



# FEI3364 Reliability Centred Asset Management for Power Systems 9.0 credits

Tillförlitlighetsbaserad värdevård av kraftsystem

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 FEI3364 valid from Spring 2019

## Grading scale

P, F

## Education cycle

Third cycle

## Specific prerequisites

Doctoral student

## 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 power system reliability assessment. The goal for the course is to give the participants deeper knowledge on how to use reliability analysis as a tool for decision support during design, operation and maintenance of electric power systems.

The student should after passed course have reached such level in their understanding of power system reliability that they are able to contribute to the research field. Specifically being 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 using software tools.
- \* Formulate a Life cycle cost model (LCC).
- \* Discuss power system regulatory issues.

After completed course the participants shall be able to publish results (conference level) on one of the topics:

- (1) Reliability data assessment and modeling,
- (2) Reliability centered maintenance for maintenance optimization,
- (3) Condition monitoring and diagnostics methods and
- (4) Computer tools supporting techniques for maintenance planning.
- (5) Control system reliability.

## Course contents

Definitions and concepts in reliability theory used in the course

Network reliability modeling

Component reliability importance techniques

Markov modeling

Lifetime models

Software tools

Maintenance optimization techniques and problem formulation

Life cycle cost and Life cycle cost analysis

Power system regulatory methods.

Project work on reliability

Peer review of paper (fellow student)

## Disposition

Lectures (40h), software exercises (16h), project work 120h, paper review and presentation of project (24h), homework problems and exam (40h).

## Course literature

Lecture notes and papers handed out at lectures.

Rausand Höyland: System Reliability Theory, 2nd ed.

## Examination

- EXA1 - Examination, 9.0 credits, grading scale: P, 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

- Exam
- Oral presentation
- Review of peer-paper
- 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.