

Course Introduction: This is a junior level course designed as an introduction to soil science and hydrology; it will hopefully provide you with sufficient basic information to serve as a sole course in these topics, or form an introduction for later courses in soil science and/or hydrology. The subject matter is oriented towards students majoring in environmental sciences and ag or forestry management related fields. The lecture and laboratory will be complimentary in presenting information of both a theoretical and practical nature. Prerequisites for the course include college algebra and CHEM 1211/L.

Course Objectives: The overall objective of the course is to give students a basic background in soil science and hydrology, including key concepts in these fields such as:

- > how to describe and interpret landscape and soil profile information in the field and from soil maps;
- > how to read and interpret topographic and hydrologic information within a landscape and watershed;
- > basic familiarity with key soil properties and how they relate to soil management and productivity;
- > understanding of the hydrologic cycle and how management affects hydrologic processes in forest and agricultural settings;
- > the effect of management on environmental quality in terms of soil productivity and water quality.

Class Meetings: Lecture meets at 11:15 am M, W, and F in Rm. 2401 Plant Sciences; two-hour labs meet on Wednesday and Thursday in Rm. 1201, Plant Sciences Bldg. Attendance in lecture will not be taken, but is highly advised, as most important material for the course will be covered in lecture. Attendance at your assigned lab is mandatory; unexcused absences will result in a 0 grade for lab handins for that laboratory. Lab handin sheets will be due at the end of lab, or if outside work is required, by the next lab period; labs that are late, or are disorganized or messy, will be penalized. Some labs involve field trips, and students are expected to notify course instructors of any special medical conditions that may affect their participation.

Course Materials: The text for the course is available in an unbound, loose-leaf format for purchase at Pro Copies in the Baxter Street Bookstore (about \$20). Please purchase by the second lecture. You should read over the assigned chapter carefully by Wednesday of each week, and have read the lab materials before coming to your assigned lab. Material for quizzes and exams will come from the reading, labs, and lecture notes, combined; you are responsible for the week's reading, whether it is discussed in the lecture or not.

Course Grading: The course will be graded on a 90/80/70/60% basis, corresponding to A/B/C/D/F. Plus/minus grades will be given for grades 2% above or below these cutoffs. Exams and quizzes will be combined multiple choice, fill-ins, definitions, short essay, and problems. Quizzes will usually be given weekly in lecture, but may be given in lab, either announced or unannounced; hourly exams will be given in the evenings according to a schedule to be announced. All lab and lecture grades will be incorporated into a single final course grade, assigned to BOTH 3060 and 3060L, based on the following:

3 hourly exams	3 @ 100 pts	300 (46%)
Lab handin sheets	14 @ 10 pts	140 (22%)
Quizzes	13 @ 5 pts	65 (9%)
Final exam	1 @ 150 pts	<u>150 (23%)</u>
		655 (100%)

Course Instructors:

Prof. William Miller	3107 Plant Sciences	542-2461	wmiller@uga.edu
Prof. Rhett Jackson	117 Forestry Bldg.# 4	542-1772	rjackson@warnell.uga.edu
Chris Johnston	4111 Plant Sciences Bldg		cjohnst@uga.edu
Rachel Ryland	4111 Plant Sciences Bldg		rryland@uga.edu
Alicia Wilson	402 Forestry Bldg #3		amw62372@uga.edu
Nathan Melear	117 Bldg 4 Forestry		nmelear@uga.edu
Kirill Chernoff			

NOTE: The course has a website at <http://soils.uga.edu/>

All academic work must meet the standards contained in "A Culture of Honesty". All students are responsible to inform themselves about those standards before performing any academic work.

