AL1301 Natural Resources Theory 7.5 credits

Naturresursteori

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

Establishment

Course syllabus for AL1301 valid from Autumn 2016

Grading scale

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

Education cycle

First cycle

Main field of study

Technology

Specific prerequisites

Entry requirements: AI1527 Introduction to the Planning and Building Process

Language of instruction

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

Intended learning outcomes

On completion of the course, the student should be able to:

- have knowledge of various types of natural resources and explain how the society influences these
- explain the biogeochemical cycles including the water cycle and assess how this knowledge can be utilised to create technical solutions in an environmentally sustainable society
- perform calculations of materials and energy flow both within the anthropogenic and natural systems
- use scientific criteria to evaluate ecological status at soil and water resources in relation to their use in society
- apply basic thermodynamic principles and carry out simple energy calculations regarding renewable energy resources
- draw independent conclusions about possible results following implementation of Swedish environmental objectives and the global sustainability goals
- To summarise, orally and in writing, a relevant case study, and design or evaluate a solution.

Course contents

Material and energy sources on Earth, and the natural resource term within the context of thermodynamics. Flows of matter and water in a circular economy where e g waterborne contaminants or resources, for example, phosphorus and nitrogen. Natural cycles of elements and anthropogenic disturbances in soil, water and atmosphere. The causes of the climate change and countermeasures to reduce greenhouse gases. Adaptation of building design in relation to a changed climate. Basic calculations of the consequences of climate change for society, mainly regulation of water and construction. Increased use of renewable energy resources in the society. Strategic and technical natural resource planning and introduction of technologies for evaluation and studies of material flows with examples from the construction field. Sustainability analysis of different types of exploitations in loose earth layers, rock and water in relation to environmental quality goals. Imitation of natural cycles for recycling of materials in anthropogenic flows. Risks with reuse and material recovery from waste. The diversity and the complexity of the natural resource problems presented by the students.

Course literature

- Naturresursteori för samhällsbyggnad – Kompendium
- Övningskompendium i Naturresursteori
- Exkursionshandledning

Examination

- ÖVN1 - Exercises and Field Exercise, 2.5 credits, grading scale: P, F
- PRO1 - Project, 1.0 credits, grading scale: P, F

- TEN1 - Examination, 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.