Fachbereich Maschinenbau und Verfahrenstechnik
Faculty of Mechanical and Process Engineering

Formal Details

Lecturer	T. Spiegel
Contact	thomas.spiegel@hs-duesseldorf.de
Teaching Format	Lecture, Excercises, Computer lab
Language	English
Prerequisites	Open to students from the 1st semester onwards
Type of examination	Exam + project report

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Contents

- Introduction to three-phase AC systems, per-unit system, single-line diagrams
- Power system modeling (transmission lines, transformers) and network admittance matrix
- Power flow analysis with Gauss–Seidel and Newton–Raphson methods
- Active power/frequency control, voltage control, and reactive power compensation in power system operation
- Symmetrical components and their application in fault analysis
- Short-circuit current calculation for balanced and unbalanced faults
- Neutral grounding methods and their impact on fault currents
- Fundamentals of protection systems and selectivity