



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Electrical Power Engineering

### Course

Field of study

Electrical Engineering

Area of study (specialization)

-

Level of study

Second-cycle studies

Form of study

part-time

Year/Semester

1/1

Profile of study

general academic

Course offered in

Polish

Requirements

compulsory

### Number of hours

Lecture

20

Laboratory classes

20

Other (e.g. online)

0

Tutorials

0

Projects/seminars

0

### Number of credit points

5

### Lecturers

Responsible for the course/lecturer:

dr inż. Justyna Michalak

Responsible for the course/lecturer:

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Wydział Inżynierii Środowiska i Energetyki

ul. Piotrowo 3A, 60-965 Poznań

### Prerequisites

He has knowledge of the basics of electrical engineering and power engineering. It has a basic knowledge of automation in power engineering. It has a basic knowledge of the transmission and distribution of electricity. Can pre-evaluate devices included in the power system. Is aware of the need to expand their competence. Able to work and interact in group.

### Course objective

Knowledge of modern energy technologies.

### Course-related learning outcomes

Knowledge

1. He has knowledge of the structure of the power system and its component elements



2. He has knowledge about the high-tech power systems and about the devices which are elements of the production, transmission and distribution of electricity

#### Skills

1. Can analyze the production and transmission of electricity

#### Social competences

1. Is aware of the role of the reliability of the power system for the public

2. Is aware of the responsibility for jointly implemented tasks

#### Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

##### Lecture

- assessment of the knowledge and skills listed on the written exam,
- continuous assessment for all classes (rewarding activity and quality perception).

##### Laboratory

- assessment of knowledge and skills demonstrated in the final test,
- scoring tasks sent after class.

#### Programme content

##### Lecture

Basic analyzes and regulations in the power system. Rankine's cycle. Harmful phenomena related to the transmission and distribution of energy. Modern electricity generation technologies, including: supercritical power plants and fluidized bed boilers, gas and gas-steam power plants integrated with fuel gasification technologies. Clean coal technologies in power industry: CO<sub>2</sub> capture, combustion in pure oxygen. Modern nuclear power plants. Economic and ecological aspects of new technologies.

##### Laboratory

Discussion of devices for auxiliary needs of conventional power plants and basic measuring devices. Methods of increasing the efficiency of the Rankine's cycle. Regulation of the power unit operation.

#### Teaching methods

Lecture with multimedia presentation

Laboratory: conducting laboratory exercises on positions in the laboratory

#### Bibliography



Basic

1. Kubowski J., Nowoczesne elektrownie jądrowe. WNT. Warszawa 2010
2. Skorek J., Kalina J., Gazowe układy kogeneracyjne, WNT, 2005
3. Sikorski W., Szymocha K., Urządzenia pomocnicze elektrowni parowych, Wydawnictwo Politechniki Wrocławskiej, 1981.
4. Chmielniak T., Technologie energetyczne, Wydawnictwo Politechniki Śląskiej, 2014
5. Nehrebecki L., Elektrownie ciepłone, WNT, 1974
6. Laudyn D., Pawlik M., Strzelczyk F., Elektrownie, WNT, 2005
7. Machowski J., Regulacja i stabilność systemu elektroenergetycznego, OWPW, Warszawa , 2007

Additional

1. Celiński Z., Strupczewski A., Podstawy energetyki jądrowej, WNT, 1984
2. Poradnik inżyniera elektryka, WNT, Warszawa 2009
3. Chmielniak T., Ziębik A., Obiegi ciepłone nadkrytycznych bloków węglowych. Wydawnictwo Politechniki Śląskiej. 2010
4. Kotowicz J., Elektrownie gazowo-parowe, Kaprint, 2008
5. Szczerbowski, R.(red), Energetyka węglowa i jądrowa: wybrane aspekty /Fundacja na rzecz Czystej Energii, 2017
6. Marecki J.: Podstawy przemian energetycznych, WNT Warszawa 2014
7. Lewandowski W. M.: Proekologiczne źródła energii odnawialnej, WNT, Warszawa 2012

**Breakdown of average student's workload**

	Hours	ECTS
Total workload	134	5,0
Classes requiring direct contact with the teacher	64	2,0
Student's own work (literature studies, preparation for laboratory classes, preparation for exam) <sup>1</sup>	70	3,0

<sup>1</sup> delete or add other activities as appropriate