COURSE DESCRIPTION CARD - SYLLABUS

Course name
Energy use and conversion

Course

Field of study
Power Engineering

Year/Semester
4/7

Area of study (specialization)
Electrical Power Engineering

Profile of study
general academic

Level of study
First-cycle studies

Course offered in
Polish

Form of study
full-time

Requirements
elective

Number of hours

Lecture
30

Laboratory classes
0

Other (e.g. online)
0

Tutorials
0

Projects/seminars
15

Number of credit points

4

Lecturers

Responsible for the course/lecturer:
dr inż. Robert Wróblewski

email: robert.wróblewski@put.poznan.pl

tel. 61 665 2523

Faculty of Environmental Engineering and Energy

ul. Piotrowo 3A 60-965 Poznań

Responsible for the course/lecturer:

Prerequisites

Basic knowledge of physics, electrical engineering and work of power systems. Ability to understand and interpret the messages transmitted and effective self-education in the field related to the chosen field of study. Is aware of the expansion of their competences and readiness for individual and team work

Course objective

Understanding the phenomena associated with the transformation of energy, in particular electricity into other forms of useful and unusable energy (energy losses).

Course-related learning outcomes

Knowledge

1. Student has ordered and theoretically founded knowledge of basic technologies for converting primary energy into work, heat and electricity, knows the construction and operation of energy machines.

2. Student knows and understands the impact of energy transformation processes on the natural environment.

Skills

1. Student applies the principles of occupational health and safety, is able to assess the impact of energy on the environment.

2. Student is able to assess the energy situation and knows the principles of rational economy. Is able to assess the energy consumption of the production process.

3. Student is able to select an energy converter for a specific receiving device. Is able to assess the energy efficiency and energy quality of such a converter.

Social competences

1. The student is aware of the importance and understands the non-technical aspects and effects of the power engineering engineer, including its impact on the environment, and the associated responsibility for the decisions taken.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture:

- assessment of knowledge and skills demonstrated in writing

Laboratory classes:

- assessment based on ongoing monitoring of messages and reports made

Project:

- assessment on the basis of ongoing monitoring of the news and performance of the final work

Programme content

Lecture:

Electricity transformations in the power system, energy losses and efficiency of energy converters, energy balance. Conversion of electricity into usable energy; electro-light, electrothermal and electrochemical transformation

Laboratory classes:

examining the characteristics of the inverter and the inverter drive, examining the characteristics of light sources, measuring power and energy.

Project:

Energy efficiency in the transformation of electricity, ways to improve the energy efficiency of electricity use.

Teaching methods

Lecture: multimedia presentation, illustrated with examples on the board

Laboratory classes: classes at laboratory positions

Project: multimedia presentation,

Bibliography

Basic

1. Masny J., Teresiak Z., Przemiany energii elektrycznej. WNT. Warszawa 1985 r.

2. Adamska J., Handke A., Musierowicz K., Przemiany energii elektrycznej - przykłady obliczeniowe, Wyd.PP. Poznań 1994

Additional

1. Praca zbiorowa: Poradnik inżyniera elektryka. Tom 1. WNT. Warszawa 2009 r.

Breakdown of average student's workload

	Hours	ECTS
Total workload	110	4,0
Classes requiring direct contact with the teacher	72	3,0
Student's own work (literature studies, preparation for tests, project preparation) [1]	38	1,0

[1] delete or add other activities as appropriate