EE-603

Transient and dynamic analysis of electric power systems

Cherkaoui Rachid, Rachidi-Haeri Farhad

Cursus	Sem.	Type
Electrical Engineering		Obl.
Energy		Obl.

Language of teaching	English
Credits	3
Session	
Exam	Written
Workload	90h
Hours	**42**
Courses	34
TP	8
Number of positions	

Frequency

Every 2 years

Remark

next time Fall 2019

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