

Soil Physics Laboratory (SOCR 471)

Dr. Greg Butters

Meeting times:

Thursday, 2:00-4:50

Friday, 1:00 - 3:50

Grading: Pass/Fail

There are no tests and no formal lab reports, but your measurements and calculations will be discussed in class and occasionally turned in and checked. You will usually work in small groups of your choosing. A passing grade is based on participation. *Unexcused absence from more than 1 lab sessions will result in a failing grade.*

Objective: The purpose of the soil physics lab is to provide interested students with hands-on experience and/or demonstrations of commonly used measurement techniques in soil physics. I will suggest helpful references when appropriate, but otherwise there is not a formal laboratory manual. We will begin the lab with a questions/answers period related to the SOCR 470 lecture and problem sets. We will investigate the following topics in an “ask as many questions as you wish” atmosphere.

Topics

- I. Particle properties- density and size.
- II. Soil Sampling: Destructive sampling for soil water content, bulk density, and soil texture.
- III. Measuring soil water content: Direct measurement and indirect measurement (e.g. TDR, dual-needle heat pulse method).
- IV. Measuring soil water pressure: Tensiometry (designs, materials, calibration, use.)
- V. Moisture retention curve (pressure-saturation relationship) by pressure plate.
- VI. Constant and falling-head measurement of saturated hydraulic conductivity (laboratory soil cores).
- VII. Infiltration measurements for saturated and unsaturated hydraulic conductivity (field measurement).
- VIII. Measuring air permeability of soil and gas flux (depending on equipment availability).
- IX. Energy transfer in soil- A two week heat flow experiment and measurement of soil thermal properties (thermal conductivity and heat capacity).
- X. Measurement of solute breakthrough curves.