

SUNY Cortland
Department of Geology
GLY 359 – Sedimentary Geology
Spring, 2018

Credit Hours: 4	Instructor: Dr. Christopher A. McRoberts
Lecture: Bowers 1011, Tu, Th 10:05-11:20	Office: 1010 Bowers Hall
Lab: Bowers 336, Th 11:40-2:30	Phone: 753-2925
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	Office Hours: TU: 2-4, WE: 2-5

The sediments are a sort of epic poem of the Earth. When we are wise enough perhaps we can read in them all of past history

—Rachel Carson, 1951

Catalog Description

Geology of sedimentary rocks, sedimentary processes, and stratigraphic principles including sedimentary petrology, depositional processes, facies analyses and stratigraphic relationships at various temporal and spatial scales. Required laboratory and field trips.

The purpose of this course is for students to gain an understanding of sedimentary rocks, the processes of sedimentation, the environments in which sediments are deposited and regional spatial and temporal distribution of sedimentary rocks and their correlation. The student by the end of the course (i) is, using a variety of techniques, able to recognize and describe the physical properties of common sedimentary rocks and sedimentary structures in hand samples and in thin section; (ii) becomes knowledgeable in the basic principles governing sedimentological processes in modern environments, and (iii) is able integrate observations from sedimentary rocks and stratigraphic sequences and formulate interpretations of ancient depositional environment(s).

It is assumed that students have also completed the prerequisite courses: Historical Geology (GLY 262) and Mineralogy (GLY 301).

Required Materials

Required Text: Nichols, G. 2009. *Sedimentology & Stratigraphy*, 2nd ed. Wiley-Backwell. 419 p.

Additional required readings will be kept on reserve in the Library or available online. You will also be **required** to obtain a hand lens (10x is sufficient) for examination of hand samples and a rock hammer for use in the field.

Attendance Policy

You are expected to attend all lectures and laboratories; however, attendance *per se* will not be part of your grade assessment. Each student, however, will be responsible for material missed and any assignments due on the day of an absence. Unless otherwise excused (see below) make-up quizzes and exams will not be allowed. Excused absences include your illness, a death or other family emergency.

A Writing Intensive Course

This course is a writing intensive (WI) course. The WI component will be comprised of a series of written reviews of peer-reviewed scientific articles. These reviews will be critiqued, assessed and returned thus providing students an opportunity to refine and revise their work. Guidelines for writing the reviews and an assessment rubric will be provided. Following the return of the critiqued/assessed initial literature review, students will have approximately one week to resubmit their review addressing the writing and comprehension concerns identified in my critique. This second submission will be critiqued and assessed using the same rubric as the initial submission with the new score replacing that of the initial submission.

Field Trips:

In addition to weekly field trips during the laboratory which are part of the course project correlating and analyzing carbonate rocks, there is a required all-day field trip to NY's Southern Tier to examine clastic sedimentary rocks in a broad transect from marine to non-marine settings. The all-day trip is usually scheduled for a Saturday in the 2nd or 3rd week of April. The all-day field trip is required. Failure to attend the field trip will result in an incomplete (INC) grade for the course.

Grading:

Your grade will be based upon your performance in laboratory and quizzes, a field project with research paper, writing assignments, the two one-hour exams and a final exam- each with laboratory component. The breakdown of your grade is as follows:

Laboratories and quizzes	10 %
Article reviews and writing assignments	15 %
Field Project	10 %
First Hour Exam	20 %
Second Hour Exam	20 %
Final exam:	25 %
TOTAL	<u>100 %</u>

Academic Integrity Statement:

Students will not cheat or plagiarize in this course. Plagiarism, a serious academic offense, is defined as expropriating the ideas of others and using them as one's own without due credit. Students who cheat in examinations or plagiarize in this course will be disciplined in accordance with university rules and regulations. (See College Handbook, Chapter 340.)

Students with Disabilities:

SUNY Cortland is committed to upholding and maintaining all aspects of the federal Americans with Disabilities Act of 1990 (ADA) and Section 504 of the Rehabilitation Act of 1973. If you are a student with a disability and wish to request accommodations, please contact the Student Disability Services Office located in B-1, Van Hoesen Hall or call 753-2066 for an appointment. Because many accommodations require early planning, requests for accommodations should be made as soon as possible.

COURSE OUTLINE

GLY 359 Sedimentary Geology

Spring, 2018

Lecture Topic	Reading
PART I: SEDIMENTS AND SEDIMENTARY ROCKS	
Introduction to sedimentology and stratigraphy	Chap. 1
Sedimentary Petrology I: Clastic (terrigenous) sedimentary rocks	
Constituent components and mineralogy of sedimentary rocks	Chap. 2
Physical properties of sedimentary rocks: texture, etc.....	Chap. 2
Classification of clastic rocks	Chap. 2
Sedimentary Petrology II: Biogenic and chemical sedimentary Rocks	
Constituent components and mineralogy of biogenic and chemical rocks	
Limestones and dolostones	Chap. 3
Cherts, phosphates, and organic deposits	Chap. 3
Evaporites and other chemical rocks	Chaps. 3
PART II: PROCESS OF DEPOSITION AND SEDIMENTARY STRUCTURES	
Transporting particles and fluvial dynamics.....	Chap.: 4
Sedimentary structures	Chap.: 4
PART III: DEPOSITIONAL MODELS	
Sedimentary processes and facies analysis	Chap. 5
Weathering and origin of sediments	Chap. 6
Terrestrial environments: alluvial, fluvial, lacustrine, and eolian	Chap. 7-10
Near-shore and deltaic environments.....	Chaps. 11-13
Marine and pelagic environments	Chaps. 14-16
PART IV: SED ROCKS AND STRATIGRAPHIC PRINCIPLES	
Burial diagenesis and lithification	Chap. 18
Stratigraphic principles.....	Chap. 19
Biostratigraphy and geologic time	Chap. 20, 21
Seismic and sequence stratigraphy	Chap. 22, 23
Basin analysis and environments through time	Chap. 24