Learning objectives

While the goals of the class are quite general, the learning objectives specify what you will be able to do. They are constructed on six levels: (1) listing and defining, (2) explaining and describing, (3) calculating and solving, (4) deriving and analyzing, (5) designing and formulating, and (6) evaluating and choosing. Use these objectives to focus your study.


2. Define hydraulic conductivity, discharge (or flow), specific discharge, and average linear velocity. Explain why the average linear velocity is larger than the specific discharge. List and explain the factors that affect hydraulic conductivity. Estimate hydraulic conductivity for various soil types. Explain the measurement of hydraulic conductivity. Design a permeameter. Define transmissivity. Compute effective conductivity.

3. State Darcy’s law. Explain the terms in Darcy’s law. Explain the limitations on Darcy’s law. Determine whether Darcy’s law applies to a given flow. Use Darcy’s law to explain how the head should vary in an aquifer.


5. Explain the difference between homogeneity and isotropy. Give examples of both.

6. Derive solutions for one-dimensional steady flow in confined and unconfined aquifers under various conditions. Sketch and explain profiles of piezometric head.