KD2430 Nuclear Fuel Cycle 9.0 credits

Kärnbränslecykelns kemi

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

Course syllabus for KD2430 valid from Autumn 2010

Grading scale

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

Education cycle

Second cycle

Main field of study

Chemical Science and Engineering,Chemistry and Chemical Engineering

Specific prerequisites

Three years of studies in Chemical Science and Engineering at bachelor level, or equivalent.

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 should be able to:

-Describe radioactive decay and explain how different types of radiation interact with different media

-Calculate the activity of a substance by knowing the mass

-Understand how biological material is influenced by ionizing radiation

-Describe how radionuclides are enriched in natural systems

-Outline all the different parts of the Nuclear Fuel Cycle and describe them in chemical therms

-Explain the chemical impact of the different parts and describe the environmental impact

-Understand what principles a geological repository of spent nuclear fuel lean on and describe the important chemical processes whithin this system

-Relate the properties of the actinides to their chemistry

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Course contents

-Radioactive decay

-Interaction between ionizing radiation and materia

-Chemical and biological impact of ionizing radiation

-Mining of Uranium

-Enrichment of Uranium and fuel production

-Reactor chemistry

-Reprocessing of nuclear fuel

-Accidents related to the Nuclear industry

-Nuclear bomb testing

-Risk philosophy

Study visits at nuclear power plants

Course literature

G. Choppin, J.Rydberg, J.O Liljenzin. Radiochemistry and Nuclear Chemistry
Handouts

Examination

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

Study visits (STU1; 1 hp)
Project (PRO1; 2 hp)
Written Examination (TEN1; 6 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.