AE1107 Geoenergy 7.5 credits

Geoenergi

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

Establishment

Course syllabus for AE1107 valid from Autumn 2012

Grading scale

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

Education cycle

First cycle

Main field of study

Technology

Specific prerequisites

Basic knowledge in mathematics and physics, involving at least 20 credits. Geology and Geotechnical Engineering (AE1102) or equivalent courses in earth science including at least 6 credits.

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 will:

- Be able to describe and understand the Earth's natural radiation balance, and exogenous and endogenous energy flows relevant to the conditions on earth, as well as natural energy transformations that occur.

- Perform basic calculations of the energy flows and energy storage in natural geoenvironments.

- Be able to describe the presence of energy resources in the geoenevironments and their durability and utilization in the long term

- Be able to use computational models for heat extractions from soil and water

- Be able to describe Swedish resources of geothermal energy to perform basic mapping of natural heat resources

- Be able to describe the nuclear cycle

- Describe disposal of residual materials from energy extraction and energy use (including nuclear waste repository, carbon storage, incineration ashes)

- Be able to make comprehensive assessments of environmental impacts in energy extraction and energy utilization of geoenergy

Course contents

Earth's radiation balance and energy flow. Exogenous and endogenous energy flows and stocks. Calculation of heat flows in soil systems. Calculation of heat extractions from soil and water. Global and regional resources of fossil geoenergy. Uranium cycle, resources and utilization. Recent and fossil biofuels, including peat. Geothermal energy, Storage of nuclear waste. Mapping models for local and regional resources of geoenergy from a long-term sustainability perspective. Environmental impact assessment of geoenergy utilization. Storage of nuclear waste. Carbon storage in natural geoenvironments.. Handling of other residues from geoenergy, such as incineration ashes.Legislation in geoenergy utilization.

Course literature

* Kursbok kommer att bestämmas senast en månad före kursstart.

* Övningsmaterial samt övrigt utdelat och digitalt tillgängligt studiematerial som anges vid kursstart.

Examination

- ÖVN1 - Exercises, 3.0 credits, grading scale: P, F
- TEN1 - 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

Written examination (TEN1), 4.5 hp

Approved exercises and individual work and participation in excursion (ÖVN1), 3 hp

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.