

OEAS 408/508
INTRODUCTORY SOILS

FALL 2009

3 hours lecture, 2 hours lab, 4 credits

Lecture: 1:00-2:15 M; 1:30-2:45 PM T; OCNPS Rm 203; Lab: 12:00-3:00 PM W; OCNPS Rm 309

Course page website: <http://www.odu.edu/~jrule>

Textbook website: http://wps.prenhall.com/chet_brady_natureandp_14/

INSTRUCTOR: Dr. Joseph H. Rule, Professor Emeritus
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Office Hours: By appointment

LABORATORY INSTRUCTOR: Dr. Rule

TEXT: The Nature and Properties of Soils, N.C. Brady & R.R. Weil, 14th Edition, Revised.

EXAMINATIONS: Three one-hour lecture exams and final exam with possible periodic survey quizzes.

	408	508		408	508
GRADING:	<u>Exam/Item</u>	<u>% grade</u>	<u>Exam/Item</u>	<u>% grade</u>	<u>% grade</u>
	Exam 1	17	Final	24	22
	Exam 2	17	Lab book	15	13
	Exam 3	17	Lab Final	10	10
			Project/Paper	--	10

NOTE: All exams are listed in the Lecture and Lab schedules. There are no make-up exams.

CLASS CONDUCT: Students are expected to attend all classes and be in their seats at the beginning of the class period. Please do not wear hats or other distracting clothing during class; turn off cell phones and pagers. Respect your fellow students by not talking during the lecture. If you do not understand the instructor, please ask the instructor for clarification, not one of your classmates.

EXAM FORMAT: Exams will consist of short answer essay questions. Study questions are in the text at the end of each chapter and additional questions are supplied on the class web site. These questions should be used as an aid in your study of the course material. A significant portion of each exam will consist of questions from these two sources. Since a major emphasis of Geology 408 is a writing component, the writing skills of the student will be evaluated in exam grading.

FIELD TRIP: At least one off-campus Saturday field trip will be arranged.

COURSE OBJECTIVE: Students, in various fields of interest, will be introduced to the concepts, constituents, and physical and chemical properties of soils. Major soil types and their classification will be addressed. Soil uses, misuses, and limitations based on their various properties and the impact of their uses and interaction with the rest of the environment will be discussed.

LAB MANUAL: Laboratory Manual for Introductory Soil Science by R.R. Weil, 8rd edition.

LABORATORY: The laboratory notebook (answer sheets, lab notes, Handout material) must be maintained in a legible and orderly condition. An outline with objectives completed for each laboratory exercise is due at beginning of each laboratory period and is worth 10 points for each lab. The experimental results and answers to questions will account for 15% of the course grade. The laboratory final exam will account for 10% of the grade. Students are expected to develop sufficient computer skills to utilize a word processor and spreadsheet program to prepare their lab report.

GEOLOGY 508: Those students enrolling for graduate credit are required to complete additional assignments as well as maintain greater academic performance than 408 students. Additional assignments will consist of library or laboratory projects selected by the student and approved by the instructor and will account for 10% of the final grade.

WRITTEN PAPER: This will be a concise written paper on a subject appropriate to the class material. The paper should be a short (5-7 typed pages) report on a subject pertaining to the theme of the course. The topic and brief outline should be approved by the instructor prior to the writing of the manuscript (by the fourth week of classes). There should be an abstract, introduction, discussion, summary and conclusions and literature cited sections. You should include your own opinions where appropriate, especially in the summary. Make sure that the source of the information is clear to the reader, throughout the manuscript. **Please use an article from the Reviews section of the Journal of Environmental Quality as your style reference.** The written report is due to the instructor by the last day of classes. It is the responsibility of each student to meet these deadlines.

NOTE: Geology 408 students may choose to complete a library or laboratory project and will be graded in accordance with the 508 grading scheme. This choice must be made prior to Exam 1. Once the choice is made by a 408 student to undertake the research project, they **cannot** return to the original grading scheme.

