AE2201 Environmental Dynamics/Physical Processes 7.5 credits

Miljödynamik/fysikaliska processer

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

Establishment

The official course syllabus is valid from autumn semester 2026 as decided by the Director of First and Second Cycle Education. Decision date: 2026-04-17

Grading scale

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

Education cycle

Second cycle

Main field of study

Environmental Engineering, The Built Environment

Specific prerequisites

Bachelor's degree in the field of Civil Engineering, Environmental Engineering, or another subject with 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. Proficiency in English (English B, English 6 or equivalent).

Intended learning outcomes

After completing the course, the student should be able to:

- understand the basic principles of modelling and have an understanding of the dynamic nature of environmental systems
- be familiar with the fundamental steps involved in constructing mathematical models in environmental engineering
- understand the stochastic/random variations in natural systems and become familiar with basic tools for quantifying uncertainty
- understand the basics of commercial modelling tools based on their documentation
- have a general understanding of process-oriented modelling in all major areas of environmental engineering and science, such as eutrophication, water quality assessment of surface water, groundwater and estuaries, and the carbon cycle.

The specific aim of the course assignments is to provide students with practical experience of independently solving modelling problems related to the flow and quality of surface water and groundwater.

Course contents

The course is divided into different sections/topics, plus assignments.

The sections are as follows:

- Available analytical tools: Conceptual foundations and general principles
- Water as a lifeline: Streams/rivers, lakes and catchment areas
- Where rivers and oceans meet: estuaries and coastal areas
- The kidneys of the water cycle: Soil and groundwater
- The biosphere: Eutrophication, ecosystems and global nutrient cycles
- Climate change: atmosphere, biosphere, hydrosphere and technosphere

Examination

- PRO1 - Project assignment, 3.0 credits, grading scale: P, F
- TENA - Written exam, 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.

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.