

STUDY UNIT DESCRIPTION

Faculty of Electrical Engineering

CODE _____

TITLE Power supply of industrial enterprises

LEVEL 1 - Year 3 in Modular Undergraduate Course

ECTS CREDITS 3,5

DEPARTMENT Power supply systems

DESCRIPTION Electrical equipment in power nets upper 1000 V. Power transformers. Circuit breakers. Disconnect switches. Contactors. Grounding switches. Characteristics and selection of power equipment.

Schemes of substations and industrial enterprises power systems. Reliability of power supply. Outdoor and indoor switchgears.

Electrical equipment in power nets under 1000 V. Characteristics and selection of power equipment.

Types of electrical loads. Electrical loads calculation. Load diagrams and their characteristics.

Faults in power supply systems. Protection of power nets and electrical equipment. Calculation of protection relays settings.

Short circuit currents calculation in power nets upper and under 1000 V.

Reactive power. Compensation of the reactive power.

Power supply of variable speed electric drivers. Harmonic currents. Reactive and active filters.

Study-unit Aims:

The unit outlines base principles of operation of the power supply systems: electrical equipment (applications, modes of operation, control), electrical nets and their schemes, fault modes and fault protection, equipment energy factors. The unit gives base for the analysis and synthesis of power supply systems of industrial enterprises.

Learning Outcomes:

1. Knowledge & Understanding;

By the end of the study-unit the student will be able to:

- read and build schemes of power supply systems;
- select power equipment for net upper and under 1000 V;
- calculate short circuit currents in power supply system of an industrial enterprise;
- select protection equipment and calculate settings of protection relays.

2. Skills:

By the end of the study-unit the student will be able to:

- compose the structure of the power supply system for typical equipment of industrial enterprise;
- determine parameters and characteristics of power supply systems operation.

Main Text/s and any supplementary readings:

- Chan, Shu-Park “Section I – Circuits” The Electrical Engineering Handbook Ed. Richard C. Dorf. Boca Raton: CRC Press LLC, 2000.

- Power systems / editor, Leonard Lee Grigsby. 2007 by Taylor & Francis Group, LLC. ISBN-13: 978-0-8493-9288-7

ADDITIONAL

NOTES Pre-requisite Study-units: Theoretical fundamentals of electrical engineering, Electrical machines.

STUDY-UNIT TYPE

Lecture and Tutorial, laboratory works

METHOD OF ASSESSMENT

Assessment Component/s	Resit Availability	Weighting
Practical	No	10%