CRSS/FANR 3060: Soils and Hydrology**M date:**

-
- | | |
|--|-------------------------------------|
| 1. Landscapes
a. Landscapes: soil, water, rock
b. Views of a Landscape
c. Watersheds and landscape formation
Lab 1: <i>Maps; Rocks and Soil Profiles</i> (in 1201 Plant Sci.) | 8/15 |
| 2. Soil Profiles and Their Formation
a. Weathering of rocks
b. Soil profile formation
c. Soil horizons
Lab 2: <i>Soil Properties and Profiles</i> (in 1201 Plant Sci.) | 8/22 |
| 3. Soil Horizons and Classification
a. The soil taxonomy system
b. Diagnostic horizons
c. Soil orders
Lab 3: <i>Soil Profiles and Classification</i> (field trip, Whitehall Forest) | 8/29 |
| 4. Physical Properties of Soils
a. Soil texture
b. Soil density and porosity
c. Managing soil physical properties
Lab 4: <i>Soil and Landscape Interpretation</i> (field trip, Whitehall Forest) | 9/5
(Labor Day: No class M) |
| 5. Chemical Properties of Soils
a. Soil mineralogy
b. pH and ion exchange
c. Acidity and salinity
Lab 5: <i>Measuring Soil Physical Properties</i> (in 1201 Plant Sci.) | 9/12 |
| 6. Plant Nutrients
a. Plant nutrition and essential elements
b. N, P, and K in soils
c. Microelements
Lab 6: <i>Cation Exchange Capacity</i> (in 1201 Plant Sci.) | 9/19

<i>Exam 1 (Wks 1-5)</i> |
| 7. Soil Biology and Productivity
a. Soil organisms
b. Roles of soil organisms (humus and nutrient cycling)
c. Productivity of agricultural and forest soils
Lab 7: <i>Soil Sampling</i> (field trip) | 9/26 |
| 8. Fertilization
a. Fertilizers
b. Nutrient and soil management
c. Sustainability
Lab 8: <i>Soil Testing and Organic Matter</i> (in 1201 Plant Sci.) | 10/3 |

9. Soil Water	10/10
a. Interaction of water with soil b. Storage capacity of soils and profiles c. Water flow in soils Lab 9: <i>Soil Water</i> (in 1201 Plant Sci.)	
10. Precipitation and Evapotranspiration	10/17
a. Precipitation b. Evapotranspiration c. Modifying our Water Budget Lab 10: <i>Water Movement</i> (in 1201 Plant Sci.)	
	<i>Exam 2</i> (Wks 6-9)
11. Infiltration, Streamflow, and Ground Water	10/24
a. Water budgets b. Sources of stream flow c. Subsurface water flow Lab 11: <i>Rainfall and Runoff</i> (field trip--Greenhouse Complex)	
	<i>(Fall Break: No class F)</i>
12. Hydrologic Statistics and Hydraulics	10/31
a. Hydrographs b. Basic hydraulics c. Management effects on hydrology Lab 12: <i>Measuring Streamflow</i> (field trip)	
13. Erosion and Sedimentation	11/7
a. Importance of erosion b. Prediction and measurement c. Erosion control Lab 13: <i>Discharge and Soil Erosion</i> (in 1201 Plant Sci.)	
14. Soil Contamination and Wastes	11/14
a. Soil contamination— kinds, sources b. Risk assessment and soil management c. Waste disposal Lab 14: <i>Heavy Metals in Soils</i> (in 1201 Plant Sci.)	
[Thanksgiving Break]	(No classes M thru F, 11/21-11/25)
15. Issues in Water Quality	11/28
a. Water quality regulations b. Components of water quality c. Managing landscapes for water quality Lab 15: <i>A Walk in the Woods</i> (State Botanical Gardens)	
	<i>Exam 3</i> (Wks 10-14)
Last day of class: M, 12/5	(Review for Final Exam)
Final Exam (Wk 15 + comprehensive)	Fri, Dec. 9, 12:00 pm

Reading assignments for each week are the correspondingly numbered chapters in the course text book, *Readings in Soils and Hydrology*.

The course syllabus is a general plan for the course; deviations announced to the class by the instructors may be necessary.