SK2712 Environmental physics 7.5 credits

Miljöfysik

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

If the course is discontinued, students may request to be examined during the following two academic years

Establishment

The headmaster at the SCI school has 2021-10-13 decided to establish this syllabus to apply from Autumn 2022, registration number: S-2021-1219.

Grading scale

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

Education cycle

Second cycle

Main field of study

Engineering Physics

Specific prerequisites

Completed or ongoing degree project at the undergraduate level in the main area of technology.

English B / English 6

Language of instruction

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

Intended learning outcomes

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

- describe and reflect on various concepts and topics in environmental physics
- solve practical problems related to environmental physics
- analyze different approaches and models used in the field
- evaluate arguments and views on various aspects of sustainable development

Course contents

- Basic geophysics, the thermal and electrical properties of the planet, geomagnetism
- Solar radiation on earth, solar spectrum, interaction between light and matter, UV light and ozone layers
- Atmospheric physics, radiation balance, greenhouse effect, sea and carbon cycle, climate system
- Heat engines, storage, pumps, cooling units, combustion, cars, electricity as energy carriers
- Nuclear power, fission, fusion, fourth generation reactors, radiation and health, fuel cycle and safety
- Renewable energy, solar cells, wind and water, biomass, artificial photosynthesis, bio-solar
- Energy storage, solar-to-heat, solar-assisted chemistry, batteries, capacitors, pumped hydropower
- Chemical, electromagnetic, acoustic and radiation pollution
- Environmental monitoring, atomic and molecular spectroscopy, remote / satellite sensing
- The context of society, energy resources, consumption, fresh water, anthropogenic climate change, human footprint, planetary boundaries, food alternatives, sustainable development, science and society

Examination

- INL1 - Hand-in assignments, 3.0 credits, grading scale: P, F
- TEN1 - Oral 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.

Other requirements for final grade

For a passing grade on the course, a pass is required for all examination parts. The grade on the oral exam determines the 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.