

Geology 225 Sect.1 Syllabus; Spring, 2018

GEOL225 Section 1 (3 credits)	Spring, 2018	Soils and Land Use
Dr. Scott Werts		Office: Sims 212A
Course Classroom: Sims 201		Meeting Time: MW 12:30-1:45
Email: <a href="mailto:wertss@winthrop.edu">wertss@winthrop.edu</a>		Office Hours: TR 9:30-11 or by appointment
Text: Brady and Weil, 2008. Elements of the Nature and Properties of Soils, 3 <sup>rd</sup> Edition		Office Phone: 323-4930

**Course Goals and Objectives:** Soils represent arguably the most critical place in regards to survival of terrestrial ecosystems. They provide the foundation for nearly every physical, chemical and biological development seen on land. Soils are our most important natural resources and are key to environmental sustainability and any human use of the land.

This course will provide a basis for understanding the fundamental properties of soil. We will investigate the natural factors that influence soil formation and how the soils themselves influence the landscape as a whole.

This course will fulfill the following educational goals and learning outcomes.

*Because soil is one of the main interfaces between the organic and inorganic Earth, students will learn to identify rocks, minerals, tree species and other vegetation. Students will also learn the basics of soil chemistry and physics through lecture, laboratory and field exercises.*

*Portions of this course will be spent in laboratory and field based inquiries where students will gain the ability to both accurately describe and measure soil properties and write brief scientific reports regarding their findings at each field site.*

*Students will learn the strength and weaknesses of various soil methods, including particle size, cation exchange capacity and pH assessments both in lecture and laboratory experiments. Students will also gain significant experience using the USDA soil survey maps and data and learn the importance of ground-truthing this data.*

*Students will write both laboratory assignments and field reports in which they will accurately describe all soil properties and name the soil through the use of standard USDA taxonomic standards. All descriptions of soils and field sites must be defended by the collection and analyzation of collected data. Students will also complete a Land Use Project in which they must provide recommendations for future land use of a parcel of land based on soil properties and suitability.*

*This course will also include discussions and activities based on land use issues as related to soil properties across the landscape. This will include both modern concerns (construction and agricultural issues) as well as historical land use.*

**Global Learning Initiative:** The GLI components of this course include studies of the following: (1) causes of flooding, drought effects on soil and the issues surrounding poor use land choice and development. All of this affects economic and society in many ways, which will be explored; (2) causes and implications of global climate change.

**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.

**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.

Soil science is a very “visual” and “hands on” subject and many students view diagrams, drawings and pictures as a useful supplement to the readings and discussions in this course. I post all images used in my lectures on the course website prior to my lectures. You are welcome to print these prior to class if you wish and take notes along side them or view them online when studying after class time.

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

<b>3 Midterm Exams</b>	<b>50 Pts. Each</b>	<b>150 Pts.</b>
<b>1 Final Exam</b>	<b>50 Pts.</b>	<b>50 Pts.</b>
<b>5 Homework Assignments</b>	<b>10 Pts. Each</b>	<b>50 Pts.</b>
<b>1 Field Trip Report</b>	<b>20 Pts.</b>	<b>20 Pts</b>
<b>Land Use Project</b>	<b>100 Pts</b>	<b>100 Pts.</b>
<b>Total</b>		<b>370 Pts.</b>

Homework assignments will be distributed at various intervals throughout the semester. They are designed to reinforce lecture and reading material. At times, assignments will be based on classroom activities, so attendance to lecture times is paramount to success for these assignments. Assignments will always be due during the beginning of class on the Tuesday after they are assigned. There is a late penalty of 2 points per day for each day the assignment is late. Some of the assignments will be turned in on Turnitin.com, a website designed for online grading and plagiarism analysis. The turnitin class ID for this course is **14334703**.

There is one mandatory field trip in this course in which students will practice their soil identification skills in the field. This field trip will be available on two days, but students are only expected to attend one of the trips. **Tentative dates for these trips are March 4<sup>th</sup> and March 25<sup>st</sup>**. A homework assignment will be due based on this field trip. If you have a conflict with attending this trip, please see your professor.

