COURSE DESCRIPTION CARD - SYLLABUS

Course name
Electrical devices [N1Eltech1>UE2]

Course

Field of study
Electrical Engineering

Year/Semester
4/7

Area of study (specialization)
–

Profile of study
general academic

Level of study
first-cycle

Course offered in
polish

Form of study
part-time

Requirements
compulsory

Number of hours

Lecture
10

Laboratory classes
10

Other (e.g. online)
0

Tutorials
0

Projects/seminars
0

Number of credit points

3,00

Coordinators

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Lecturers

Prerequisites

Basic knowledge on electrical engineering, electrical devices from semester 5 and electrical metrology. Able to carry out mathematical and physical analysis of phenomena occurring in power equipment and systems, knows how to read electrical diagrams. Aware of the need to expand their competences, readiness to cooperate within a team.

Course objective

Understanding the principles of operation of power equipment, systems and the role of transformer distribution stations, methods of analyzing the reliability of station work. Student is able to design the power supply and transformer-distribution station system and select the equipment. Planning the experiment, selection of measuring instruments and implementation of the testing system as well as carrying out tests and processing the results.

Course-related learning outcomes

Knowledge:
Student knows how to explain the principle of operation of power equipment. Knows the basic systems of distribution stations, the way they work, methods of analyzing the reliability of station work.

Skills:
Student is able to design the power supply and distribution station system. Student is able to carry out calculations and analyzes necessary for the selection of devices in power distribution stations. Student is able to plan the experiment, select the system and testing devices, carry out tests and develop the results of measurements.

Social competences:
Student is aware of the impact of the correct selection of the power distibution station system and devices on ensuring continuity of electricity supply to various consumers. Student is aware of the impact of phenomena and devices and distribution stations on the environment and people working on and using power equipment.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

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Lecture:
- knowledge acquired as part of the lecture is verified by a written final exam consisting of open or test questions with different points. Passing threshold: 50% of points,
- current grading in each lecture (rewarding activities).
Laboratory classes:
- current check and rewarding knowledge necessary for the accomplishment of the problems in the area of laboratory tasks,
- evaluation of reports performed on laboratory classes,
- rewarding activities related to the implementation of laboratoy classes.

Programme content

Lecture:
High voltage switches: classification, circuit-breakers, disconnectors, switches, fuses, short-circuit current limiters. Current, voltage and combined transformers. Equipment and main circuits of distribution stations: station connection systems, transformers, autotransformers, station construction solutions. Auxiliary devices and devices managing station operation: station"s own needs, limiting short-circuit currents, lightning and surge protection.
Laboratory classes:
Classes discussing the regulations of the laboratory, topics of laboratory classes and OHS training related to the operation of laboratory positions. To perform 4 two-hour laboratory classes in the field of lecture.

Teaching methods

Lecture:
- multimedia or object-oriented presentations supported by illustrated examples presented on the board,
- interactive lecture with questions and initiating discussions.
Laboratory classes:
- object-orientedpresentations supported by illustrated examples presented on the board,
- presentations of selected experiments,
- initiating teamwork.

Bibliography

Basic
1. Markiewicz, H. Urządzenia elektroenergetyczne, WNT, Warszawa, 2006.
2. Markiewicz, H. Bezpieczeństwo w elektroenergetyce, WNT, Warszawa, 2017.
3. Kamińska, A. Urządzenia i stacje elektroenergetyczne, Wydawnictwo Politechniki Poznańskiej, 2000.
4. Maksymiuk, J., Nowicki, J. Aparaty elektryczne i rozdzielnice wysokich i średnich napięć, Wydawnictwo Politechniki Warszawskiej, Warszawa, 2014.
5. Żmuda, K. Elektroenergetyczne układy przesyłowe i rozdzielcze. Wybrane zagadnienia z przykładami, Wydawnictwo Politechniki Śląskiej, 2014.
Additional

1. Glover, J. D., Sarma, M.S., Overbye, T.J. Power System Analysis and Design, cengage Learning, Inc, Florence, KY, US, 2011
2. Wasiak, I. Elektroenergetyka w zakresie Przesył i rozdział energii elektrycznej, Politechnika Łódzka, 2010.
3. Królikowski, C.,Boruta, Z., Kamińska, A. Technika łączenia obwodów elektroenergetycznych. Przykłady obliczeń, PWN, Warszawa, 1992.
4. Maksymiuk, J. Aparaty elektryczne. Podstawy doboru i eksploatacji. WNT, Warszawa, 1977.
5. Au, A., Maksymiuk, J., Pochanke, Z. Podstawy obliczeń aparatów elektroenergetycznych. WNT, Warszawa, 1982.

Breakdown of average student's workload

	Hours	ECTS
Total workload	70	3,00
Classes requiring direct contact with the teacher	20	1,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	50	2,00