

Geology 335 Sect. 1 Syllabus; Fall, 2016

GEOL335 Section 1	Fall, 2016	Fundamentals of Geochemistry
Dr. Scott Werts		Office: Sims 212A
Course Classroom: Sims 201		Meeting Time: MW 9:30–10:45
Email: wertss@winthrop.edu		Office Hours: TTh 9:30-11 or by appointment
Text: <i>Biogeochemistry, an Analysis of Global Change, 3rd Edition</i> Schlesinger and Bernhardt		Office Phone: 323-4930

Prerequisite: General Chemistry II (CHEM 106)

Course Goals and Objectives: This course is designed to investigate the reactions controlling the geochemistry of Earth materials. We will investigate the chemical reactions involved with both the Earth's interior and on the surface.

Course Attendance: Attendance at lecture is both necessary and mandatory. There will be course material covered in lecture that goes beyond the assigned readings and that material will be considered testable. If you are unable to attend class on a particular day, please provide me the common courtesy of informing me prior to your absence and have a plan as to how to make up the work you missed. Persistent failure to attend class will be taken into account when calculating your final grade.

Course Preparation: You are responsible for assigned readings in this course prior to the associated lecture. The information contained in these readings is pertinent to the course and is considered testable material. If you do not understand something from the readings, please ask. There is no such thing as a "dumb question" in this course and I will try in earnest to answer every question asked.

Course Grading: Your grade for this course will be based on the following distribution of work:

3 Mid-Term Exams	50 pts. each	150 pts.
1 Final Exam	100 pts.	100 pts.
10 Homework Assignments	10 pts. each	100 pts.
1 Semester Paper	100 pts.	100 pts.
Total		350 pts.

The semester paper will be discussed in greater detail during class time. It will involve a great deal of library work and research on your own time. The due date will be announced midway through the course, but you will be provided everything you need to get started within the first several weeks of class time.

Homework assignments will include reading journal articles and answering questions regarding geochemical concepts in paragraph form, graphing

geochemical data and solving geochemical problem sets quantitatively. Assignments will be due by the end of the day on the Tuesday after they are assigned unless otherwise stated. Some of the assignments will be turned in electronically on Turnitin.com. The Class ID for this section is **13257732**. The password will be given to you during class time. There is a late penalty of 2 points per day for each day the assignment is late.

All assignments for this course are expected to be completed and turned in at the posted due date. Any late assignments will decay at an exponential rate of one half-life per 2 days.

The dates for the exams are included below. There will be no make-up exams or quizzes without prior arrangement from the instructor *and/or* documentation of an emergency that necessitates the student missing class. If you are in danger of missing class, it is best if you notify me by email or phone message as soon as possible.

Exams will be in the form of short essay questions regarding geochemical concepts presented in this course. You will have several essay question options presented to you on the exam from which a subset will be chosen by you to answer. The final exam in this course will be cumulative.

Grades for the course will be determined based on the following grading scale:

A	90 - 100%
B	80 - 89%
C	70 - 79%
D	60 - 69%
F	< 59%

A grading curve may be applied at the instructor's discretion, but the point value required for a particular grade will never be more than indicated above. A total of 315 points earned for the course will always equal an A.

Statement on Cheating: Your grade in this course will be based solely on your work alone. Any attempt to copy another student's answers during tests or quizzes or any use of unauthorized materials (cheat sheets/information stored on calculators/etc.) during test and quiz time is strictly forbidden and could result in an "F" for the entire course in conjunction with other unpleasant administrative actions. Unethical behavior with regard to course material will not be tolerated.

Students with Disabilities: Winthrop University is committed to providing access to education. If you have a condition which may adversely impact your ability to access academics and/or campus life, and you require specific accommodations to complete this course, contact the Office of Accessibility (OA) at 803-323-3290, or, accessibility@winthrop.edu. Please inform me as early as possible, once you have your official notice of accommodations from the Office of Accessibility.

Course Schedule (Tentative):

Day	Date	Lecture	Reading; Notes
Wednesday	24-Aug	Meteorites and Origins of Planets	Albarède Chapter 12, p. 248-272 Schlesinger Chapter 2, p. 16-23
Monday	29-Aug	Origins of Planets and Chemical Differentiation of the Earth	Albarède Chapter 2, p. 23-40 Mineral Evolution – Remainder of Introduction
Wednesday	31-Aug	Differentiation of the Earth Continued	
Monday	5-Sep	Mineralogy and crystal structures	Handout
Wednesday	7-Sep	Crystal Structures (continued)	Handout Mineral Evolution – Discussion through conclusion
Monday	12-Sep	Igneous Rock Classifications	Handout
Wednesday	14-Sep	<i>Exam #1</i>	
Monday	19-Sep	The Mantle/Core and intro to Age Dating	Albarède Chapter 8, p. 218-225 Albarède Chapter 9, p. 71-94
Wednesday	21-Sep	Radiometric Dating	
Monday	26-Sep	Chemical Weathering Processes	Schlesinger Chapter 4, p. 90-100
Wednesday	28-Sep	Chemistry of Natural Waters	Schlesinger Chapter 8, p. 261-280
Monday	3-Oct	Intro to Biogeochemical Cycles	Schlesinger Chapter 1, p. 3-13
Wednesday	5-Oct	Introduction to Stable Isotopes	Albarède Chapter 3, p. 45-61 Handout
Monday	10-Oct	Oxygen-18 and Dueterium	Handout
Wednesday	12-Oct	<i>Exam #2</i>	
Monday	17-Oct	Carbon-13	Handout
Wednesday	19-Oct	Carbon Cycle (Terrestrial)	Schlesinger Chapter 5, p. 127-164
Monday	24-Oct	Global Carbon Cycle	Schlesinger Chapter 11, p. 358-382
Wednesday	26-Oct	Nitrogen and Phosphorous Cycles (Terrestrial)	Schlesinger Chapter 6, p. 166-223
Monday	31-Oct	Nitrogen and Phosphorous Cycles (Aqueous)	Schlesinger Chapter 7, p. 249-251, 254-257
Wednesday	2-Nov	Nitrogen and Phosphorous Cycles (Aqueous)	Schlesinger Chapter 9, p. 301-307, 316-328
Monday	7-Nov	<i>Exam #3</i>	
Wednesday	9-Nov	Surface Water Chemistry	Handout
Monday	14-Nov	Surface Water Chemistry continued	
Wednesday	16-Nov	Wetlands	Handout
Monday	21-Nov	Paleoclimatology	Albarède Chapter 9, p. 184-200 Handout
Wednesday	23-Nov	<i>No Class - Thanksgiving Break</i>	
Monday	28-Nov	Paleoclimatology (Part 2)	
Wednesday	30-Nov	Interesting geochemistry related subjects	
Monday	5-Dec	Interesting geochemistry related subjects	
Monday	12-Dec	Final Exam – 8 am	