the web site cannot be guaranteed. Exams will not be rescheduled. Please use the resources available on the web site in advance of exams.

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Office Hours and Consultation with the Instructor: I want you to do well in the class! I welcome questions from all students either in person, by email, or by phone. Whether you are doing well in the course, are on academic probation, or think that you may find the course challenging, attending office hours can help make the course a more enriching experience. Please use your university email account when you contact me. This is university policy and will ensure your privacy when sending electronic messages. Include your first and last name and your banner id number on any electronic correspondence. Please cc a copy of any important messages that you send to the instructor back to yourself so that you have a record.

Grading Policy: Sedimentology and Stratigraphy is required of Geology BS majors at Kent State University. Class assignments, and in particular Midterm #3, will require you to employ and integrate concepts from the class prerequisites (Earth Materials II and Invertebrate Paleontology) with the material covered in this class. Students are thus expected to attend all class sessions, keep up with the reading, consult the online resources provided by the instructor, and complete all of the exam and class assignments.

Grades will be determined as follows:

Three Midterms (each worth 15%)	45%
Average Grade on Lab Assignments	15%
Grade on Field Guide/Report	15%
Cumulative Final Exam	25%
Total	100%

Grading may be on a curved scale at the discretion of the instructor, but each student has the potential to succeed in this course. When grades are available, they will be posted to the University's secure server using Blackboard Vista. To access Blackboard Vista, login to the flashline portal (<http://flashline.kent.edu>), then click to "My Classes" and login to Blackboard Vista to access your grades online. Assignments will also be passed back to help students prepare for the cumulative final.

Exam Dates: Please contact the instructor immediately if you have a conflict with the exam dates as listed in the class schedule attached to the syllabus or as listed on the website.

Assignment due dates, group activities, and late policy: Lab and Field Assignments are due at the beginning of the lab period following the one in which they were handed out unless otherwise specified. Lab assignments for reading and discussion days will be typed, critique of the reading handed in at the beginning of the lab session, and active participation in the class discussion. Many lab assignments will be conducted in groups. Each group may turn in one copy of their group assignment with each member's name listed. All group members are expected to contribute equally to all components of the assignment. You are required to know all of the material assigned as part of the labs and readings. If there are any concerns regarding your lab group, please contact the TA or instructor as soon as possible. Unexcused late assignments will be docked 1/3 grade per day (i.e., A => A- => B+ => B...).

Make up Exams: Students who miss an exam must provide a written documentation in order to receive a make up assignment. Legitimate excuses include the following: your own illness, a death in the family, military or official university athletic commitments. If you are involved in military or official university athletic activities, review the exam schedule at the beginning of the term and consult with the instructor prior to the exam if you have a conflict. If an illness, personal crisis, or family tragedy causes you to miss an exam, you must contact the instructor by phone or email no later than 48 hours after the scheduled start time of the exam. It is very important that you provide your full name, email address, and a telephone number where you can be reached in your phone or email message.

Field Trips: At least two weekend field trips are required for this course. We will discuss proper report organization and professional writing in lab. Please contact the instructor immediately if you have a conflict with the dates for the field trips as listed in the class schedule attached to the syllabus or as listed on the website. Please note that weather is often quite variable during spring term. We usually camp during the extended field trip, but we will stay in hotels if the weather does not cooperate. Please plan ahead in terms of your finances in the event that we need to change our plans on short notice.

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University Policies: The following University policies apply to anyone enrolled in this course:

- 1. University Calendar:** The official university calendar, which provides information on deadlines for university-related transactions can be found at: http://www.kent.edu/registrar/calendars/stu_spring.cfm
- 2. Enrollment Status:** Students are responsible for ensuring that they are properly enrolled in their classes. The official registration deadline for this course is January 22, 2012 (see the university calendar for late registration deadlines and late fee information, etc.). You are advised to review your official class schedule during the first two weeks of the semester and prior to the drop and withdrawal dates to ensure that you are properly enrolled in this class and section. University policy requires all students to be officially registered in each class they are attending. Students who are not officially registered for a course by published deadlines should not be attending classes and will not receive credit or a grade for the course.
- 3. Academic Honor Code:** All students in the course are expected to abide by the academic honor code, as specified in the University's Policy Register. The use of other's intellectual property without giving them appropriate credit is a serious academic offense. This includes copying answers, misrepresenting the source, nature or other conditions of your academic work to get undeserved credit. At a minimum, students caught cheating during exams will receive a midterm grade of zero, which will count for 50% of their overall average midterm score, and the incident will be reported to the university. It is the University's policy that cheating or plagiarism can result in receiving a failing grade for the course or other more serious disciplinary action depending on the nature of the offense. Repeat offenses can result in dismissal from the University. For complete information see the: Kent State University Policy Register, Chap. 3, section 3-01-8
- 4. Withdrawal:** For Spring term, the last day to drop a class before a grade of W is applied is January 22, 2012. Withdrawal from any or all courses is permitted up to the withdrawal date for the semester, or until the prorated deadline for flexibly scheduled sections. For the Spring term the deadline to withdraw with a grade of W entered on your transcript is March 18, 2012. After that time, students are considered to be committed to all remaining courses and must complete them. If students are unable to complete the semester because of extreme circumstances that first occur after the deadline, students should consult their college or campus dean's office. No approval is required to withdraw from a course during the withdrawal period. For more information see: http://www.kent.edu/registrar/calendars/stu_spring.cfm.
- 5. Students with Documented Accommodation needs:** Students who require health-related accommodations must verify their eligibility through the Office of Student Accessibility Services (SAS) on the Ground Floor of the DeWeese Health Center (330-672-3391 or <http://www.kent.edu/sas>). In accordance with University policy, if you have a documented need for a health-related accommodation to obtain equal access to this course, please contact the instructor at the beginning of the semester or when given an assignment for which an accommodation is required. If you have any questions regarding a potential accommodation need, please contact the instructor and SAS as soon as possible.
- 6. Final Exam Dates:** Please check the final exam schedule for the classes in which you are enrolled. This can be found on the web at: http://www.kent.edu/registrar/calendars/spring_finalsch.cfm. In the event that you have two exams scheduled at the same time, the instructor will make suitable arrangements. Students who have conflicts or more than three examinations on the same day should consult with the Dean of his or her college at the earliest possible time for assistance in making alternative arrangements.

