COURSE DESCRIPTION CARD - SYLLABUS

Course name
Transient states in electric power circuits

Course

Field of study
Electrical Engineering
Year/Semester
2/3
Area of study (specialization)
Distribution Devices and Electrical Installations
Profile of study
general academic
Level of study
Second-cycle studies
Course offered in
polish
Form of study
full-time
Requirements
elective

Number of hours

Lecture
0
Laboratory classes
0
Other (e.g. online)
0
Tutorials
0
Projects/seminars
15

Number of credit points

1

Lecturers

Responsible for the course/lecturer:
Grzegorz Dombek, Ph. D., Eng.

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Responsible for the course/lecturer:

Prerequisites

Basic knowledge on electrical engineering, mathematics, physics and electrical devices. Able to perform analysis of steady state and transient state in electrical circuit. A sense of the need to broaden the competence and willingness to work together in a team.

Course objective

Knowledge of steady state and transient state methods of calculation in electrical devices and systems. Purchase of skills in calculation and analysis of current and voltage waveform.

Course-related learning outcomes

Knowledge

He/she knows transient phenomena occurring in power devices and systems and their characteristics. He/she knows how to formulate a mathematical and physical description of phenomena and knows the methods of analyzing this description.

Skills

He/she is able to perform the calculation of current and voltage waveform occurring in transient states of electrical power supply systems. He/she is able to perform analysis of important parameters resulting from the calculation taken into account in designing and testing electrical devices and power supply systems.

Social competences

A sense of importance of phenomena analyze to procedure formulation of devices and power supply systems designing and in diagnostic methods. A sense of influence of phenomena on the environment and the people working with electrical equipment and using them.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Projects:

- the preparation of materials for the project is evaluated,

- substantive preparation for the implementation of the assigned project is evaluationed,

- project and its defense are evaluated.

Programme content

Projects:

Calculation of short-circuit current in power supply systems and installations and resulting normative parameters (short-circuit current, peak value of short-circuit current, let-through energy). Comparison of calculated waveform with measured during switching of short-circuit current by Modular Circuit Breakers (MCB) and fuses. Transient recovery voltage (TRV) calculation in one and three phase circuits. Switching in long power line - method of traveling waves. Conclusions resulting from calculations of transient state for electrical devices, power system and installation designer. Application of transient state analyze to diagnostic and measurement in electric power system and installation.

Teaching methods

Projects:

- using dedicated or developed computer applications, graphic programs and producers catalogs of power devices and installation equipment,

- multimedia or object-oriented presentations supported by illustrated examples presented on the board.

Bibliography

Basic

1. A. Kamińska A, L. Muszyński, Z. Boruta, R. Radajewski, Nowoczesne techniki w projektowaniu energooszczędnych instalacji budynkowych w systemie KNX, POIG.02.02.00-00-018/08-00, Warszawa 2011.

2. C. Królikowski, Z. Boruta, A. Kamińska, Technika łączenia obwodów elektroenergetycznych. Przykłady obliczeń, PWN Warszawa 1992.

3. J. Maksymiuk, J. Nowicki, Aparaty elektryczne i rozdzielnice wysokich i średnich napięć, Wydawnictwo Politechniki Warszawskiej, Warszawa, 2014.

4. K. Żmuda, Elektroenergetyczne układy przesyłowe i rozdzielcze. Wybrane zagadnienia z przykładami, Wydawnictwo Politechniki Śląskiej, 2014.

Additional

1. J. D. Glover, M.S. Sarma, T.J. Overbye, Power System Analysis and Design, cengage Learning, Inc, Florence, KY, US, 2011.

Breakdown of average student's workload

	Hours	ECTS
Total workload	35	1,0
Classes requiring direct contact with the teacher	20	1,0
Student's own work (literature studies, preparation for classes, project preparation) [1]	15	1,0

[1] delete or add other activities as appropriate