



# AK1002 Safety in Complex Systems 7.5 credits

Säkerhet i komplexa system

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

## Establishment

Course syllabus for AK1002 valid from Spring 2012

## Grading scale

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

## Education cycle

First cycle

## Main field of study

Technology

## Specific prerequisites

- Basic statistics and theory of probability, whether in a specific course or as part of a general university mathematics course, e.g. the course HN1002.
- Physics of Nuclear Engineering (SH1600) or equivalent knowledge.
- Nuclear Engineering (SH1700) or equivalent knowledge.

## Language of instruction

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

## Intended learning outcomes

After completed course, the student will be able to

- account for the basics of safety management and MTO ("humans - technology - organization")
- display basic ability to analyze incidents and accidents and draw relevant conclusions for the safety management from exposed defects.

## Course contents

To a high degree, the management of nuclear industry safety involves knowledge areas pertaining to the roles of the individual, the organization, and the culture - as risk contributors and as prospects of functioning safety management. Studies of the underlying causes of incidents in nuclear industry and in other complex enterprises show that individuals' actions, the organization, and cultural factors (e.g. norms, values, attitudes) have interacted with technical factors so that accidents have occurred.

The aim of the present course is to give an overview of models, technologies, experiences etc. that are used today to analyze and manage risks associated with human actions and the way organization, culture, etc., interact with human activities in the development and maintenance of nuclear technology.

The course comprises lectures and seminars. Practical examples from nuclear industry and from other safety-sensitive enterprises are given considerable space.

Content:

- Accident models
- The human element in risk management
- Learning from incidents and accidents
- Probabilistic safety analysis
- Safety management
- Safety culture

## Disposition

Lectures and seminars.

## Course literature

To be announced no later than four weeks before the course starts. Preliminary list:

- Urban Kjellén. (selected parts) Prevention of Accident Through Experience Feedback. Taylor and Francis, 2000.
- Reason, J. (1997) Managing the risk of Organizational accidents, Ashgate Publishing Limited, Aldershot.
- Rollenhagen, C. (2003). (selected parts) Säkerhetskultur, RX Media.

## Equipment

None.

## Examination

- SEM1 - Seminar Participation, 3.0 credits, grading scale: P, F
- INL1 - Written Assignments, 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.

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

## Other requirements for final grade

Seminar participation (SEM1; 3 credits) and written assignments (INL1; 4.5 credits).

## 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.