

Title: Electric Power Networks and Devices

Lecturer: Prof. Dr. Boštjan Blažič

Aim of the course:

To acquire the knowledge of main elements and devices of electric power networks; to enhance the knowledge of modeling and parameters of electric power elements for mathematical analysis of power systems.

Required (pre)knowledge:

Fundamentals of electrical engineering

Contents:

Development of electric power networks and general division of power networks. Mechanical parameters of overhead power lines, construction of lines, and electrical parameters of overhead power lines.

Composition of high voltage power cables, construction of power cables, impedances of single-core and three-core cables. Loading criteria of power networks. Electrical parameters of two winding and three winding transformers, synchronous generators and induction machines.

Types of power substations with different implementations of switchyards. High voltage switching technology – circuit breakers and other switching devices.

Classical power factor correction devices, passive filters and reactors. Modern compensation devices with power electronics modules.

Distributed power sources and active networks.

Selected references:

Kiessling, F., Nefzger P., Nolasco J.F., Kaintzyk U., Overhead Power Lines: Planning, Design, Construction, Springer Verlag, 2003.

Papič I., Žunko P., Elektroenergetska tehnika I (Electric Power Engineering I), Založba FE in FRI, 2009.

Bergseth F.R., Introduction to Electric Energy Devices, Prentice Hall, 1988.