

EE-603

Transient and dynamic analysis of electric power systems

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Cursus	Sem.	Type
Electrical Engineering		Opt.

Language of teaching	English
Credits	3
Session	
Exam	Written
Workload	90h
Hours	42
Lecture	34
Practical work	8
Number of positions	

Frequency

Every 2 years

Remark

Next time: tbd

Summary

The learning outcome is to increase the knowledge of simulation methods and the role of computers in the management and the operation of electric power systems.

Content

- Dynamic phenomena:
 - Frequency range
 - Power system components modeling
 - General mathematical formulation
 - Transient stability: direct approach, time domain approach, ...
 - Small signal stability: eigenvalues, eigenvectors, participation factors, poorly damped modes, ...
 - Long term stability: load frequency control, automatic generation control, ...
 - Examples of applications

- Transient phenomena:
 - Sources of disturbances and transients in power systems.
 - Generalized transmission line theory for a multiconductor line
 - Parameters of a multiconductor transmission line
 - Effect of losses due to the ground finite conductivity and corona
 - Interaction with an external electromagnetic field
 - Solution methods in time and frequency domains (FDTD method and BLT equations)
 - Treatment of frequency dependence in a time domain algorithm
 - Treatment of nonlinearities in a frequency domain algorithm
 - Examples of application

Learning Prerequisites**Recommended courses**

Power Systems, Electromagnetism