Spring 2012 Sedimentology and Stratigraphy Class Schedule

Week	Date	Lecture Number and Title	Reading
1	Jan 10 Jan 11 Jan 12	1. T: Significance of Sedimentary Geology W: Lab 1, Siliclastic sedimentary rock classification 2. R: Physical Properties of sediments, sedimentary rocks	Ch. 1 Handout, TBA Ch. 3
2	Jan 17 Jan 18 Jan 19	3. T: Siliclastic Sedimentary Rocks W: Lab 2, Reading and Discussion (Black Shales) 4. R: Sediment transport mechanisms	Ch. 5 Handouts, TBA Ch. 2
3	Jan 24 Jan 25 Jan 26	5. T: Sedimentary Structures W: Lab 3, Sedimentary structures: Identification 6. R: Depositional systems, Facies, and Walther's Law	Ch. 4 Handouts, TBA Ch. 8
4	Jan 31 Feb 1 Feb 2	T: Exam I W: Lab 4, Sedimentary structures: Generation 7. R: Fluvial and Lacustrine Systems	Handouts, TBA Ch. 8.2, 8.4
5	Feb 7 Feb 8 Feb 9	8. T: Eolian and Deltaic Systems W: Lab 5, "Are we now living in the Anthropocene?" 9. R: Siliclastic Tidal and Beach Systems	Ch. 8.3, 9.1-9.2 Handouts, TBA Ch. 9.3-9.6
6	Feb 14 Feb 15 Feb 16	10. T: Siliclastic Marginal Marine Systems W: Lab 6, Facies Model Interpretation 11. R: Pelagic (Deep water) Systems	Ch. 10.1-10.2 Handouts, TBA Ch. 10.3
7	Feb 21 Feb 22 Feb 23	12. T: Carbonate Sedimentary Rocks W: Lab 7, Carbonate Petrology 13. R: Shallow water carbonate systems (No class – Independent Reading)	Ch. 6 Handouts, TBA Ch. 11.1-11.5
8	Feb 28 Feb 29 Mar 1	14. T: Evaporites and evaporitic systems W: Stratigraphic Principles and units 15. R: Exam II	Ch. 7.1-7.2; 11.6 Ch. 12.1-12.3
9	Mar 6 Mar 7 Mar 8	16. T: Lithostratigraphy; Nature of the Stratigraphic Record W: Lab 8, Turbidity Currents, Part 1 17. R: Classical Biostratigraphy	Ch. 12.4-12.6 Handouts, TBA Ch. 14
10	Mar 13 Mar 14 Mar 15	18. T: Quantitative Biostratigraphy W: Lab 9, Turbidity Currents, Part 2, and Group Research on Field Guide 19. R: Core and Wire-line Logging	Handouts, TBA Handouts, TBA Handouts, TBA
	Mar 19-25	<i>No classes, Spring Break</i>	
11	Mar 27 Mar 28 Mar 29	20. T: Magnetostratigraphy and Chemostratigraphy W: Geologic Time and Radiometric Dating 21. R: Exam III (75 minute duration)	Ch. 13.1, 13.4; 15 Ch. 15
12	Apr 3 Apr 4 Apr 5	22. T: Seismic Stratigraphy W: Lab 10, Group Research on Field Guide 23. R: Plate Tectonics and sedimentation	Ch. 13.2-13.3 Ch. 16.1-16.3
13	Apr 10 Apr 11 Apr 12	24. T: Basin Analysis W: Lab 11, Presentation of W. Virginia Field Guide 25. R: Sea level change and sedimentation	Ch. 16.4-16.7 Handouts, TBA Handouts, TBA
	Apr 13-15	<i>Overnight weekend field trip, Southern West Virginia</i>	
14	Apr 17 Apr 18 Apr 19	26. T: Sequence Stratigraphy – theory W: Lab 12, Reading and discussion- "More Gaps than Record" and "Marxist Stratigraphy and the Golden Spike" 27. R: Sequence Stratigraphy – application	Ch. 13.3 Handouts, TBA Handouts, TBA
15	Apr 24 Apr 25 Apr 26	28. T: Sedimentary Resources W: Lab 13: Reading and discussion- "Excerpts from the N. American Stratigraphic code" and "Simplifying the Stratigraphy of Time" 29. R: The future of sedimentology and stratigraphy	Ch. 7 Handouts, TBA Handouts, TBA
		<i>End of class sessions</i>	
16	May 4	Final Exam, McGilvrey Hall Room 234 3:15- 5:30 p.m. Friday, May 4, 2012	