



HYDROLOGY AND HYDROGEOLOGY

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| Lecturers : 14 | TC : 0.0 | PW : 6 | Autonomy : 0.0 | Study : 8 | Project : 0.0 | Language : FR

Objectives

Water is a natural resource essential to life, and although it covers 71% of the earth's surface, only a small fraction of this water is directly usable. Worse, this fraction is distributed very unevenly over the earth's surface, and the ever-increasing demand for water renders its management ever more critical. The engineer has a central role to play in the control and management of water resources.

Hydrology is the science of the water cycle - the exchanges between the atmosphere, the earth's surface and the subsoil. More specifically, hydrogeology is the science of groundwater.

Keywords : Hydrology, hydrogeology, water resources, precipitation, hydrographs, evaporation, evapo-transpiration, Darcy, porous media.

Programme

1. Introduction
 - the hydrological cycle
 - the distribution of water over the planet
 - a short history of water management and water treatment
2. The hydrological cycle
 - water in the atmosphere: moisture and precipitation
 - evapo-transpiration

Learning outcomes

- Students should be familiar with the major components of the hydrological cycle, and the interaction between them. They should be able to estimate their importance through order-of-magnitude calculations.
- Students should understand how to develop models which combine physical principles with real data, and should be able to apply these to the laboratory classes.
- Students should have mastered the basic equations for flow in porous media, and should be able to solve them for simple situations. They should be able to develop solutions for more complex situations through the superposition of solutions for simpler

Independent study

Objectifs : This activity is not concerned with framed autonomy activities outside personal work.

Méthodes : This activity is not concerned with framed autonomy activities outside personal work.

Core texts

Brutsaert, W., *HYDROLOGY: AN INTRODUCTION*, Cambridge University Press, 2005
Freeze, R.A. & Cherry, J.A. *GROUNDWATER*, Pearson, 1979
Shaw, E.M. *HYDROLOGY IN PRACTICE*, Taylor & Francis, 2010

Assessment

Knowledge 50% Know-how 50%
Knowledge: 40% Exam + 60% Continuous assessment
Know-how: 40% Exam + 60% Continuous assessment