COURSE DESCRIPTION CARD - SYLLABUS

Course name

Renewable Energy Sources in Power Engineering

Course

Field of study

Power Engineering

Year/Semester

2/4

Area of study (specialization)

Profile of study

general academic

Level of study

First-cycle studies

Course offered in

polish

Form of study

full-time

Requirements

compulsory

Number of hours

Lecture

15

Laboratory classes

15

Other (e.g. online)

Tutorials

Projects/seminars

Number of credit points

2

Lecturers

Responsible for the course/lecturer:

Dr hab.inż. Grażyna Jastrzębska prof.nadzw.

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Responsible for the course/lecturer:

Prerequisites

Basic knowledge of Physics and Mathematics.

Ability to effective self education related to the chosen field of study.

Is aware of the need to expand own competences. Willingness to work in a team.

Course objective

Introduce students to the construction principles of operation and possible application of renewables.

Justification of the need of replacing the conventional energy sources with the renewables ones due to the depletion of the former and increasing environmental pollution.

Presenting of new possibilities of gaining the electric energy.

Course-related learning outcomes

Knowledge

Student has a basic knowledge of renewable energy, including wind energy, water, sun, biomass and geothermal energy. He knows and understand the phenomena, processes and devices allowing the conversion of energy from renewable sources in electricity and heat.

Versed in the current state of review energy developmentand prospective trends in Poland and around the world.

Skills

Is abble to aquire information from literature, databases and other sources, analyse it and interpret, chaw conclusions, justify opinions.

Is able to work alone and in a team, use a properly chosen methods and devices for electrical parameters and characteristics, interpret the results, draw conclusions.

Can use properly selected methods and devices in terms of parameters and electrical characteristics, interpret the obtained results, draw conclusions .

Social competences

1. Is aware of the importance and understands the impact of non-technical aspects of engineer.

2. Is aware of responsibility for the own work and ready to comply with the principles of teamwork and accountability of collaborative tasks.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture:

- Evaluate the listed knowledge and skills on the writtten exam.

- Continous evaluation (rewarding the activity and the quality perception during classes).

Lab. classes:

- Test and rewarding of the knowledge necessary to carry out the fundamental problems in the area of laboratory tasks.

Continous evaluation (during each classe) rewarding the skills gained to use newly learned principles and methods.

Evaluation of the knowledge and skills related to the laboratory task. Evaluation of the report of performed task.

Additional points for the activity, during classes, especially by:

-promoting discussion on the additional aspects of the subject.

- effective use of the knowledge gained during solving the given task.

- willingness to work in a team to solve the lab tasks.

- comments/suggestions related to the improvement of the teaching materials.

-esthetic accuracy of the reports and tasks-as a part of own study.

Programme content

1. The principle of introduction of renewable energy sources into the energy economy.

2. Characteristics of renewable energy sources (wind, water, sun, biomass, geothermal).

3. Characteristics of devices enabling the conversion of energy from RES to electricity. New Polish and foreign solutions.

4. Application possibilities in various fields, correlation theory with practice.

5. Advantages, disadvantages, limitations of such solutions, (energy supply instability, energy storage, source co-operation with the network, hybrid solutions).

6. World trends, potentates, major investments.

7. Economic, ecological and social aspects (also called "external costs").

Teaching methods

Applied methods of teaching: lecture and laboratory.

Lecture with multimedia presentation (drawings, photographs, animations and illustrations of own research). Reference to content known to students from other subjects.

Laboratory: Detailed review of the report by the instructor, analysis of the results of the measurements and discussion of the comments and conclusions of the study, team work, references to practice outside the laboratory.

Bibliography

Basic

1. Jastrzębska G.: Energia ze źródeł odnawialnych i jej wykorzystanie, WKŁ, 2017

2. Jastrzębska G.: Ogniwa słoneczne, WKŁ, 2013

3. Lewandowski W.: Proekologiczne odnawialne źródła energii, WNT, Warszawa 2012.

4. Tytko R.: Odnawialne źródła energii, OWG, 2017.

Additional

1. Praca zbiorowa Odnawialne i niekonwencjonalne źródła energii, Poradnik, Tarbonus 2008.

2. Jastrzębska G.: Odnawialne źródła energii i pojazdy proekologiczne, WNT 2009.

3. Zestaw indywidualnie tematycznie dobranych artykułów naukowych na bazie bibliografii z literatury podstawowej [1].

Breakdown of average student's workload

	Hours	ECTS
Total workload	61	2,0
Classes requiring direct contact with the teacher	35	1,0
Student's own work (literature studies, preparation for laboratory classes, preparation for tests)[1]	26	1,0

[1] delete or add other activities as appropriate