COURSE DESCRIPTION CARD - SYLLABUS

Course name
Generation and transmission of electricity [S1Elmob1>PO1-WiPEE]

Course

Field of study
Electromobility

Year/Semester
2/3

Area of study (specialization)
–

Profile of study
general academic

Level of study
first-cycle

Course offered in
Polish

Form of study
full-time

Requirements
elective

Number of hours

Lecture
15

Laboratory classes
0

Other
0

Tutorials
0

Projects/seminars
0

Number of credit points

1,00

Coordinators

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Lecturers

Prerequisites

A student starting this course should have basic knowledge in the field of electrical engineering and electromobility.

Course objective

Introduction to the power system components and their modeling and analysis of components and operating conditions of the power system. Understanding the methods of calculating the power flow and losses as well as voltage drops in power grids.

Course-related learning outcomes

Knowledge:
1. Has theoretically underpinned general knowledge about the construction, principles of operation and operation of individual elements of the power system
2. Knows and understands the construction, principles of operation and operation of devices and installations used in the infrastructure for charging hybrid and electric vehicles
3. Knows the rules and methods of analyzing the operating states of the power system

Skills:
1. Can use models of power system components to describe their operating status
2. Can make a technical and economic analysis of the role of charging stations in the operation of power grids

Social competences:
1. Is aware of the impact of electromobility on the functioning of the power system, the need to use information (knowledge of specialists) about the power system in the field of infrastructure for charging electric vehicles
2. Understands the need to publish the impact of electromobility on the balance of the power system

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Learning outcomes presented above are verified as follows:
Lecture: assessment of knowledge and skills demonstrated on the written test. Passing threshold: 50% of the total number of points.

Programme content

Characteristics of the national power system. Analysis of the operating states of components and the power system. The role of conventional and renewable sources of electricity in the electricity generation process.

Course topics

Lecture:
Basic information about the power system, characteristics of the power system. Generation and transmission of electricity. Modeling of the power system elements, analysis of the operating states of the elements and the power system. Calculation of power flow and losses as well as voltage drops in power networks. Renewable energy sources in the power engineering. The impact of electromobility on the operation of the KSE.

Teaching methods

Lecture:
Lecture with a multimedia presentation (including: drawings, photos, animations, sound, films) supplemented with examples given on the board, lecture conducted in an interactive way with the formulation of questions to a group of students or to specific students, initiation of discussions during the lecture, taking into account various aspects presented issues, including: economic, ecological, legal, social, etc., presenting a new topic preceded by a reminder of related content, known to students from other subjects.

Bibliography

Basic
1. Markiewicz H.: Urządzenia elektroenergetyczne, WNT, Warszawa 2016.
2. Pawlik M., Strzelczyk F.: Elektrownie, WNT, Warszawa 2017
3. Kacejko P., Machowski J.: Zwarcia w systemach elektroenergetycznych. WNT, Warszawa 2002
Additional
1. A.Dobrzycki, P. Ambrozik, Analiza wpływu elektrowni fotowoltaicznej na sieć elektroenergetyczną. Poznan University of Technology Academic Journals. Electrical Engineering, vol. 89, Poznań 2017, str. 321 – 333
2. Jajczyk, J., Dobrzycki, A. , Filipiak, M. , Kurz D., Analysis of power and energy losses in power systems of electric bus battery charging stations, E3S Web Conf. 19 01027 (2017),DOI:10.1051/e3sconf/20171901027
3. Dobrzycki, A. , Filipiak, M. , Jajczyk, J. , Zasilanie układów ładowania akumulatorów autobusów elektrycznych, Poznan University of Technology Academic Journals. Electrical Engineering, vol. 92, Poznań 2017, str. 25 – 35

Breakdown of average student's workload

	Hours	ECTS
Total workload	28	1,00
Classes requiring direct contact with the teacher	15	0,50
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	13	0,50