COURSE DESCRIPTION CARD - SYLLABUS

Course name

Design and diagnostic of distributive devices

Course

Field of study

Electrical Engineering

Year/Semester

2/4

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

part-time

Requirements

compulsory

Number of hours

Lecture

10

Laboratory classes

10

Other (e.g. online)

0

Tutorials

0

Projects/seminars

10

Number of credit points

3

Lecturers

Responsible for the course/lecturer:

Prof. Jerzy Janiszewski, Ph. D., Hab. Eng.

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Institute of Electric Power Engineering

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Responsible for the course/lecturer:

Prerequisites

Basic knowledge on the construction and operation of electrical devices and installations as well as measuring apparatus and its use. Ability to obtain information from subject literature and other sources as well as critically analyze them. Ability to use analytical, simulation and experimental tools. Understanding the need for creative action.

Course objective

Understanding the principles of designing structural elements of distribution devices and methods for diagnosing the parameters of devices operating in normal and fault states.

Course-related learning outcomes

Knowledge

Student has ordered knowledge in the field of design and diagnostics of typical structural elements of switchgear.

Skills

Student is able to use mathematical models to design and analyze the operating status of electrical equipment components. Student is able to carry out diagnostic measurements and verify the quality of the tested object.

Social competences

Student can think and act in a professional manner. Student understands the need for education in various fields and understands the need for innovative testing of the condition of devices to ensure their operational safety.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture:

- knowledge acquired as part of the lecture is verified by a written final test 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.

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

Lecture:

Operating conditions of electrical power devices, determination of thermal load capacity of devices in operating and fault conditions, as well as designing current circuits for switches and distribution devices. Thermal and electrodynamic calculation of current circuits of switches and power distribution stations,

design of short-circuit chokes and contacts of switches and electrical connections of distribution devices; modeling and studying phenomena in contacts. Diagnostic tests of electrical devices, legal requirements for diagnostic tests of electrical devices and apparatus, test periods and qualification requirements of those performing the tests; modern, alternative diagnostic methods for power equipment. Diagnostic instruments and their accuracy, acquisition and recording of test results. Diagnostic test selected.

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.

Projects:

Assigned project to be implemented in the field of design of distributive devices including output data, design diagrams, replacement diagrams and technical calculations.

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.

Projects:

- using dedicated or developed computer applications, graphic programs and catalogs of installation equipment manufacturers.

Bibliography

Basic

1. Maksymiuk J: Niezawodność maszyn i urządzeń elektrycznych, Oficyna Wydawnicza PW, 2003.

2. Kupras K.: Pomiary w elektroenergetyce ?wytyczne, wyd. SEP, 2007

3. Maksymiuk J., Pochanke Z.: Obliczenia i badania diagnostyczne aparatury rozdzielczej, wyd.1, WNT, 2001.

4. Au A., Maksymiuk J., Pochanke Z.: Podstawy obliczeń aparatów elektroenergetycznych, WNT, 1995.

5. Maksymiuk J.: Aparaty elektryczne, PWN, Warszawa, 1995.

6. Chmielak W., Daszyński T., Pochanke Z.: Laboratorium Aparatów elektrycznych, Oficyna wydawnicza PW, 2017.

7. Konopacki Z., Gryżewski Zd.: Prace kontrolno-pomiarowe przy urządzeniach elektroenergetycznych o napięciu znamionowym do 1 kV, COSTW SEP, Warszawa,1999.

Additional

1. Wiśniewski S., Wiśniewski T.S.: Wymiana ciepła. WNT, Warszawa, 1997

2. Periodyki: Elektroinstalator, Elektroinfo

3. Poradnik inżyniera elektryka, WNT, 2009

4. Internet publications.

5. Standards.

6. Przepisy Budowy Urządzeń Elektroenergetycznych, Wydawnictwa Przemysłowe WEMA, Warszawa, 1997.

Breakdown of average student's workload

	Hours	ECTS
Total workload	85	3,0
Classes requiring direct contact with the teacher	40	2,0
Student's own work (literature studies, preparation for laboratory classes, preparation of reports, preparation for tests, project preparation) [1]	45	2,0

[1] delete or add other activities as appropriate