# FEG3211 Analys av elkraftsystem, del 1 10,0 hp

**Power System Analysis, part 1**

## Fastställande

Kursplan för FEG3211 gäller från och med HT11

## Betygsskala

G

## Utbildningsnivå

Forskarnivå

## Särskild behörighet

The course is intended for Ph.D. students in electric power systems, but can also be interesting for students from other fields of electrical engineering.

## Undervisningsspråk

Undervisningsspråk anges i kurstillfällesinformationen i kurs- och programkatalogen.

## Lärandemål

Upon completion of the course the student should be able to

- explain static state in a power system,

- create computational models for analysis of both symmetrical and unsymmetrical conditions in power systems,
- perform load flow computations and analyze the load flow results,
- perform an optimal power flow for reactive power dispatching to decrease power losses.
- analyze the system performance where there is an unbalanced fault, and also calculate the corresponding fault current.

## Kursinnehåll

The course is given in English, and treats models and computation methods for power systems. The models and the methods are general and can be applied to industrial power system and local distribution networks as well as to national transmission networks. In the course assignments these models and methods are applied to solve realistic problems with computer programs written in MATLAB.

The following areas are treated in the course:

- Balanced system: three-phase systems, single-line equivalent, the per-unit system, circuit theorems, admittance matrixes, impedance matrixes, models of components in power systems such as lines, generators, cables, transformers, loads etc.
- Load flow analysis: problem formulation, models, solution methods.
- Optimal load flow and sensitivity analysis: reactive power dispatching to decrease power losses.
- Unbalanced system: symmetrical components, calculation methods, models of transmission lines, transformers, generators etc.
- Fault analysis: system models, and calculation of fault currents where there is an unbalanced fault.

## Kursupplägg

Lectures, assignments, exam and project.

## Kurslitteratur

L. Söder & M. Ghandhari, ”Power System Analys, Part I”

## Examination

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.

The result of the project is reported in a technical report.

## Övriga krav för slutbetyg

- Approved exam.
- Approved technical report.

## 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.