



MJ211V Shallow Geothermal Energy Systems 1.5 credits

Geoenergisystem

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

Establishment

The official course syllabus is valid from the Spring semester 2024 in accordance with the decision by the Head of School: M-2023-1219. Date of decision: 2023-06-20.

Grading scale

P, F

Education cycle

Second cycle

Main field of study

Mechanical Engineering

Specific prerequisites

University degree or >3 years of work experience in the energy sector and/or construction and real estate sector.

Language of instruction

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

Intended learning outcomes

1. Develop and give an account of the function and design of various geoenergy systems
2. Critically identify possibilities for use of geoenergy considering energy systems at the district level
3. Calculate and formulate recommendations for energy saving measures via geoenergy systems

Course contents

- Calculation of energy flows for geothermal cooling, geothermal heating and electricity that are input to and output from different type of geoenergy systems
- Assessment of environmental impacts when choosing various types of geoenergy systems
- Geoenergy systems for cooling and heating of buildings and processes with and without help of heat pumps
- Function and regulatory framework of important system components such as energy wells, borehole heat exchangers, reversible heat pumps, choices of secondary refrigerant and/or refrigerant
- Methods for design of various geoenergy systems, its relation to other heating, ventilation and sanitation systems in buildings and processes
- The market and responsibility of various actors in typical geoenergy projects, legal and organisational aspects
- Control and operation of geoenergy systems and interaction with the electricity market

Examination

- PRO1 - Project work, 1.0 credits, grading scale: P, F
- SEM1 - Seminars, 0.5 credits, grading scale: P, F
- DEL1 - Participation, 0 credits, grading scale: P, 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

Active participation and approval of all items of the course is a requirement for final grade

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.