Schedule

1. Landscapes (Jan 8 – 12)
   a. Landscapes: soil, water, rock
   b. Views of a Landscape
   c. Watersheds and landscape formation
      **Lab 1:** Maps; Rocks and Soil Profiles (Plant Sciences 1201)

2. Soil Profiles and Their Formation (Jan 17 – 19, Monday is MLK holiday)
   a. Weathering of rocks
   b. Soil profile formation
   c. Soil horizons
      **Lab 2:** Soil Properties and Profiles (Plant Sciences 1201)

3. Soil Horizons and Classification (Jan 22 – 26)
   a. The soil taxonomy system
   b. Diagnostic horizons
   c. Soil orders
      **Lab 3:** Soil Profiles and Classification (Whitehall Forest)

4. Physical Properties of Soils (Jan 29 – Feb 2)
   a. Soil texture
   b. Soil density and porosity
   c. Managing soil physical properties
      **Lab 4:** Soil and Landscape Interpretation (Whitehall Forest)

5. Chemical Properties of Soils (Feb 5 – 9)
   a. Soil mineralogy
   b. pH and ion exchange
   c. Acidity and salinity
      **Lab 5:** Soil Physical Properties (Plant Sciences 1201)

6. Plant Nutrients (Feb 12 – 16)
   a. Plant nutrition and essential elements
   b. N, P, and K in soils
   c. Microelements
      **Lab 6:** Cation Exchange Capacity (Plant Sciences 1201)  **Exam 1: Weeks 1-5**

7. Soil Biology and Productivity (Feb 19 – 23)
   a. Soil organisms
   b. Roles of soil organisms (humus and nutrient cycling)
   c. Productivity of agricultural and forest soils
      **Lab 7:** Soil Sampling (Whitehall Forest)

8. Fertilization (Feb 26 – Mar 2)
   a. Fertilizers
   b. Nutrient and soil management
   c. Sustainability
      **Lab 8:** Soil Testing and Organic Matter (Plant Sciences 1201)
9. Soil Water (Mar 5 – 9)
   a. Interaction of water with soil
   b. Storage capacity of soils and profiles
   c. Water flow in soils
   **Lab 9: Soil Water Content (Plant Sciences 1201)**

   **Spring Break (Mar 12 – 16)**

10. Precipitation and Evapotranspiration (Mar 19 – 23)
    a. Precipitation forms, storm events and measurement
    b. Evapotranspiration
    c. Field water budgets
    **Lab 10: Water Movement (Plant Sciences 1201)  Exam 2: Weeks 6-9**

11. Infiltration, Streamflow, and Ground Water (Mar 26 – 30)
    a. Infiltration (forest and cropland)
    b. Sources of stream flow
    c. Aquifers
    **Lab 11: Rainfall and Runoff (River Road Greenhouse Complex)**

12. Hydrologic Statistics and Hydraulics (Apr 2 – 6)
    a. Hydrographs
    b. Basic hydraulics
    c. Management effects on hydrology
    **Lab 12: Measuring Streamflow (Local Stream)**

13. Erosion and Sedimentation (Apr 9 – 13)
    a. Importance of erosion
    b. Erosion mechanics
    c. Erosion control
    **Lab 13: Discharge and Soil Erosion (Plant Sciences 1201)**

14. Soil Quality and Contamination (Apr 16 – 20)
    a. Soil contamination— kinds, sources
    b. Movement of contaminants in the landscape
    c. Risk assessment and soil management
    **Lab 14: Heavy Metals (Plant Sciences 1201)  Exam 3: Weeks 10-13**

15. Issues in Water Quality (Apr 23)
    a. Water quality regulations
    b. Components of water quality
    c. Managing landscapes for water quality
    **Lab 15: No lab**

**Review: Wed, Apr 25**

**Reading Day: Thurs, Apr 26**

**Final Exam: Fri, Apr 27, 12 - 3**
Instructors and Teaching Assistants
- Prof. Matt Levi, Plant Sciences 3107, matthew.levi@uga.edu
- Prof. Todd Rasmussen, Warnell 4-116, trasmuss@uga.edu
- Dr. Nathan Melear, Warnell 4-117, nmelear@uga.edu
- Chris Johnston, Plant Sciences 4111B, cjohnst@uga.edu
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- Aaron Joslin, Warnell 4-417 joslina@warnell.uga.edu
- Cassidy Lord, Warnell 4-116, cassidy.lord25@uga.edu

Summary
- This is a junior-level course designed as an introduction to soil science and hydrology; providing the student 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 soil or hydrology, environmental sciences, forestry, plant sciences, horticulture, crop and soil sciences, wildlife and fisheries, environmental economics, engineering, ecology, and related fields.
- The lecture and laboratory are complimentary in presenting information of both a theoretical and practical nature.
- Prerequisites for the course include introductory chemistry and algebra.

Objectives
- 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 framework;
- Basic familiarity with key soil properties and how they relate to soil management and productivity;
- Understanding the hydrologic cycle and how management affects hydrologic processes in forest and cultivated settings;
- The effect of management on environmental quality in terms of soil productivity and water quality.

Class Meetings
- Lecture meets MWF 11:15 to 12:05 in Plant Sciences 2401
- Two-hour labs meet We/Th in Plant Sciences 1201 or as indicated
- Attendance in lecture will not be taken, but is highly advised, as most important material for the course is covered in lecture.
- Attendance at your assigned lab is mandatory; unexcused absences will result in a 0 grade for lab assignments for that laboratory.
- Lab assignments are due at the end of lab, or if outside work is required, by the next Monday lecture; labs that are late, or are disorganized or messy, will be penalized.

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

- Reading assignments for each week are the correspondingly numbered chapters in the course textbook, Readings in Soils and Hydrology.
- The text for the course is available in an unbound, loose-leaf format for purchase at the Baxter Street Bookstore (on the Baxter Street hill).
- Please purchase the packet by the first lab period (W or Th).
- You must 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; note that you are responsible for the week’s reading, whether it is discussed in the lecture or not.
- The course website is at http://www.hydrology.uga.edu/rasmussen/class/3060/ and contains basic course information, old exams, and other study materials.

Course Grading

- The course will be graded on a 90/80/70/60% basis, corresponding to A/B/C/D/F, with +/- being added for grades 2% above or below these cutoffs.
- Exams and quizzes are 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 during the class period on Fridays during weeks listed on the schedule.
- Make-up quizzes, labs or exams will be made only for previously excused absences as approved by the course instructors.
- All lab and lecture grades will be incorporated into a single final course grade, based on the following:
  Hourly exams: 3 @ 100 pts = 300 (47%)
  Lab handin sheets: 13 @ 10 pts = 130 (20%)
  Quizzes: 13 @ 5 pts = 65 (10%)
  Final exam: 1 @ 150 pts = 150 (23%)
  Total = 645 (100%)