COURSE DESCRIPTION CARD - SYLLABUS

Course name
Ergonomics and safety use of electrical equipment [N1Eltech1>EiBUUE]

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
0

Tutorials
0

Projects/seminars
0

Number of credit points

2,00

Coordinators

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Lecturers

Prerequisites

Basic knowledge on physics and electrical devices. Able to connect electrical devices to Low Voltage network and read electrical wiring schemes. A sense of the need to broaden the competence and willingness to work together in a team.

Course objective

Understanding the hazards associated with electrical equipment and the principles and measures of protection against these hazards. Able to asses the nature and degree of electric shock and select measures of protection. Knows the general requirements of ergonomics and fulfill them in a limited way.

Course-related learning outcomes

Knowledge:
Know how determine and explain the dangers due to effects of electric current on living body. Knows and able to explain the rules and measures of protection against electric shock. Knows the general notions of ergonomics. Student has knowledge about the operation of the energy system, the principles of its operation and safe functioning.

Skills:
Able to estimate the risk of electric shock. Able to select measures of protection, estimate the risk of electric shock appropriate to the conditions and degree of risk. Able to apply the rules of ergonomics in the development and use of exemplary electrical devices and installation.

Social competences:
A sense of dangers inappropriate design, realization and using of electrical devices and systems for people life and health. A sense of ergonomics role in designing and realization of electrical devices and installations.

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 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.

Programme content

The effect of electricity on the human body, factors influencing the effects of electric shock, means of protection against electric shock in low- and high-voltage electrical installations. Ergonomic requirements for manufacturers, designers and users of electrical devices and systems.

Course topics

Lecture:
- Effect of electricity on the human body,
- Discussion of factors influencing the effects of destruction,
- Types of protection against electric shocks,
- Principles and technical implementation of protection against electric shocks in low-voltage electrical installations,
- Technical and organizational measures for protection against electric shock in power installations with voltage higher than 1 kV,
- Definitions and thematic scope of ergonomics,
- Discussion (based on examples) of ergonomic requirements for the manufacturer,
designer and user of electrical devices and systems.

Laboratories:
- Overview of the classes: topics, literature, requirements, reports, health and safety,
- The influence of the shape of the shock current on the operation of residual current circuit breakers,
- Operational tests of protection class I and II devices,
- Operational measurements of energy capacitor banks for reactive power compensation,
- Summary of classes, reports and assessment.

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., Bezpieczeństwo w elektroenergetyce, PWN, 2009.
2. Markiewicz H., Instalacje elektryczne, WNT, Warszawa, 2013.
3. Instalacje elektryczne niskiego napięcia - Część 4-41: Ochrona dla zapewnienia bezpieczeństwa - Ochrona przeciwporażeniowa PN-HD 60364-4-41, Polski Komitet Normalizacyjny.
Additional
1. Ustawa Prawo budowlane.
2. Ustawa Prawo energetyczne.

Breakdown of average student's workload

	Hours	ECTS
Total workload	55	2,00
Classes requiring direct contact with the teacher	30	1,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	25	1,00