

Tranfert in Natural Environments



Composante

École Nationale
Supérieure
d'Électrotechnique
d'Électronique
d'Informatique
d'Hydraulique
et des
Télécommunications

En bref

- **Code:** N8AM04A
- **Ouvert aux étudiants en échange:** Non

Présentation

Objectifs

Hydrology section:

At the end of the course you should be able to :

- Understand a report on the hydrology of a geographical area (watershed) written by people working in the field and discuss hydrology.
- Explain the physical phenomena associated with fluid transfers in the water cycle on land (infiltration, runoff, evaporation, transpiration, subsurface flow).
- Give orders of magnitude for the characteristic times associated with each of these transfers
- Explain the link between rainfall, river flow and the nature of a watershed
- Explain how statistical analyses based on the return period of an event are carried out, their usefulness and limitations.
- Search the Internet (banquehydro) for characteristic rainfall and flow events (biennial, decennial, centennial) associated with a river and a geographical area.

- Be familiar with reference resources (books, websites, manuals) in the field of hydrology and know how to retrieve information from them.

Description

This course deals with fluid transfers associated with the water cycle, and their consequences in terms of erosion and sediment transport. These two related themes are covered in two courses.

Hydrology

Hydrology is concerned with the water cycle, and more specifically with transfers between the atmosphere, the soil, the subsoil and the sea/oceans. In this course, we will focus on surface hydrology, i.e. the link between rainfall and river flow from an engineer's point of view.

Initially, we will study the local physical mechanisms responsible for the transfers observed on a macroscopic scale (infiltration/runoff, evaporation, plant transpiration, subsurface runoff). Based on soil characterization, this understanding of the physical principles associated with these transfers will enable you to analyze the differences expected in concrete situations. Next, we'll look at the link between rainfall and river flow, using both phenomenological principles based on the first part of the course, and statistical analysis of past events. This will enable you to finish the course with an understanding of the main issues at stake in real-life configurations, based on studies of reports from local players (engineering offices, RTM, river unions, municipalities).

Erosion and material transport