

Fundamentals of electrical power engineering - course description

General information	
Course name	Fundamentals of electrical power engineering
Course ID	06.2-WE-ELEKTP-FunoEPE-Er
Faculty	Faculty of Computer Science, Electrical Engineering and Automatics
Field of study	Electrical Engineering
Education profile	academic
Level of studies	First-cycle Erasmus programme
Beginning semester	winter term 2022/2023

Course information	
Semester	2
ECTS credits to win	5
Course type	obligatory
Teaching language	english
Author of syllabus	<ul style="list-style-type: none">dr hab. inż. Marcin Jarnut, prof. UZ

Classes forms					
The class form	Hours per semester (full-time)	Hours per week (full-time)	Hours per semester (part-time)	Hours per week (part-time)	Form of assignment
Lecture	15	1	-	-	Exam
Laboratory	30	2	-	-	Credit with grade
Project	15	1	-	-	Credit with grade

Aim of the course

To provide fundamental knowledge in subject of electrical power engineering.

Prerequisites

Physics, Circuit theory

Scope

Energy significance in present times. Energetic raw materials and energy carriers. Energetic characteristics, economy energy-consumption, energy balances.

Electrical energy production. Operation principles and types of the conventional power stations, as well as nuclear. Distributed energy production. Unconventional energy sources – wind energy.

Power networks. Construction and types of the energy networks: industry networks, transmission networks, distribution networks. Overhead and cable networks. Influence of the distributed generation on power system behavior.

Power stations: connection types, construction solutions. Distribution and measurement devices: types, principle of operation, destination. Operation of the star-point in energy networks.

Teaching methods

Lecture, laboratory exercises

Learning outcomes and methods of theirs verification

Outcome description	Outcome symbols	Methods of verification	The class form
Understands issues related to co-generation and fuzzy-co-generation methods of energy production		<ul style="list-style-type: none">an exam - oral, descriptive, test and other	<ul style="list-style-type: none">Lecture
Can set energy characteristics, energy consumption and energy balance		<ul style="list-style-type: none">an ongoing monitoring during classescarrying out laboratory reports	<ul style="list-style-type: none">Laboratory
Can use the methods and devices enabling the analysis of the properties of power system elements		<ul style="list-style-type: none">an ongoing monitoring during classescarrying out laboratory reports	<ul style="list-style-type: none">Laboratory
Has knowledge on energy raw materials and energy carriers		<ul style="list-style-type: none">an exam - oral, descriptive, test and other	<ul style="list-style-type: none">Lecture
Understands the role of energy in the modern civilization		<ul style="list-style-type: none">an exam - oral, descriptive, test and other	<ul style="list-style-type: none">Lecture

Assignment conditions

Lecture – the main condition to get a pass are sufficient marks in written or oral Exam.

Laboratory – the passing condition is to obtain positive marks from all laboratory exercises to be planned during the semester.

Recommended reading

1. Mielczarski W., Electrical energy market – selected technical and economical aspects, ARE & EP-C, Warszawa, 2000 (in Polish)
2. Arrillaga J., Watson N., Power system harmonics, John Wiley & Sons, 2003
3. Machowski J. et al., Power system dynamics and stability, John Wiley & Sons, 1997

Further reading

1. Polskie Sieci Elektroenergetyczne, Balance market regulations, Warszawa, 2001 (In Polish)

Notes

Modified by dr hab. inż. Paweł Szcześniak, prof. UZ (last modification: 06-04-2022 22:42)

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