

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

GC22	Deuxième année du programme conduisant au grade d'ingénieur civil des constructions	(2 credits)
GC23	Troisième année du programme conduisant au grade d'ingénieur civil des constructions	(2 credits)