



# FEI3262 Reliability Analysis for Power Systems, Higher Course 9.0 credits

Tillförlitlighetsanalys av kraftsystem, avancerad

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 FEI3262 valid from Autumn 2011

## Grading scale

## Education cycle

Third cycle

## Specific prerequisites

## Language of instruction

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

## Intended learning outcomes

The course is aimed to you that want to perform reliability assessment for electrical power systems. The goal for the course is to give the participants knowledge on how to use reliability analysis as a tool for decision support during design, operation and maintenance of electric power systems. The application studies are focused on electrical distribution systems.

The student should after passed course be able to use reliability assessment as a tool for decision support for planning and operation of the electric power system. After completed course the participants shall achieved knowledge to:

- Describe the fundamental definitions and concepts for reliability assessment
- Analyze a system using the following techniques for reliability assessment:
  - Network modeling
  - Component importance techniques
  - Markov modeling
  - Lifetime models
- Analyze an electrical distribution system with the above described methods using NEPLAN.
- Formulate an optimization problem for maintenance planning and propose solution approach.
- Formulate a Life cycle cost model (LCC).
- Discuss power system regulatory issues.

## Course contents

Definitions and concepts in reliability theory

Network reliability modeling

Component reliability importance techniques

Markov modeling

Lifetime models

NEPLAN reliability module

Maintenance optimization techniques and problem formulation

Life cycle cost and Life cycle cost analysis

Power system regulatory methods.

Reliability project on academic or real world problem.

## Disposition

Lectures, software exercises, project work 100h, presentations of project, homework problems, exam.

## Course literature

Rausand Høyland: System Reliability Theory, 2nd ed.

## 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

- Exam
- Oral presentation
- Opponent
- Project approved and delivered before deadline

## 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.