

Soil Physics Laboratory (SOCR471)

Dr. Greg Butters

Meeting times:

Thursday, 2:00-4:50

Friday, 1:00 - 3:50

Grading: Pass/Fail

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. 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. I will suggest helpful references when appropriate, but otherwise there is not a formal laboratory manual. We will investigate the following topics in an “ask as many questions as you wish” atmosphere. We will begin the lab with a questions/answers period related to the SOCR 470 lecture and problem sets.

Topics

- I. Particle properties- size, density and specific surface.
- 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).
- 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 gas diffusivity and flux.
- IX. Energy transfer in soil; heat flow experiments.
- X. Measurement of solute breakthrough curves.