COURSE DESCRIPTION CARD - SYLLABUS

Course name

Transmission and distribution of electric power energy

Course

Field of study

Power Engineering

Year/Semester

1/2

Area of study (specialization)

Profile of study

general academic

Level of study

Second-cycle studies

Course offered in

polish

Form of study

part-time

Requirements

compulsory

Number of hours

Lecture

10

Laboratory classes

10

Other (e.g. online)

0

Tutorials

0

Projects/seminars

0

Number of credit points

2

Lecturers

Responsible for the course/lecturer:

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Wydział Inżynierii Środowiska i Energetyki

ul. Piotrowo 3A, 60-965 Poznań

Responsible for the course/lecturer:

Prerequisites

Knowledge: Has basic knowledge of the theory of electric circuits, electromagnetic field, electric machines, high voltage techniques, power engineering, electricity generation and energy transmission.

Skills: Has the ability to effectively self-study in a field related to the chosen field of study, combining knowledge acquired in the course of previously completed subjects

Competences: Is aware of the need to expand their knowledge and competences, readiness to cooperate and cooperate in a group

Course objective

Acquainting with phenomena related to the transmission and distribution of electricity, voltage

regulation and reactive power compensation. Control of power flows in power networks. The operation of wind farms in the power system. Measures to improve system stability.

Course-related learning outcomes

Knowledge

Has detailed knowledge of the principles of construction, modeling, design and operation of the elements of the power system.

Has structured and theoretically founded knowledge in the field of information management, operational control structures, telemechanics systems.

Skills

Is able to analyze and diagnose the operation of power equipment and their components in steady and transient states.

Can formulate and test hypotheses related to the analysis of the operating states of the energy system and its components also using mathematical tools.

Social competences

Is able to think and act in a creative and entrepreneurial way, understands the need to formulate and provide the public with information and opinions on the achievements of the energy sector and branches of the economy related to it.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lectures: assessment of knowledge and skills demonstrated in the written and oral exam in the next semester.

Laboratory: tests checking the knowledge necessary to implement the problems posed in the area of laboratory tasks, assessment of knowledge and skills related to the implementation of the exercise task, evaluation of the report of the exercise.

Programme content

Lectures: Voltage regulation in transmission and distribution networks; transformer control, reactive power compensation. Control of power flows in transmission and distribution networks, series compensation, phase angle regulation transformers, series resonance systems, series FACTS devices. Wind farms in the power system. Failure and system failures. Measures to improve stability.

The laboratory includes determination of power flows, short-circuit steady states. Impact of compensation, harmonic content. Thermovision tool testing. Earth electrode measurements

Teaching methods

Lecture: multimedia presentation supplemented with examples given on the board

Laboratories: performing tests on physical or digital models

Bibliography

Basic

1. Sz. Kujszczyk (pod red.): Elektroenergetyczne układy przesyłowe, WNT, Warszawa 1997.

2. J. Machowski: Regulacja i stabilność systemu elektroenergetycznego. OWPW, Warszawa 2007.

3. Poradnik Inżyniera Elektryka . t.3. WNT, Warszawa 2005

Additional

1. Z. Kremens, M. Sobierajski: Analiza systemów elektroenergetycznych. WNT, Warszawa, 1996.

2. J.Machowski , J. Białek , J. Bumby: Power System Dynamics: Stability and Control. IEEE Wiley, 2008

Breakdown of average student's workload

	Hours	ECTS
Total workload	50	2
Classes requiring direct contact with the teacher	30	1
Student's own work (literature studies, preparation for laboratory classes, preparation for tests) [1]	20	1

[1] delete or add other activities as appropriate