The dates for the exams are included below. There will be no make-up exams or assignments 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 format of multiple choice and short answer questions. The final exam will be cumulative and will reflect both the course material discussed since Exam #3 and material from previous exams. Details of this exam format will be provided for you in class.

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

A	< 89%
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 more than 89% of possible points earned for the course will always equal an A.

Opportunities for extra credit may be offered at the instructor's discretion. If an extra credit assignment becomes available, further details and instructions will be provided.

**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, quizzes or homework 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. Answers to questions from homework assignments should reflect your work, not sentences copied from books, websites or from other students. Unethical behavior with regard to course material will not be tolerated.

**Students with Disabilities:** Winthrop University is dedicated to providing equal access to education for all students. If you have a disability and need classroom or testing accommodations, please contact Gena Smith, Coordinator, Services for Students with Disabilities, at 323-3290 as soon as possible. Once you have your professor notification, please tell me immediately so that I am aware of your accommodations.

*Tentative Course Schedule. Topics and reading assignments may be subject to change at the instructor's discretion. Any changes will be announced during class time.*

Day	Date	Lecture Topic	Assigned Reading
Tuesday	9-Jan	Course Introduction – What is Soil?	Chpt. 1 pgs. 1-25
Thursday	11-Jan	Intro to Rocks and Sediments	Handouts
Tuesday	16-Jan	Soil Formation and Weathering (Part 1)	Chpt. 2 pgs. 27-43
Thursday	18-Jan	Soil Formation and Weathering (Part 2)	Chpt. 2 pgs. 43-57
Tuesday	23-Jan	<i>NCSE Conference----No Class</i>	
Thursday	25-Jan	<i>NCSE Conference----No Class</i>	
Tuesday	30-Jan	Soil Classification and Taxonomy	Chpt. 3 pgs. 58-94
Thursday	1-Feb	Soil Classification (Soil Survey and intro to Land Development Project)	
Tuesday	6-Feb	More Soil Classification	
Thursday	8-Feb	Soil Physical Properties	Chpt. 4 pgs 98-131
Tuesday	13-Feb	<b>Exam #1</b>	
Thursday	15-Feb	Movement of Water in Soils	Chpt. 5 pgs. 152-163
Tuesday	20-Feb	Movements of Water (Part 2)	
Thursday	22-Feb	Soil and the Hydrologic Cycle	Chpt. 6 pgs. 165-198
Tuesday	27-Feb	Soil Aeration and Temperature	Chpt. 7 pgs. 201-232
Thursday	1-Mar	Cation Exchange Capacity	Chpt. 8 pgs. 235-287
Tuesday	6-Mar	Soil Colliods and Cation Exchange cont.	
Thursday	8-Mar	<b>Exam #2</b>	
Tuesday	13-Mar	<i>Spring Break – No Class</i>	
Thursday	15-Mar	<i>Spring Break – No Class</i>	
Tuesday	20-Mar	Soil pH and Acidity	
Thursday	22-Mar	Soil Ecology (Part 1)	Chpt. 10 pgs. 322-358
Tuesday	27-Mar	Soil Ecology (Part 2)	
Thursday	29-Mar	Soil Organic Matter and the Carbon Cycle	Chpt. 11 pgs. 361-394
Tuesday	3-Apr	<b>Exam #3</b>	
Thursday	5-Apr	Nitrogen and Sulfur in Soils	Chpt. 12 pgs. 396-420
Tuesday	10-Apr	Phosphorous and Other Soil Nutrients	Chpt. 12 pgs. 420-452
Thursday	12-Apr	Soil Fertility and Nutrient Management	Chpt. 13 pgs. 455-496
Tuesday	17-Apr	Soil Erosion (Part 1)	Chpt. 14 pgs. 499-553
Thursday	19-Apr	Final Exam	
Thursday	26-Apr	<b>Group Presentation Day – 11:30 -am</b>	