



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Electrical Power Engineering

### Course

Field of study

Electrical Engineering

Area of study (specialization)

-

Level of study

First-cycle studies

Form of study

full-time

Year/Semester

3/5

Profile of study

practical

Course offered in

Polish

Requirements

compulsory

### Number of hours

Lecture

15

Laboratory classes

0

Other (e.g. online)

0

Tutorials

0

Projects/seminars

0

### Number of credit points

2

### Lecturers

Responsible for the course/lecturer:

dr inż. Justyna Michalak

Responsible for the course/lecturer:

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tel.616652030

Wydział Inżynierii Środowiska i Energetyki

ul. Piotrowo 3A, 60-965 Poznań

### Prerequisites

Basic knowledge of the mathematics, physics and theoretical electrotechnics and of the basic knowledge of electrical power engineering in the previous semester. Ability to effectively self-education in a field related to the chosen field of study. Is aware of the need to broaden their competence, willingness to work together as a team.

### Course objective

Learning about the construction and principles of operation of gas-fired and gas-steam power plants and combined heat and power plants. The use of renewable sources for the production of electricity. Getting to know issues related to nuclear energy.



### Course-related learning outcomes

#### Knowledge

1. Student has a general knowledge of issues relating to distributed and non-conventional energy sources
2. Student has a general knowledge of nuclear power issues.

#### Skills

1. Student can classify the electricity generation technologies and to analyze the efficiency of energy conversion occurring in different types of generation sources.
2. The student is able to analyze the process of electricity generation in various types of generation sources.

#### Social competences

1. Student understand the need to promote energy efficiency and reducing harmful effects on the environment of the electricity sector

### Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

#### Lecture

- assess the knowledge and skills listed on the written exam,
- continuous grading knowledge and skills on each lecture by discussion regarding actual problems in the electric power engineering (rewarding activity)

### Programme content

#### Lecture

Gas and gas-steam power plants and combined heat and power plants. Clean coal technologies. Organic ORC Rankine Cycle. Power plants using renewable energy sources. Fuel cells. Nuclear power plants. Construction and operation of the reactor. Types of nuclear reactors.

### Teaching methods

Lecture with multimedia presentation

### Bibliography

#### Basic

1. Pawlik M.: Strzelczyk F.: Elektrownie, Wydawnictwo WNT Warszawa 2017
2. Kubowski J.: Elektrownie jądrowe, Wydawnictwo WNT, Warszawa 2017
3. Skorek J., Kalina J.: Gazowe układy kogeneracyjne, Wydawnictwo WNT, Warszawa 2005



Additional

1. Chmielniak T.: Technologie energetyczne, Wydawnictwo WNT, Warszawa 2014
2. Marecki J.: Podstawy przemian energetycznych, Wydawnictwo WNT, Warszawa 2014
3. Lewandowski W. M.: Proekologiczne źródła energii odnawialnej, Wydawnictwo WNT, Warszawa 2012
4. Michalak J., Analiza opłacalności ekonomicznej elektrowni jądrowej, Materiały Międzynarodowej Konferencji Naukowo – Technicznej Zastosowanie Komputerów w Elektrotechnice, ZKwE, Poznań 2010.
5. Michalak J., Szczerbowski R., Wróblewski R.: Analiza porównawcza efektywności ekonomicznej wytwarzania energii elektrycznej elektrowni jądrowej i elektrowni węglowych, Konferencja Naukowo-Techniczna Zastosowania Komputerów w Elektrotechnice. XIII ZKwE, Poznań 2008.
6. Wróblewski R., Michalak J., Szczerbowski R.: The computer programme for computing the energy efficiency of the systems of gas – steam heat and power small-power plants, ss. 141-144, Electrical Engineering, Poznan University of Technology, Academic Journals, Poznań 2009.

**Breakdown of average student's workload**

	Hours	ECTS
Total workload	40	2,0
Classes requiring direct contact with the teacher	20	1,0
Student's own work (literature studies, preparation for exam) <sup>1</sup>	20	1,0

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