SH2705 Kompakt reaktorsimulator- övningar i reaktorkinetik och reaktordynamik 6,0 hp

Compact Reactor Simulator- Exercises in Reactor Kinetics and Dynamics

Fastställande

Kursplan för SH2705 gäller från och med HT13

Betygsskala

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

Utbildningsnivå

Avancerad nivå

Huvudområden

Teknisk fysik

Särskild behörighet

Courses in reactor physics (SH2600, or equivalent) and reactor power engineering/nuclear reactor technology (SH2702, or equivalent)

Undervisningsspråk

Undervisningsspråk anges i kurstillfällesinformationen i kurs- och programkatalogen.

Lärandemål

Nuclear reactor power plants are very complex systems that may go through various transients during normal and accident situations. This course is designed to simulate the transients and explain their nature. The power plant simulations are based on Apros - the process simulation software for nuclear and thermal power plant applications.

After the course, students will be able to:

- describe various design bases and beyond design bases accidents,
- explain the behavior of the nuclear reactor and the power plant during normal operation and the transients,
- explain the effect of various feedbacks in the nuclear reactor and the power plant during the transients,
- recognize the cause of a complex transient, and take an appropriate action.

Kursinnehåll

Kursupplägg

The course gives 6 credits for a group project work (a report and presentation); possible group project topics are:

- Loss of coolant accident (LOCA)
- Reactivity initiated accident (RIA)
- Instability events
- Complex scenarios

The report and presentation have each two parts. The first part is based on a theory study, and it should contain:

- a description of possible accident scenarios studied within the selected project topic (based on the literature study and exercising the simulator)
- a classification of the identified scenarios into the design bases, beyond design bases and severe accidents
- mitigation measures for returning to the normal operation or measures for ensuring safety of public and environment for each of the identified accident scenarios

The second part in the report and presentation should show results obtained from simulations of the studied transients.

Kurslitteratur

Lecture handouts.

Examination

- PRO1 - Projektuppgifter, 6,0 hp, betygsskala: A, B, C, D, E, FX, F

Examinator beslutar, baserat på rekommendation från KTH:s handläggare av stöd till studenter med funktionsnedsättning, om eventuell anpassad examination för studenter med dokumenterad, varaktig funktionsnedsättning.

Examinator får medge annan examinationsform vid omexamination av enstaka studenter.

När kurs inte längre ges har student möjlighet att examineras under ytterligare två läsår.

Etiskt förhållningssätt

- Vid grupparbete har alla i gruppen ansvar för gruppens arbete.
- Vid examination ska varje student ärligt redovisa hjälp som erhållits och källor som använts.
- Vid muntlig examination ska varje student kunna redogöra för hela uppgiften och hela lösningen.