



TECHNISCHE  
UNIVERSITÄT  
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## GUEST LECTURE

### **370.020 Active Filters and FACTS (Flexible AC Transmission System) elements 2013S, VU, 2,0h, 3.0EC**

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#### **Aim of course**

The aim of the course is to acquire the basic knowledge of modern power-electronics based devices used in power transmission systems (FACTS devices) and power distribution systems (active filters).

#### **Subject of course**

Introduction to FACTS (Flexible AC Transmission System) devices and active filters. Description of main power semiconductor devices (diode, thyristor, GTO, IGBT). Operation of thyristor controlled elements and of voltage source converters (VSC), description of different VSC topologies and techniques for voltage control. Fundamentals of power transmission (line loading capability, dynamic stability considerations). Description and operation of FACTS devices (SVC, Statcom, TCSC, SSSC, UPFC). Fundamentals of high-voltage DC transmission. Description and operation of active filters (parallel and series connection, hybrid active filter). Introduction to solid-state switching devices. Derivation of a Statcom transient model and control algorithm. Derivation of a SVC transient model and control algorithm. Simulation cases with the use of the PSCAD simulation software.

#### **Additional Information**

Block course, "Übungsraum CF0426", Gußhausstr. 25, 4th floor:

21.3.2013: 13.00-14.00 h;

11.4.2013, 12.4.2013, 18.4.2013, 19.4.2013, 25.4.2013, 26.4.2013: 13.00-16.00 h

Oral exam: 2.5.2013: 13.00 h