

## STRATIGRAPHY (GLY 431) SPRING 2010

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- Instructor:** William B. Harris  
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- Class:** Lecture: Tuesday and Thursday, 8:00-9:15 am, DL-105  
Laboratory: Thursday 2:00-4:50 PM, DL-105.
- Office Hours:** M,W,F 9:00-11:00 am; M,W 2:00-3:30 pm; Thursday, 9:15-11:30 am; Other times by appointment
- Lecture Textbook:** Principles of Sedimentology and Stratigraphy by Sam Boggs, Jr., Prentice-Hall, Englewood Cliffs, NJ, 4<sup>th</sup> Edition, 2006, 662 p.
- Readings Notebook** A notebook with **Stratigraphy Readings** has been placed in the bookcase in DL 105 with a series of papers to be read during the semester. These readings are coordinated with the lecture schedule below. The notebook can not be removed from the lab. If you want to copy a paper, you may remove it, copy it but must replace the original immediately. Additional readings may be assigned during the semester. Some of the reading are in pdf format; they are indicated on the List of Readings.
- Laboratory Text:** **None required – Handouts are given with the exercises**

**Objectives:** Stratigraphy is senior level course and assumes that you have background in paleontology, petrology, historical geology and field methods. However, complete comprehension of stratigraphic principles and procedures requires knowledge of all areas of geology as well as some geophysics. The primary objective of GLY 431 is to familiarize you with the principle techniques and methods that are used by a stratigrapher in research, academia or industry. Techniques and methods of stratigraphy are varied and not all of them can be introduced in a semester long course. Therefore, this course will concentrate on those methods that have practical application to the study of layered rocks particularly as they apply to field-related problems. Specific objectives include introduction to methods of data collection, data analysis, and data interpretation. Data interpretation by necessity includes methods of data illustration and data representation. In order to illustrate this methodology, field-related geologic problems are used during the laboratory. You should find that stratigraphy draws upon all areas of geology you have studied and should force you to integrate what you have learned in other courses. Consequently, it is extremely important to be prepared for class. Read the assigned readings before each class and keep up with them during the semester.

**Attendance Policy:** All classes are important, thus class attendance is mandatory to ensure total awareness of each subject area. You will be allowed **THREE** excused cuts from lecture during the semester; for each unexcused absent I will deduct 2 points from your final grade. If you miss class because of an emergency, injury, sickness or other approved problem, I will gladly help you with the missed material. There are no unexcused absences permitted from the laboratory. If you miss laboratory, you better have a note from the *Jefe Grande (GOD)*.

**I start class promptly at 8:00 am; you should be here ready to take copious notes at the beginning of class. I am not happy with people who come to class late disrupting me and those who are deeply**

**involved in the process of learning. Remember, pay attention in class, ask questions and become engaged in the topic. If you plan on becoming a practicing geologist you will find that concepts learned in this class will enhance your ability to compete.**

**Academic Honor Code:** The University's Honor Code is enforced in this class and laboratory. If you are not familiar with the Code, complete details are in the current UNCW Code of Student Life. READ THE CODE.

**Violence and Harassment:** "UNCW practices a zero-tolerance policy for violence and harassment of any kind. For emergencies contact UNCW CARE at 962-2273, Campus Police at 962-3184, or Wilmington Police at 911. For University or community resources visit <http://uncw.edu/wrc/crisis.htm>."

**Student Behavior:** The University of North Carolina Wilmington Code of Student Life states that students who "Conduct himself/herself in a manner that significantly interferes with the teaching, learning or operations of the university" are disruptive and subject to disciplinary action. This includes the use of cell phones, text messaging, excessive talking, getting up and leaving the class during lecture. Turn off your phones; if one rings you will be asked to leave the class and prepare a written apology to be read to the class and me at the beginning of the following class period.

**Grades:** Three examinations will be given, including the final exam. Each examination will count 20% of your final grade as will the laboratory (20%). The other 20% will be determined from a final class presentation (10%) and class participation (10%). Examinations in this course reflect regurgitation of some facts given in lecture and the readings, and in application of the concepts presented in class. In addition, class examinations include the thoughtful integration of material presented in class with other areas of geology. Class examinations also include laboratory material. Remember to **THINK. There will be no makeup examinations or extra credit given in this class. If you miss an exam you will be assigned a grade of zero.**

**Grade Scale:** 100-93 = A, 92.9-90 = A-, 89.9-87.5 = B+, 87.4-82.5 = B, 82.4-80 = B-, 79.9-77.5 = C+, 77.4-72.5 = C, 72.4-70 = C-, 69.9-67.5 = D+, 67.4-62.5 = D, 62.4-60 = D-, <60 = F.

**Supplies:** You are not required to purchase any special supplies for this class; however, you will find it useful to have a field book, rock hammer, hand lens, and perhaps a pair of hiking boots for use on field trips, and a #1 Rapidograph, an engineers scale, an eraser, and a set of colored pencils for the lab. Drafting supplies, field books etc. can be purchased at McGhee Cadd Reprographics on 17th Street, and they usually give discounts (~15%) to UNCW students.

