COURSE DESCRIPTION CARD - SYLLABUS

Course name

Design and diagnostic of distributive devices

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

15

Laboratory classes

0

Other (e.g. online)

0

Tutorials

0

Projects/seminars

15

Number of credit points

2

Lecturers

Responsible for the course/lecturer:

Prof. Krzysztof Walczak, Ph. D., Hab. Eng.

Faculty of Environmental Engineering and Energy

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).

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:

Contacts and contact materials used in electrical devices and apparatus. Working and short-circuit working conditions for contacts. Presentation of construction solutions for tracks and contact systems of sample switches. Design of contacts, switches and electrical connections of switchgear devices, modeling and research of phenomena in contacts. Design of short-circuit reactors. Diagnostic tests of electrical devices. Legal requirements for diagnostic tests of electrical devices and apparatus, test periods and qualification requirements for performing tests; modern, alternative diagnostic methods of power devices. Diagnostic instruments and their accuracy, acquisition and recording of test results. Diagnostic examination of selected switchgear.

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.

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	55	2,0
Classes requiring direct contact with the teacher	30	1,0
Student's own work (literature studies, preparation for tests, project preparation) [1]	25	1,0

[1] delete or add other activities as appropriate