



SH2703 Nuclear Reactor Dynamics and Stability 6.0 credits

Reaktordynamik och stabilitet

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

Establishment

The course syllabus is valid from Spring 2022 according to the school principal's decision: S-2022-0529 Decision date: 2022-02-24

Grading scale

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

Education cycle

Second cycle

Main field of study

Engineering Physics

Specific prerequisites

Recommended prerequisites: Courses SH2701 and SH2702 or equivalent.

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

The objective of the course is to provide a deeper analysis of a nuclear reactor dynamics and stability. After successful completion of the course students will be able to

- (a) describe the time-dependent behavior of a nuclear reactor,
- (b) formulate a simple numerical model for simulation of reactor dynamics,
- (c) formulate, analyze and solve simple problems which are relevant to reactor dynamics and stability,
- (d) perform an analysis of stability of a nuclear reactor and nuclear power plant,
- (e) reflect on stability margins of a reactor under normal operation

Course contents

The course is focusing on the dynamic features of a nuclear power plant. Examples of the topics that are covered in the course:

- (1) nuclear reactor kinetics and dynamics,
- (2) point-reactor kinetic and dynamics models,
- (3) reactivity feedbacks and reactivity coefficients,
- (4) reactor stability – instability mechanisms,
- (5) instabilities of two-phase flows.

Examination

- INLA - Assignment, 2.0 credits, grading scale: P, F
- PRO1 - Projects, 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.

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

Other requirements for final grade

Home assignments (INLA 2 ECTS)
Oral 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.