EI2452 Reliability Evaluation of Electrical Power Systems 7.5 credits

Tillförlitlighetsanalys för elkraftsystem

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

Establishment

Grading scale

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

Education cycle

Second cycle

Main field of study

Electrical Engineering

Specific prerequisites

For single course students the following is required:

- University studies of 180 hp or equivalent **and**
- documented proficiency in Swedish B/Swedish 3 and English A/English 6 or equiv.

Language of instruction

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

Intended learning outcomes

The course shall give knowledge in using 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 end concepts for reliability assessment
- Analyze a system using the following techniques for reliability assessment:
- Network modelling
- Component importance techniques
- Markov modelling
- Lifetime models
- Analyze an electrical distribution system with the above described methods using the RADPOW and NEPLAN tools
- Knowledge on how reliability is treated by the network performance assessment model (NPAM).
- Formulate an Life cycle cost model (LCC)
- Formulate a reliability centred maintenance plan following fundamentals of RCM and knowledge in more advanced methods like RCAM.

Course contents

This course shows on quantitative methods to analyze and prevent risks of failure in electrical power systems, and shows on practical examples.

The lectures are concentrated to three parts of each three full days, and a final seminar. The course includes the following activities:

- Project work
- Lectures
- Invited lectures
- Home assignment
- Computer lab
- Written exam
- Seminar with presentation of project reports

Course literature

- Kurskompendium med; föreläsningsnoter, rapporter, artiklar, exempelsamling, material från matematisk statistik etc.

- Hoyland A., Rausand M., System reliability theory - models and statistical methods, Wiley Series, 2004
- Roy Billinton and Ron Allan, Reliability Evaluation of Power Systems, Plenum press, 1996.

Examination

- PRO2 - Project, 4.5 credits, grading scale: P, F
- TEN2 - Written Examination, 3.0 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

Approved project work including written and oral presentation, and computer lab (4,5 credits).
Approved examination (3 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.