



AE2612 Hydraulic Engineering

7.5 credits

Vattenbyggnad

This is a translation of the Swedish, legally binding, course syllabus.

If the course is discontinued, students may request to be examined during the following two academic years

Establishment

Course syllabus for AE2612 valid from Autumn 2017

Grading scale

A, B, C, D, E, FX, F

Education cycle

Second cycle

Main field of study

Built Environment

Language of instruction

The language of instruction is specified in the course offering information in the course catalogue.

Intended learning outcomes

After the course the student should be able to:

Describe and explain the design principles of concrete and embankment dams and perform stability computations for some of these dam types.

Perform hydraulic design of spillways and energy dissipators, channels and tubes and perform technical - economical optimization of pipes and channels.

Perform computations for different types of unsteady flow, for example: water hammer, mass oscillations in pipe systems - surge chambers, surge waves in open channels.

Describe the erosion process and design erosion protection for a channel.

Analyse different flood mitigations measures

Describe and explain the design and hydraulic function of a hydroelectric power plant and perform hydraulic calculations.

Course contents

Concrete and embankment dams: loads, design function, stability, surveillance

Spillways: hydraulic design and computations of overflow spillways, bottom outlets and energy dissipators

Transport of water: channels, tunnels, tubes, technical and economical design of tubes and channels

Hydraulics: unsteady flow, water hammer, mass oscillation and pressure transients in pipes and surge shafts, surge waves in channels

Erosion: critical shear stress, Shields diagram, design of erosion protection

Hydropower plants: design, fundamental hydraulic computations

Flood mitigation measures: detention basins, levees, reservoir regulations.

Specific prerequisites

Bachelor's degree in the field of civil engineering, environmental engineering, or another subject with clear relevance to the course, of at least 180 higher education credits, which includes the following: Basic knowledge in mathematics for at least 20 higher education credits; Basic knowledge in numerical analysis, programming, or equivalent, for at least 6 higher education credits; Fluid mechanics for at least 5 credits; Hydrology for at least 7.5 credits. Proficiency in English, English B or equivalent.

Course literature

Kursmaterial tillgängligt vid kursstart på LMS

Equipment

Allowable aids at examination: calculator.

Examination

- TEN1 - Written Examination, 3.5 credits, grading scale: A, B, C, D, E, FX, F
- ÖVN1 - Assignment, 4.0 credits, grading scale: P, F

Based on recommendation from KTH's coordinator for disabilities, the examiner will decide how to adapt an examination for students with documented disability.

The examiner may apply another examination format when re-examining individual students.

Ethical approach

- All members of a group are responsible for the group's work.
- In any assessment, every student shall honestly disclose any help received and sources used.
- In an oral assessment, every student shall be able to present and answer questions about the entire assignment and solution.