COURSE DESCRIPTION CARD - SYLLABUS

Course name
Project of high voltage insulating systems

Course

Field of study
Electrical Enginnering

Year/Semester
2/3

Area of study (specialization)
High Voltage Engineering

Profile of study
general academic

Level of study
Second-cycle studies

Course offered in
Polish

Form of study
full-time

Requirements
compulsory

Number of hours

Lecture
15

Laboratory classes
15

Other (e.g. online)
0

Tutorials

Projects/seminars
15

Number of credit points

5

Lecturers

Responsible for the course/lecturer:
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Piotrowo 3a Str., 60-965 Poznań

Responsible for the course/lecturer:

Prerequisites

Student starting this course:
1. Has knowledge in frame of electrical engineering material science and knows fundamental principles related to electrical circuits theory, and has fundamental knowledge in the area of high voltage engineering.
2. Can build simple electrical system and make measurements of physical properties related to insulation systems. He/she can make measurements of high voltage using various methods.
3. Can work and cooperate in group. He/she knows influence of high voltage insulation systems on natural environment.

Course objective

The aim of the course is getting knowledge about disigning of high voltage insulation systems used in

electric power devices such as insulators, transformers, capacitors, cables and GIS substations, and discussion of the issues related with potencial and elaectric field intensity distribution.

Course-related learning outcomes

Knowledge

1. Has knowledge in the design of high voltage insulation systems.
2. Has extended knowledge in the field of operation of high voltage equipment insulation systems.

Skills

1. Is able to design high voltage insulation systems.
2. Can propose improvements to existing solutions for high voltage insulation systems.

Social competences

1. Is aware of the knowledge in solving practical problems.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lectures:

1) Assessment of knowledge and skills proved on written exam

Laboratories:

1) Assessment of knowledge and skills related to performed laboratory classes - assessment of laboratory report
2) Continuous checking of the preparation for the laboratory classes

Project:

1) Assessment of the project task

Programme content

In the frame of lectures the following topics are presented:
disigning of high voltage insulation systems used in electric power devices such as insulators, transformers, capacitors, cables and GIS substations, issues related with potencial and elaectric field intensity distribution.

In the frame of laboratory classes the problems related to high voltage insulation systems, used in electric power systems, such as insulators, transformers, cables, capacitors, GIS substations.

In frame of project, students design chosen high voltage insulation system (insulator, transformer, capacitor, cable).

Teaching methods

The theory presented during lectures is closely related to practice. During the lecture a discussion is initiated. Lectures with multimedia presentation (including: figures, photos, videos) complemented by the information on the board.

Laboratory classes are done in teams. Laboratory reports are reviewed by the instructor and discussed in the presence of the author.

Project classes are supplemented by multimedia presentations, a detailed review of the project documentation is carried out by the project leader. The use of tools enabling students to perform tasks at home (e.g. open source software) is foreseen.

Bibliography

Basic

1. Flisowski Z., Technika wysokich napięć, Wydawnictwo Naukowo-Techniczne, Warszawa 2017
2. Furgał J., Układy izolacyjne urządzeń stacji wysokiego napięcia, Wydawnictwo AGH, Kraków 1995
3. Gacek Z., Wysokonapięciowa technika izolacyjna, Wydawnictwo Politechniki Śląskiej, Gliwice 2006
4. Mościcka-Grzesiak H., Ćwiczenia laboratoryjne z materiałoznawstwa elektrotechnicznego i techniki wysokich napięć, Wydawnictwo Politechniki Poznańskiej, Poznań 2002
5. Gielniak J., Ćwiczenia laboratoryjne z inżynierii materiałowej w elektrotechnice, Wydawnictwo Politechniki Poznańskiej, Poznań 2009

Additional

1. Mościcka-Grzesiak H., Inżynieria wysokich napięć w elektroenergetyce, Wydawnictwo Politechniki Poznańskiej, tom I – 1996
2. Mościcka-Grzesiak H., Inżynieria wysokich napięć w elektroenergetyce, Wydawnictwo Politechniki Poznańskiej, tom II – 1999
3. Celiński Z., Materiałoznawstwo elektrotechniczne, Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa 2005
4. Lisowski M., Pomiary rezystywności i przenikalności elektrycznej dielektryków stałych, Oficyna Wydawnicza Politechniki Wrocławskiej, Wrocław 2004

Breakdown of average student's workload

	Hours	ECTS
Total workload	125	5,0
Classes requiring direct contact with the teacher	70	3,0
Student's own work (literature studies, preparation for tests) [1]	55	2,0

[1] delete or add other activities as appropriate