Florida Atlantic University

Fall Semester 2011

GLY 4500C

SEDIMENTATION AND STRATIGRAPHY

Prerequisites: GLY 2010 Evolution of the Earth or equivalent Introductory geology course, GLY 2100 History of the Earth and Life or equivalent Historical geology course

Lectures: Tuesday and Thursday: 10:30 AM – 11:50 PM, Room PS 337

Labs: Wednesday: 1:00 – 2:50 PM, Room PS 355

Instructor: Dr. Anton Oleinik            Office: Physical Sciences Building, Rm. 358
Phone: (561) 297-3297            E-mail: aoleinik@fau.edu

Office hours: Tuesday & Thursday 5:00 – 6:30 PM and by appointment

Note: I will make every effort to be available during office hours. However, occasional conflicts, may force me to miss some office hours. Students may wish to call me prior to coming to the office, to ensure that I am in. I will also be available outside my regular office hours, please call or e-mail me and schedule an appointment.

Teaching Assistant: Michelle Chrpa

Office: PS 357


Course Description and Objectives:

- Overview of processes leading to formation of sediments and sedimentary rocks.
- Introduction to observation, classification, and various techniques of study of sediments and sedimentary rocks
- Interpretation of depositional environments, tectonic setting and provenance, and geologic history from macroscopic and microscopic examination of sedimentary samples.
- Examination of processes of sedimentation in the variety of marine, lacustrine and terrestrial depositional environments
- Review of methods and procedures of stratigraphy and approaches to interpretations of the sedimentary record.

Note: Some material that will be covered in the lecture is covered in the textbook insufficiently. Regular lecture attendance and taking notes are highly recommended for obtaining a good grade. Formal lectures will be augmented by slide presentations.
Exams and grading policy:
There will be two midterms and one final examination. Every exam (including final) is worth 30 points (without bonus questions). Exams may include identification of rock specimens in both hand samples and thin sections. Exam will typically consist of short answer questions of variable credit. Exams will typically include two to four bonus questions. There will be NO “make-up” exams unless arranged prior to the day of examination. Exams, including final, will not be comprehensive; covering only material dealt with immediately prior to each exam. Study guides will be provided prior to each exam. Laboratory exercises are due on the same day of the following week. Exceptions are labs # 3, 4, & 5. Labs 3 and 4 are designed for 2 lab periods each, Lab 5 is for 3 periods, due to the size of the assignment. Labs 3 and 4 will be due on the day, following second lab period, Lab 5 – due on the day following third lab period. The deadline for the last 2 labs (# 8 & 9) is December 6. No Exceptions! Each laboratory Exercise is worth 10 points if completed properly and submitted to the Teaching Assistant in time.

Total: 180 maximum possible points for the course (without bonus points): 3 exams @ 30 points each = 90 points, 9 labs @ 10 points each = 90 points.

Grading:
Approximate scale: A (>90%), B (89 – 80%), C (79 – 70%), D (below 70%), including +/-

CLASS POLICIES

ACADEMIC INTEGRITY:
Any incidence of cheating will result in a grade of "F" in the course and possible further disciplinary action. FAU has an Honor Code, and that infractions will have serious consequences.

CLASSROOM ETIQUETTE:
In order to enhance and maintain a productive atmosphere for education, personal communication devices such as pagers, beepers, and cellular telephones are to be disabled in class sessions. (University policy which applies to all classes - see FAU Academic policies http://www.fau.edu/academic/registrar/catalog/academics.php.) Any use of these devices during a quiz or examination will be considered to be cheating, and will be penalized accordingly.
Communication devices (cell phones, pages, laptop computers, etc.) must be turned off and out of reach during all lectures and examinations.

STUDENTS WITH DISABILITIES
Any student with a disability, whether hidden or visible, is urged to contact the Office for Students with Disabilities, then to bring paperwork from their office to the instructor at the beginning of the semester. They will verify the disability, and suggest accommodations which can be made to assist the student. All such accommodations will be made utilizing the best practical method.
Tentative class schedule

(Variations from this syllabus may (and probably will!) occur in order to better meet the needs of this particular group, this particular course, and this particular instructor. Any changes will be announced in class.)

I. FROM GRAINS TO STONE - SEDIMENTS AND SEDIMENTARY ROCKS

Section and page references to the Textbook are given to the Fourth Edition, 2006


August 31  Laboratory Exercise # 1 – Erosion and Sedimentary Particles

September 1  Conglomerates and Breccias.  (Textbook: Part III: 5.3: pp. 135 – 137).


September 7  Laboratory Exercise # 2 – Sieve Analysis of Sand and Statistical Parameters in Grain Size Analysis.

September 8  Provenance of siliciclastic sedimentary rocks. (Textbook: Part III; 5.2, p. 154)


September 14  Laboratory Exercise # 3 – Conglomerates and Sandstones
September 15  Clays and Shales – Classification and methods of study
(Textbook: Part III: 5.4; pp. 139 – 144).

**September 20 (Tuesday) Midterm Exam 1**

**September 21**  Laboratory Exercise # 3 – Conglomerates and Sandstones

**September 22**  Review of the Midterm Exam 1. Pyroclastic Rocks, Pelagic and fossiliferous sediments and resulting sedimentary rocks, deep ocean sediments. (PartIV: 10.3, p. 352-364)).

**September 27**  Carbonate sedimentary rocks: composition and classification of limestones.  (Textbook: Part III: 6.1 – 6.4: pp. 159 – 169)

**September 28**  Laboratory Exercise # 4 – Siltstones and shales


**October 5**  Laboratory Exercise # 4 – Siltstones and shales

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II. FROM THE MOUNTAINS TO THE SEA – REVIEW OF DEPOSITIONAL ENVIRONMENTS


**October 12**  Laboratory Exercise # 5 – Carbonate and Chemical Sedimentary rocks

**October 13**  Terrestrial Environments: Fire & Ice: Desert (Eolian), Glacial depositional environments. (Textbook: Part IV: 8.3, pp. 258 – 265; 8.5, pp. 276 – 286); Lake (Lacustrine) and Fluvial depositional


October 19  **Laboratory Exercise # 5** – Carbonate and Chemical Sedimentary rocks

October 20  Beaches and Barrier Islands. (Textbook: Part IV: 9.3, pp. 306 – 314)

October 25 (Tuesday)  **Midterm Exam 2**

October 26  **Laboratory Exercise # 5** – Carbonate and Chemical Sedimentary rocks


November 2  **Laboratory Exercise # 5** – Carbonate and Chemical Sedimentary rocks

III. TIME AND SEDIMENTS — METHODS AND PRINCIPLES OF STRATIGRAPHIC ANALYSIS

November 3  Episodic nature of stratigraphic record, gaps in stratigraphic record, facies concept. Stratigraphic procedures, types of stratigraphic units, stratigraphic code, lithostratigraphic units, correlation of lithostratigraphic units (Textbook: Part V: 12.1 – 12.6: pp. 399 – 424)

November 8  Subsurface information: stratigraphy from boreholes, types of well logs and well log interpretation. (Textbook: Part V: 12.6 pp. 427 – 432)

November 9  **Laboratory Exercise # 6**. Facies and Lithostratigraphy.


November 16  **Laboratory Exercise # 7.** Well log interpretation.


November 23  **Laboratory Exercise # 8.** Sequence Stratigraphy.


November 30  **Laboratory Exercise # 9.** Seismic stratigraphy.

December 6 (Tuesday)  10:30 AM – 1:00 PM  Final Exam