AE2105 Urban Hydrology and Climate 7.5 credits

Urban hydrologi och klimat

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

Establishment

Course syllabus for AE2105 valid from Spring 2011

Grading scale

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

Education cycle

Second cycle

Main field of study

The Built Environment

Specific prerequisites

At least 180 higher education credits of academic studies including 15 credits in physics, mechanics and hydrology (approximately 7,5 credits each) or equivalent. Documented proficiency in English B or equivalent.

Language of instruction

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

Intended learning outcomes

The course gives applied knowledge of hydrological systems in urban areas. It concentrates on specific urban flow systems and their interaction to infrastructural projects. It comprises modelling and calculations of flow systems and the human impact on surface and groundwater, using uncertainty-based methods for calibration and evaluation of model results. Further it comprises methods for mitigation and restoration of urban hydrological systems. Design of urban areas and related water management including risk analysis of hydrological hazards such as flooding.

Aim

After a fullfill of the course the participants shall be able to technically describe complex urban hydrological systems, quantify collection systems and treatement of runoff water, use quantitative modelling technique, quantify impact on the hydrological systems due to infrastructural projects such as roads, tunnels and other underground facilities. The participants shall also be able to set up monitoring programs and estimate risks of failure of technical hydrological systems and due to climate change, e.g. flooding. The participant shall be able to suggest mitigation methods in order to minimise unwanted hydrological effects in urban areas. Finally, the participants should be able to apply uncertainty based modelling techniques.

Course contents

Urban hydrological processes. Quantifying runoff and groundwater recharge in urban areas. Dimension of urban flow systems. Hydrological models in urban terrain. Qualitative impact on surface and groundwater due to human activity. Infrastructural projects and their interaction with the hydrological surroundings. Risk analysis of hydrological failure and hazards from climate change. Methods for monitoring urban hydrological systems and mitigation methods. Uncertainty-based methods for model calibration and evaluation.

Course literature

See course homepage before start of course.

Examination

- ÖVN1 - Assignment, 3.0 credits, grading scale: P, F
- TEN1 - Written Examination, 4.5 credits, grading scale: A, B, C, D, E, FX, 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.

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

Other requirements for final grade

Approved written examination (TEN1; 4,5c) and approved assignment and laboratory course (ÖVN1; 3c).

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.