AL2300 Natural Resources Management Tools 7.5 credits

Verktyg för naturresursförvaltning

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

Establishment

The official course syllabus is valid from spring semester 2027 as decided by the Director of First and Second Cycle Education. Decision date: 2026-10-12.

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 with knowledge of Environmental Engineering or Natural Resources Engineering, comprising at least 180 credits, or equivalent. In addition, knowledge of Geographic Information Systems (GIS), 3 credits, or programming with elements of GIS, 3 credits, or equivalent, is required. Proficiency in English equivalent to English 6/Level 2 is also required.

Intended learning outcomes

The course aims to deepen students' knowledge and skills in the management of natural resources through the use of Geographic Information Systems (GIS). Emphasis is placed on linking natural resource and environmental data to management and governance by means of integrative techniques and tools such as scenarios and indicators.

Upon completion of the course, students will be able to:

- apply GIS to generate planning-relevant information on natural resources and the environment, including data management, modelling, expert systems, and decision-support systems;
- critically review, exemplify, and reflect upon other techniques and tools that enhance access to environmental information, such as scenarios, indicators, public and stakeholder engagement, as well as the challenges and opportunities associated with open data and big data, and the management of errors and uncertainties in data;
- demonstrate understanding, critical evaluation, and reflection on the role and significance of data and environmental information in planning, management, and other decision-making processes aimed at addressing environmental challenges and promoting the sustainable use of natural resources.

Course contents

Achieving sustainable development requires the integration of knowledge about natural resources with environmental and other sustainability dimensions, as well as the development and strengthening of links between these and planning and policy. The overarching aim of the course is to provide students with skills in spatial modelling related to planning and decision support, and to deepen their understanding of how GIS-based tools are connected to the sustainable management of natural resources.

Students will develop their knowledge and skills in GIS through extensive computer-based laboratory sessions, which demonstrate how GIS, in combination with other related tools, can be applied to generate new and relevant information for various planning and management contexts. The GIS exercises include components such as fundamental concepts, database management, modelling, coding, expert systems, advanced spatial multi-criteria analysis, and sensitivity analysis.

Methods and tools that link natural resource and environmental data and knowledge to planning and decision support are discussed throughout the course, and guest lecturers who are experts in these fields are invited to contribute to in-depth discussions. Examples of such topics include model-supported scenarios for regional planning, stakeholder participation in modelling, and the management of big data in remote sensing, among others. Together, these components provide both theoretical and practical competencies in the use of GIS and advanced tools essential for the sustainable management of natural resources.

Examination

- ÖVN1 - Exercises, 3.5 credits, grading scale: A, B, C, D, E, FX, F
- TEN2 - Written exam, 4.0 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.