LECTURE SCHEDULE: M: 1:00-2:15; T: 1:30-2:45

DATE	CHAPTER	READING ASSIGNMENT/CHAPTER TITLES
Aug 31, Sept 1	1	(1) The Soils Around Us
Sept 7, 8	2	(2) Formation of Soils From Parent Material
Sept 14, 15, 21	3	(3) Soil Classification
Sept 21	4	(4) Soil Architecture & Physical Properties/Review
SEPT 22	-- EXAM 1, TUESDAY, SEPT 22: CHS 1, 2, 3 --	
Sept 28	4	Chap 4, continued
Sept 29, Oct 5	5	(5) Soil Water: Characteristics & Behavior
Oct 6	6	(6) Soil & the Hydrologic Cycle
Oct 12, 13	FALL BREAK – NO CLASS	
Oct 19	7	(7) Soil Aeration & Temperature/WETLAND (HYDRIC) SOILS [handout]
Oct 20	8	(8) Soil Colloids: Their Nature & Significance/Review
OCT 26	-- EXAM 2, MONDAY, OCT 26: CHAPS 4,5,6,7--	
Oct 27	8	Chap 8, continued
Nov 2	9	(9) Soil Acidity
Nov 3, 4	11	(11) Organisms & Ecology of the Soil
Nov 10, 16	12	- (12) Soil Organic Matter
Nov 17	15	(15) Micronutrients & Other Trace Elements
NOV 23	-- EXAM 3, MONDAY, NOVEMBER 23: CHAPS 8, 9, 11, 12, 15 --	
NOV 25, 29	THANKSGIVING HOLIDAY – NO CLASS	
Nov 30	16	(16) Practical Nutrient Management/Review
Dec 1	17	(17) Soil Erosion and Its Control (18) Soils and Chemical Pollution
Dec 7	18	Chap 18, continued
Dec 8	20	(20) Global Soil Quality as Affected by Human Activities

CLASSES END: December 11, 2009

FINAL EXAM: TUESDAY, DECEMBER ??, 2009 – 12:30 – 3:30 PM

**All chapters covered; 40% of exam on CHAPS 16 17, 18, 20
All Exams Must Be Taken At Scheduled Times - There Will Be No Make-Up Exams**

LABORATORY SCHEDULE

WEDNESDAY, 12:00 - 3:00 PM Room OCNPS 309

Required Manual: Laboratory Manual for Introductory Soil Science by R.R. Weil, 8rd edition.

PLEASE NOTE: Prior to the lab period, each student should review the exercise and prepare a short statement of the objective(s) and outline of the exercise. This one-fourth to one-third page outline must be completed and presented to the instructor **prior to starting** the lab; it is worth 10 points for each lab.

Data and question sheets are provided in the lab manual. Please turn in a photocopy and leave the original in your manual; penmanship and copies must be legible. **Clearly label the top sheet with the Exercise No., Lab day and your name.**

Results of each week's work are due the following lab period unless specifically noted!

<u>WEEK</u>	<u>DATE</u>	<u>LABORATORY EXERCISE</u>
1	Sept 2	Lab Check-In and Intro to Analytical Techniques [Handout]; Appendix, Lab Manual; Significant Figures [Handout]
2	Sept 9	No. 1 Minerals, Rocks and Parent Materials (and Handout)
3	Sept 16	No. 5 Use of Soil Survey Reports in Land Use Planning
4	Sept 23	No. 3 Soil Texture: Mechanical analysis
5	Sept 30	No. 4 Field Skills: Texture "By Feel" and Color Charts
6	Oct 7	No. 6 Soil Density, Porosity and Structural Stability
7	Oct 14	No. 8 Effect of Soil Composition on Percolation and Retention of Water
8	Oct 21	No. 7 Investigating Soil Capillary Rise
9	Oct 28	No Supplement - Water Movement in Soil [Exciting Film!]
10	Nov 4	No. 11 Soil Organic Matter
11	Nov 11	No. 15 Cation Exchange Properties of Soils
12	Nov 18	No. 16 Soil Acidity (pH)
13	Nov 25	NO LAB – THANKSGIVING HOLIDAY
14	Dec 2	No. 18 Test for Available Phosphorus in Soil
15	DECEMBER 9 -	LABORATORY EXAM ROOM OCNPS 309

**NOTE: THE FOLLOWING FIELD TRIP IS REQUIRED!
DATE AND LOCATION TO BE DETERMINED
[Exercise 20: Soils in the Field]**