SH2701 Thermal-Hydraulics in Nuclear Energy Engineering 6.0 credits

Termohydraulik i kärnkraftsanläggningar

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 SH2701 valid from Autumn 2008

Grading scale

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

Education cycle

Second cycle

Main field of study

Engineering Physics

Language of instruction

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

Intended learning outcomes

The objective of the course is to provide an overview of the basic thermal processes that take place in nuclear systems. After successful completion of the course students will be able to

(a) describe the thermal and thermodynamic processes that take place in a nuclear power plant,

(b) formulate, analyze and solve simple problems in heat transfer in complex systems,

(c) formulate, analyze and solve simple problems in single- and two-phase flows,

(d) analyze dynamic and thermal loads in complex systems,

(e) perform a simple thermal design of a nuclear power plant,

(f) reflect on thermal limitations in nuclear power plant.

Course contents

The course is focusing on the thermal and thermodynamic processes in nuclear systems. Examples of the covered topics:

(1) transport equations of mass, momentum and energy,

(2) flow in pipes,

(3) mechanisms for heat transfer,

(4) convection, boiling and condensation,

(5) critical heat flux,

(6) laminar and turbulent flows,

(7) two-phase flows,

(8) critical flow,

(9) reaction forces.

Specific prerequisites

At least 120 credits in engineering and natural sciences and knowledge of English B or equivalent.

Recommended prerequisites: Good knowledge of mathematics and physics corresponding to 4th year at technical university.

Course literature

Course Compendium is provided by the Department of Nuclear Engineering.

Examination

- INLA - Assignment, 2.0 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.

Other requirements for final grade

Four home assignments (INLA 2 ECTS)
One written exam (TEN1; 4 ECTS)

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.