

# Power System Dynamics and Control

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Date	Tue 8-12, lectures: ETZ E 6, exercises: ETZ D61.1
Hours/Credit points	6 credits
Type	Elective course
Course number	227-0528-00L

## Subject

Dynamic processes in power networks, regulation of turbines and voltage control, stability, protection of transmission lines.

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## Contents

Dynamic properties of electrical machines, networks, loads and interconnected systems. Models of power stations and turbines, control of turbines, load- and frequency control, power exchange between networks, model of the synchronous machine connected with the network, transient model, block diagram, behaviour of the machine in case of disturbances, transient stability, equal area criterion, model for small disturbances, voltage control. Facts-Devices. SCADA/State Estimation. EMS-Implementations, Protection, Asset Management, Future Trends in IT for Power Systems.

- Precondition: Modelling and Analysis of Power Networks (recommended)

### Lecture notes:

[Part 1 pdf](#), Available also at [SPOD](#)

[Part 2 pdf](#), Available also at [SPOD](#)

**Lecture plan:** [pdf](#)

### Useful material:

P1 – Policy 1: Load-Frequency Control and Performance [pdf](#)  
Development in Power-Frequency Characteristic and Droop of UCPTE Power System and Proposals for new Recommendations for Primary Control [pdf](#)

Lecture Slides

Foil



21.02.2012 Dynamics (Chap. 1,2,3)	📄
28.02.2012 Dynamics (Black Outs)	📄
06.03.2012 Control Technology (Chap. 1)	📄
13.03.2012 Dynamics (Chap. 4-7)	📄
20.03.2012 Control Technology (Chap. 3,4)	📄
27.03.2012 Control Technology (Chap. 2)	📄
03.04.2012 Dynamics (ENTSO-E)	📄
24.04.2012 Dynamics (Heffron-Phillips Model, PSS)	📄