

## Groundwater Hydrogeology 206-25311 – 2.5 credits

Dr. Ofer Dahan

### Syllabus

The purpose of this course is acquaintance with flow and conduction systems of subsurface solutions.

Topics covered: The hydrological cycle in the subsurface. Identification of flow systems and aquifer classification by chemo-physical characteristics. Continuity (mass balance) and moment balance in porous media. Quantitative definition of water potential in soil, make-up of potential in saturated and unsaturated zone, matrix potential, osmotic and kinetic potential. Isotropy, anisotropy, homogeneity and inhomogeneity in subsurface flow systems. Development of moment equations - Darcy's law. Development of flow equations for porous saturated system. Use of flow equations in groundwater flow systems. Solution of flow equations to calculate flow rates and characterization of physical parameters - analytical solutions, interpretation of pump tests, and numerical methods.

### Bibliography

1. Bear, J.: Hydraulics of Ground-Water. McGraw-Hill Book Company, New York 1979, 567 pp.
2. Freez, R.A. & Cherry, J.A.: Groundwater. Prentice-Hall Inc., Englewood Cliffs, N.J. 1979, 604 pp.
3. Marsily, D.E.C.: Quantitative Hydrogeology; Groundwater Hydrology for Engineers. Academic Press, London 1986, 440 pp.

### Course Requirements

Prerequisites: Introduction to Hydrology

2 hr lecture

1 hr tutorial

### Grading

80% - final exam

20% - exercises