COURSE OUTLINE SOIL SCIENCE 107
SOIL PHYSICS (5)

A. Lectures

Chapter 1. Soil Physical Properties
Chapter 2. Soil-water potential – concepts and measurement
Chapter 3. Saturated water flow
Chapter 4. Water flow in unsaturated soils
Chapter 5. Field soil water regime
Chapter 6. Solute movement
Chapter 7. Gas flow
Chapter 8. Heat transfer
Chapter 9. Spatial and temporal variability of soil physical properties

B. Laboratory and field

1. Bulk density measurements in field
2. Water movement and retention in laboratory columns for several soils and conditions
3. Measurement of water content by neutron probe and time domain reflectometry (TDR)
4. Use of tensiometers and calculation of soil-water potential
5. Determination of water content-pressure relations for soils
6. Determination of hydraulic conductivity
7. Diffusion of gases
8. Solute transport

C. Problem sets - One set every week or two week

D. Discussion

Weekly one-hour discussion

1. Review of material
2. Supplemental materials
   - Examples
   - Video's
3. Problem set review
4. Review math/physics

E. Exams - 2 Midterms and a final comprehensive exam

SOIL SCIENCE 107

SOIL PHYSICS

Soil Science 107(5) D.E. Rolston/J.W. Hopmans

SOIL PHYSICS Lecture – 3 hours; laboratory – 3 hours; Discussion - 1 hour. Prerequisites: Soil Science 100, ERS 100, Mathematics 16A, or the equivalent. Description of soil physical properties. Principles of water, gas, heat, and solute movement in soils with selected examples related to soil and water management. Influence of soil physical properties on transfer processes.