

Fall 2007

Geos 643: Sandstone Depositional Environments

An advanced course treating the hydrodynamics, sediment dispersal patterns, and preservation potential of modern terrigenous clastic depositional environments and criteria for recognizing their ancient counterparts in the geologic record.

Instructor: Paul McCarthy, 336 NSB (474-6894; mccarthy@gi.alaska.edu)

Office hours: Mondays and Fridays 3:00 - 5:00 p.m. (or by appointment)

Texts: Reading, H.G. Sedimentary Environments: Processes, facies and stratigraphy (3rd edition), Blackwell Science Publ., Oxford, U.K. 706 p.

Scholle, P.A. and Spearing, D. Sandstone Depositional Environments. AAPG Memoir, 31, Tulsa, OK. 410 p.

Reineck, H.E. and Singh, I.B. Depositional Sedimentary Environments (2nd edition), Springer-Verlag, Berlin, 551 p.

This is a graduate level course in clastic depositional environments. The aims of this course are to provide you with technical training and theoretical background in clastic depositional environments beyond that which you may have obtained at the undergraduate level. From a practical point of view, the course will involve completion of a field-based research project, presentation of seminars and participation in discussions. We will be reading and discussing both text-book style material and research papers. I will present some of this material in traditional lecture style, however, students will also be expected to present much of the basic material in seminar format to their peers. Weekly discussion of pertinent research papers is important and, therefore, students are required to come to class prepared to discuss assigned papers.

Evaluation: Grades for the course will be based on a 10 -15 p. (excluding figures and tables) field-based research paper (40% first version; 20% second version), a constructive review of another student's research paper (10%), a seminar presentation on one (or more) of the listed topics (20%), and participation in weekly discussions (10%). I will provide further information on what is required for the research paper and review, and seminars in the next week.

Deadlines:

November 12 - First version of research paper due.

November 19 - Constructive review of papers due.

November 28 - First versions returned.

December 14 - Final version of research paper due.

Lecture/Seminar schedule:

Week of:

September 15/03 – Alluvial fan deposits

- Reading: p. 37-42; 57-61
- Scholle/Spearing: p. 49-86
- Reineck/Singh: p. 299-305.

September 22/03 – Fluvial deposits

- Reading: p. 37-54; 61-82
- Scholle/Spearing: p. 115-138
- Reineck/Singh: p. 257-298; 305-314.

September 29/03 – Paleosols

- Reading: p. 55-56
- Reineck/Singh: p. 298.

October 6/03 – Eolian deposits

- Reading: p. 125-153
- Scholle/Spearing: p. 11-48
- Reineck/Singh: p. 209-240

October 13/03 – Lacustrine deposits

- Reading: p. 83-124
- Scholle/Spearing: p. 87-114
- Reineck/Singh: p. 241-256

October 20/03 – Deltaic environments

- Reading: p. 156-160; 181-209
- Scholle/Spearing: p. 139-178
- Reineck/Singh: p. 321-338.

October 27/03 – Estuarine environments

- Reading: p. 216-218
- Scholle/Spearing: p. 179-190
- Reineck/Singh: p. 315-320.

November 3/03 – no classes

November 10/03 – Tidal depositional systems

- Reading: p. 154-166
- Scholle/Spearing: p. 191-246
- Reineck/Singh: p. 424-456.

November 17/03 – Shoreline and barrier island systems

- Reading: p. 154-231
- Scholle/Spearing: p. 247-280
- Reineck/Singh: p. 339-370.

November 24/03 – Shallow marine deposits

- Reading: p. 232-280
- Scholle/Spearing: p. 281-328
- Reineck/Singh: p. 371-381.

December 1/03 – Continental slopes

- Scholle/Spearing: p. 329-364

December 8/03 – Turbidites and submarine fans

- Reading: p. 395-453
- Scholle/Spearing: p. 365-404
- Reineck/Singh: p. 457-501.