

## Faculty of Applied Sciences



### AMCO2192 Floods and low-water level

[22.5h] 2 credits

This course is taught in the 2nd semester

**Teacher(s):** Yves Zech  
**Language:** French  
**Level:** Second cycle

#### Aims

Introduce engineers and hydrologists to the issues associated with high and low water levels : fore-casting, regulation and mitigation, training works

#### Main themes

Forecasting of high and low water levels : empirical methods, statistical methods. Discharge regulation : reservoir management (damping of peaks and flood routing, simulation of operations, reservoir sedimentation) ; mitigation of floods induced by dam releases. Flood protection : floodplain management. Flood propagation ; flood modelling.

#### Content and teaching methods

- Introduction to flood-related issues :
  - \* Causes for flooding
  - \* Worsening factors
  - \* Flood risk management
- Forecasting of high and low water levels :
  - \* Empirical methods : method based on time series, catchment-based methods
  - \* Statistical methods : reminders
  - \* Determination of flood discharges based on extreme rainfall data : 'Gradex' method
- Discharge regulation :
  - \* Reservoir management : Damping of peaks and flood routing, Simulation of exploitation : Cumulative discharge curve, stochastic modelling (lognormal model, seasonal autoregression model of Fiering), Reservoir sedimentation : critical silting discharge, evolution of sediments characteristics, sedimentation modelling
  - \* Mitigation of floods induced by hydropower
- Flood protection :
  - \* Catchment management
  - \* Embankments
  - \* Floodplains management
- Flood propagation
  - \* Flood routing (Muskingum method)
  - \* Flood modelling (Flood cells method)
- Droughts and low water levels
  - \* Framework : origin and worsening factors
  - \* Prediction of low water levels
  - \* Analysis of dry seasons and droughts

**Other information (prerequisite, evaluation (assessment methods), course materials recommended readings, ...)**

- Complementary topic for theme "Environment" and optional topic for theme "Hydraulics"
- Prerequisites : AMCO 2151 "General and statistical hydrology ", and preferentially AMCO 2152 "Hydraulics" or equivalent
- Evaluation : oral examination

**Other credits in programs**

<b>GC21</b>	Première année du programme conduisant au grade d'ingénieur (2 credits) civil des constructions	
<b>GC22</b>	Deuxième année du programme conduisant au grade d'ingénieur civil des constructions	(2 credits)
<b>GC23</b>	Troisième année du programme conduisant au grade d'ingénieur civil des constructions	(2 credits)