**E-Mail:** All UNCW students have university E-mail accounts and the accounts are the official means of communication in this class. Class information will be shared with you through this account. I would like each of you to E-mail me greetings by Thursday, January 15. Your e-mail must come from your university account; I will not respond to outside e-mail accounts.

**Paper:** Each student will prepare a presentation on some aspect of either spatial or temporal stratigraphy that I approve. The 10 minute presentation will be presented to the entire class during the last laboratory period. A suggested outline will be distributed at a later date to help with organization of the presentation and the various due dates various components that I must review. Remember to start your preparation early.

## TENTATIVE SCHEDULE

Date	Topic	Reading* (Textbook is indicated)
Jan. 7	Introduction, Course Organization, Philosophy	Reading <sup>1</sup> , Schoch, p. 1-7, 21-26 Reading <sup>2</sup> , Chamberlin, p. 754-759
Jan. 12	The Stratigraphic Database - Field Study, Equipment, and Basic procedures at Outcrops	Reading <sup>3</sup> , Compton, p 1- 47
Jan. 14	Physical Properties of Sedimentary Rocks	Boggs, p. 49-116
Jan. 19	Physical Properties of Sedimentary Rocks	Boggs, p. 49-116
Jan. 21	The Stratigraphic Database – Subsurface Study	Reading <sup>4</sup> , Baars, p. 1-3
Jan. 26	Subsurface Data Types - Cores, Chips	Reading <sup>5</sup> , Miall, p. 67-74
Jan. 28	Subsurface Data Types - Petrophysical Logs	Reading <sup>6</sup> , Doverton, p. 3-61
Feb. 2	Subsurface Data Types - Petrophysical Logs cont.	Reading <sup>6</sup> , Doverton, p. 3-61
Feb. 4	Seismic Data Gathering Techniques	Reading <sup>7</sup> , Bayli et al., 70 p.
<b>Feb. 9</b>	<b>FIRST EXAM</b>	
Feb. 11	Seismic Stratigraphy	Boggs, p. 433-451 Reading <sup>8</sup> , Emery & Myers, p. 45-51
Feb. 16	Sequence Boundaries, Characteristics and Significance	Reading <sup>9</sup> , Vail et al., p. 99-116
Feb. 18	Principles of Sequence Stratigraphy, An Overview The Basic Model	Reading <sup>10</sup> , Catuneanu p. 1-15 Reading <sup>11</sup> , Miall, p. 58-69 Boggs, p. 451-462
Feb. 23	Intrasequence Surfaces and Systems Tracts, Characteristics	Reading <sup>12</sup> , Loutit et al., p. 183-213
Feb. 25	Clastic Facies and Depositional Sequences  Carbonate Facies and Depositional Sequences	Reading <sup>13</sup> , Posamentier et al., p. 109-154 Reading <sup>14</sup> , Sarg, p. 155-181
Mar. 2	Changing Sea-Levels, Global Cycles	Reading <sup>15</sup> , Haq et al., p. 1156-1167 Reading <sup>16</sup> , Technical Comments, p.596-602

Mar. 4	<b>SECOND EXAM</b>	
<b>March 8-12</b>	<b>Spring Break</b>	
Mar. 16	Introduction to the North American Stratigraphic Code and the International Stratigraphic Guide  Lithostratigraphic and Lithodemic Units	Boggs, p. 588-596, Stop at Part II, Articles Reading <sup>17</sup> , Salvador, (p. 1-11) Boggs, p. 399-421 Boggs, p. 600-605
Mar. 18	Lithostratigraphic and Lithodemic Units cont.  Lithostratigraphic Correlation	Boggs, p. 399-421 Boggs, p. 600-605 Boggs, p. 421-432
Mar. 23	Biostratigraphy and Biostratigraphic Units	Boggs, p. 478-501 Boggs, p. 605-606
Mar. 25	Biostratigraphic Correlation	Boggs, p. 502-512 Reading <sup>18</sup> , Zeller, p. 631-636
<b>April 1</b>	<b>Easter Break</b>	
Apr. 6	Magnetostratigraphy	Boggs, p. 462-477 Boggs, p. 605
Apr. 8	Chronostratigraphy	Boggs, p. 513-538 Boggs, p. 609-613
Apr.13	Radiometric Dating	Reading <sup>19</sup> , Schoch, p. 258-279
Apr. 15	Geologic Time Scales	Reserve <sup>20</sup> , Gradstein et al., p. 3-46
Apr. 20	Chemical Stratigraphy	Reserve <sup>21</sup> , Elderfield, p. 71-90 Reserve <sup>22</sup> , McArthur, p. 331-358
Apr. 22	Putting it All Together to Understand Basin History	

**FINAL EXAM: Tuesday, April 29, 8:00 AM-11:00 AM, DL-105**