

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, ma.713207clik

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

## 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 23*      Origin, Classification, and Distribution of Sedimentary rocks.  
Weathering, Soils and Paleosols. (Textbook: Part I: 1.1, 1.2, 1.3,  
1.4: pp. 3-19).

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*

environments. (Textbook: Part IV: 8.2, pp. 245 – 250; 8.4: pp. 268 – 274).

*October 18* Transitional Environments: Deltaic, Tidal, Estuarine, and Lagoonal depositional environments. (Textbook: Part IV: 9.1, pp. 289 – 303; 9.6, pp. 326 – 331; 9.4, pp. 317-321; 9.5, pp.322-325).

*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

*October 27* Review of the Midterm Exam 2. Shallow Marine Environments: deposition on continental shelves. (Textbook: part IV: 10.2, pp. 335-347).

*November 1* Deep Sea Environments: Continental Slope, Oceanic (Pelagic) depositional environments(Textbook: Part IV: 10.3, pp. 349 – 352).

*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

- November 10* Geologic timekeepers – cyclic phenomena in stratigraphic record, cyclostratigraphy. Uniformitarianism and Catastrophism, event stratigraphy. (Textbook: Part V: 12.4 pp. 406 – 410)
- November 15* Sequence and seismic stratigraphy and sea-level fluctuations.(Textbook: Part V: 13.1 – 13.3: pp. 433 – 455).
- November 16 Laboratory Exercise # 7. Well log interpretation.
- November 17 Fossils, biogeography, and biostratigraphy – distribution of organisms in space and time. (Textbook: Part V: 14.1 - 14.7: pp. 478 – 509).
- November 22* Geochronology and Chronostratigraphy. Isotope stratigraphy and radiometric dating. Stable Isotopes and isotopic events and correlations. Calibrating the Geologic Time Scale by Absolute Ages: Radiochronology. (Textbook: Part V: 15.4, pp. 533 – 548).
- November 23 Laboratory Exercise # 8. Sequence Stratigraphy.
- November 29 Magnetostratigraphy. (Textbook: Part V: 13.4, pp. 462 – 469).
- November 30 Laboratory Exercise # 9. Seismic stratigraphy.
- December 6 (Tuesday) 10:30 AM – 1:00 PM Final Exam