

Module Description

Electrical Energy Systems

General Information
Number of ECTS Credits

3

Abbreviation

TSM_EIEnSys

Version

19.02.2015

Responsible of module

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Language

	Lausanne	Bern	Zürich
Instruction	<input type="checkbox"/> E <input type="checkbox"/> F	<input type="checkbox"/> D <input checked="" type="checkbox"/> E <input type="checkbox"/> F	<input type="checkbox"/> D <input type="checkbox"/> E
Documentation	<input type="checkbox"/> E <input type="checkbox"/> F	<input type="checkbox"/> D <input checked="" type="checkbox"/> E <input type="checkbox"/> F	<input type="checkbox"/> D <input type="checkbox"/> E
Examination	<input type="checkbox"/> E <input type="checkbox"/> F	<input type="checkbox"/> D <input checked="" type="checkbox"/> E <input type="checkbox"/> F	<input type="checkbox"/> D <input type="checkbox"/> E

Module category

- Fundamental theoretical principles
- Technical/scientific specialization module
- Context module

Lessons

- 2 lecture periods and 1 tutorial period per week
- 2 lecture periods per week

Brief course description of module objectives and content

In this module, students will increase their knowledge in selected areas of energy production, energy distribution and energy utilization in the systemic environment. Emphasis is placed on modern topics of electrical energy, such as grid quality, energy storages, smart-grids or the European super-grid.

Aims, content, methods
Learning objectives and acquired competencies

- 1.1 know the main challenges of today's modern grids
- 1.2 know the main elements of an electrical grid and the differences of transmission components
- 1.3 know the DC transmission technology
- 2.1 know the worldwide importance of primary energies as regards the electricity market;
- 2.2 can explain the market pressure by suppliers of fossil primary energy;
- 2.3 know obstacles for the market entrance of renewable energies;
- 3.1 know the significance and the possibilities of energy storages and are able to name at least two pro and two contras of each storage type in specific applications;
- 3.2 know fundamental points in the integration of accumulators and supercapacitors;
- 3.3 can describe the significance of smart-grids and there interaction with energy storages
- 4.1 know who frequency stability can be reached and what errors can arise in the network and know how to protect the equipment;
- 4.2 learn the basic principles of the management and regulation of electrical grids;
- 4.3 learn to assess the dynamic stability of networks and know quality attributes of grids;

