

# ESCI 5601W ADVANCED SEDIMENTOLOGY - Fall 2013 (Earth Science Dept in CSE)

**Registration:** 4 Credits

**Class Meetings:** TTh 1:25-2:40, Room 121 Pillsbury

**Prerequisite:** ESCI 4602 or an equivalent Sedimentology course at another institution

For those taking the course S-N, an S will be considered equivalent to a C- or better; auditors are requested to officially register as a visitor. Grading scale utilizes +/- grades. The assignment of an *Incomplete* requires a **written** agreement between the instructor and student following university policy. Absences or late assignments require documentation of an excuse conforming to university policy. The expected workload is equivalent to three hours of learning effort per credit per week or 12 hours per week for this course.

**Instructor:** *Karen L. Kleinspehn*  
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624-0537 or 624-1333

Office hours: Thursday 11:00-1:00 or by appt.  
118 Pillsbury Hall

## Goals of this course

**Scientific goals:** This course focuses on an array of topics in Sedimentology, ranging from the micron to basin scales that reflect new developments in the geosciences as well as current issues relevant to global society. To the degree possible, the scientific content of the course is tailored to the research interests and professional goals of the student registrants.

**Writing component:** Effective writing is crucial to the dissemination of scientific thought. The most brilliant of scientific breakthroughs have little impact if they are not communicated successfully. A profound example lies with the birth of 'Modern Geology'. James Hutton presented the founding principles of our discipline in 1788, but in opaque prose. Only when his colleague, James Playfair, rephrased and republished those principles in 1802, did our science begin to flourish.

A primary goal of this course is to develop mature professional communication skills, especially writing as practiced in the geosciences. More importantly, effective communication is essential to function as a modern global citizen; thus this course focuses on vital lifelong skills regardless of one's career path. Writing skills are enhanced through abstract writing, short syntheses of lectures, analyses of published articles and a full-length research paper based on a thorough literature review coupled with your critical thinking.

**Lecture/Discussion Topics:** [BACKGROUND-READING SUGGESTIONS IN READING (1996)  
*Sedimentary Environments: Processes, Facies and Stratigraphy* IN PARENTHESES]

**Tue Sept. 3** – Introduction, writing expectations, **discuss examples of well/poorly written assignments**

**Thurs Sept. 5** – Sedimentary facies of modern and ancient systems: Alluvial-fan systems

(*Chapter 3*) **HAND OUT PUBLISHED PAPER TO REVIEW** (***ROHAIS ET AL., 2008***)

**Tue Sept. 10** – Sedimentary facies of modern and ancient systems: Fan-delta systems (*Chapter 6*)

**Thurs Sept. 12** – Allocyclic vs autocyclic controls on Fan-delta architecture

**REVIEW OF PUBLISHED PAPER IS DUE AT CLASS TIME**

- Tue Sept. 17 – Discussion of reviewed paper and scientific writing**  
*STATEMENT OF PAPER TOPIC & 5 REFS DUE AT CLASS TIME*
- Thurs Sept. 19 – Beach sedimentation in lakes and marine systems (Section 6.2 and 6.7-6.7.7)**  
*RETURN PAPER TOPICS WITH FEEDBACK)*
- Tue Sept. 24 – Nearshore deposits in the geologic record (p. 160-164, 210-216, 219-231)**  
*SUMMARY OF ALLUVIAL-FAN/FAN-DELTA LECTURES DUE AT CLASS TIME*
- Thurs Sept. 26 – Barrier islands and eustatic or lake-level changes** *RESUBMIT PAPER TOPICS*
- Tue Oct. 1 – Tsunamis & Storms: Nearshore sedimentation**  
*HAND OUT PUBLISHED PAPER TO REVIEW (FRIEND ET AL., 2012)*
- Thurs Oct. 3 – Tidal Sedimentation I (p. 164-166, 216-220)**  
*SUMMARY OF BEACH/BARRIER/Tsunami LECTURES DUE AT CLASS TIME*
- Tue Oct. 8 – Tidal Sedimentation II**  
*REVIEW OF PUBLISHED PAPER IS DUE AT CLASS TIME*
- Thurs Oct. 10 – Discussion of reviewed paper and scientific writing**  
*EXTENDED OUTLINE OF PAPER, DRAFT ABSTRACT & 10 REFS DUE AT CLASS TIME*
- Tue Oct. 15 – Geobiology of carbonate sediment**  
*SUMMARY OF TIDAL SEDIMENTATION LECTURES DUE AT CLASS TIME*  
*HAND OUT PUBLISHED PAPER TO REVIEW (BAYON ET AL. 2009)*
- Thurs Oct. 17– Subsurface sediment mobilization**  
*SUMMARY OF CARBONATE SEDIMENTATION LECTURE DUE AT CLASS TIME*  
*RETURN EXTENDED OUTLINE OF PAPER/DRAFT ABSTRACT WITH FEEDBACK)*
- Tue Oct. 22– Fluid escape: Pockmarks, mud volcanoes, pipes, hydrates**  
*RESUBMIT EXTENDED OUTLINE OF PAPER/DRAFT ABSTRACT*
- Thurs Oct. 24– Structural geology and geobiology of fluid expulsion**  
*REVIEW OF PUBLISHED PAPER IS DUE AT CLASS TIME*
- Tue Oct. 29 – NO CLASS -Research conference**
- Thurs Oct. 31 – Discussion of reviewed paper and scientific writing**  
*DRAFT OF ORIGINAL PAPER IS DUE AT CLASS TIME*
- Tue Nov. 5 – Volcanogenic sedimentation I**
- Thurs Nov. 7 – Volcanogenic sedimentation II (RETURN PAPER DRAFTS WITH FEEDBACK)**  
*SUMMARY OF FLUID-EXPULSION LECTURES DUE AT CLASS TIME*
- Tue Nov. 12 – Paleosols: Classification SEDIMENTATION LECTURES DUE AT CLASS TIME**
- Thurs Nov. 14 – Paleoclimatic signatures in sedimentary rocks: Paleosols (RESUBMIT PAPER DRAFTS)**
- Tue Nov. 19 – Paleosols, subsidence and fluvial architecture**

**Thur Nov. 21** – Sedimentary facies of modern and ancient systems: Anastomosed fluvial systems  
*ORIGINAL PAPER IS DUE AT CLASS TIME*

**Tue Nov. 26** – Anastomosed fluvial systems (p. 49-54) *(RETURN GRADED ORIGINAL PAPERS)*  
*SUMMARY OF PALEOSOLS LECTURES DUE AT CLASS TIME*

**Thur Nov. 28** – *NO CLASS – THANKSGIVING HOLIDAY*

**Tue Dec. 3** – *Oral Presentations of Papers*  
*SUMMARY OF ANASTOMOSED FLUVIAL LECTURES DUE AT CLASS TIME*

**Thur Dec. 5** – *Oral Presentations of Papers continued*

**Tue Dec. 10** – *Oral Presentations of Papers continued*

<b>Grading:</b> 3 published-paper reviews	30 % (70% writing, 30% scientific content)
8 Summaries of lectures	20 % (90% writing, 10% scientific content)
Original research paper	40 % ( 65% writing, 35% scientific content)
Oral presentation of original paper	10 %