

Industrial installations and devices - opis przedmiotu

Informacje ogólne	
Nazwa przedmiotu	Industrial installations and devices
Kod przedmiotu	06.2-WE-ELEKTD-IIandD-SPIE
Wydział	Wydział Informatyki, Elektrotechniki i Automatyki
Kierunek	Elektrotechnika
Profil	ogólnoakademicki
Rodzaj studiów	Program Erasmus drugiego stopnia
Semestr rozpoczęcia	semestr zimowy 2022/2023

Informacje o przedmiocie	
Semestr	3
Liczba punktów ECTS do zdobycia	4
Typ przedmiotu	obowiązkowy
Język nauczania	angielski
Sylabus opracował	dr hab. inż. Jacek Kaniewski

Formy zajęć					
Forma zajęć	Liczba godzin w semestrze (stacjonarne)	Liczba godzin w tygodniu (stacjonarne)	Liczba godzin w semestrze (niestacjonarne)	Liczba godzin w tygodniu (niestacjonarne)	Forma zaliczenia
Wykład	30	2	-	-	Zaliczenie na ocenę
Laboratorium	15	1	-	-	Zaliczenie na ocenę
Projekt	15	1	-	-	Zaliczenie na ocenę

Cel przedmiotu

C1W. Transfer of knowledge about the most common industrial devices and the specifics of their power supply.

C1U. Understanding the specifics of work and the principles of operation of basic industrial devices and the principles of their power supply and control.

C1K. Awareness of the role of continuous improvement of industrial equipment in terms of functionality and energy consumption.

Wymagania wstępne

electrical engineering, power electronics, physics

Zakres tematyczny

Lecture

Power supply systems and the structure of industrial distribution networks. Introduction and basic information.

Rules for the selection of power supply systems for industrial plants and internal distribution networks.

Short-circuit current limitations and reactive power compensation in industrial networks.

Characteristics of industrial receivers - energy consumption and impact on the industrial network.

Industrial electric heating. Basic concepts, classification, operation.

Thermal processes and control in industrial electrothermal systems.

Types of heating systems - resistive, radiant, electrode, arc, induction, capacitive, microwave, etc.

Industrial welding systems - construction, power supply, control.

Compressor systems and compressed air systems - construction, power supply, control.

Supply of industrial machine tools and production sockets.

Pump and fan systems.

Industrial air conditioning and refrigeration systems.

Handling systems.

Industrial and street lighting systems.

Rules for the safety and operation of industrial networks and devices.

Summary.

Laboratory

Introduction to industrial installations and equipment.

Resistance heating system testing.

Induction heating system test

Research analysis of the hysteresis and pulse temperature controller.

Research analysis of the ventilation system with throttle and converter control of the fan.

Testing the properties of the compressor system.

Testing the properties of a pump system with relief and converter control.

Summary of information on industrial installations and equipment.

Project

Designing of power supply systems for a selected industrial receiver.

Designing of control systems of a simple technological process.

Metody kształcenia

Lecture: conventional (multimedia) lecture, problem-solving lecture

Laboratory: laboratory exercises, work in groups

Project: project method, work with document

Efekty uczenia się i metody weryfikacji osiągnięcia efektów uczenia się

Opis efektu	Symbole efektów	Metody weryfikacji	Forma zajęć
The student is able to design a simple industrial installation, select its basic elements according to the given criteria, is aware of the need for continuous self-education in connection with technological progress		przygotowanie projektu	Projekt
The student has knowledge about the functioning of industrial systems and installations, how to power them and regulate, as well as energy consumption.		kolokwium	Wykład
The student has laboratory verified knowledge of the properties of basic industrial systems and how to control them.		wykonanie sprawozdań laboratoryjnych	Laboratorium

Warunki zaliczenia

Lecture

The condition of getting credit is obtaining positive grades from written or oral tests carried out at least once in a semester.

Laboratory

The final grade is the arithmetic average of the partial grades issued for the report of each laboratory class made by students.

Project

The final grade is the arithmetic average of the projects developed by the student during the semester.

Final grade

The final grade of the subject is determined as the arithmetic average of grades for all forms of the subject with the weight: lecture 33.3%, laboratory 33.3% and project 33.3%.

Literatura podstawowa

1. Philip Kiameh, *Electrical Equipment Handbook : Troubleshooting and Maintenance*, McGraw-Hill Professional
2. IESNA Lighting Handbook, Illuminating Engineering
3. Kochel M., Niestępski S.: Elektroenergetyczne sieci i urządzenia przemysłowe.

Literatura uzupełniająca

Uwagi

Zmodyfikowane przez dr hab. inż. Paweł Szcześniak, prof. UZ (ostatnia modyfikacja: 06-04-2022 22:33)

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