STUDY MODULE DESCRIPTION FORM

Name of the module/subject	Code
Environment protection in power engineering	**1010314471010325647**

Field of study	Profile of study (general academic, practical)	Year /Semester
Power Engineering	**(brak)**	**4 / 7**
Elective path/specialty	**Subject offered in:**	**Course (compulsory, elective)**
-	**Polish**	**obligatory**

Cycle of study:	Form of study (full-time,part-time)
First-cycle studies	**part-time**

No. of hours	No. of credits
Lecture: **15** Classes: **15** Laboratory: **-** Project/seminars: **-**	**3**

Status of the course in the study program (Basic, major, other)	(university-wide, from another field)
(brak)	**(brak)**

Education areas and fields of science and art	ECTS distribution (number and %)
technical sciences	**3 100%**
Technical sciences	**3 100%**

Responsible for subject / lecturer:

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Prerequisites in terms of knowledge, skills and social competencies:

1	**Knowledge**	Basic knowledge of electricity generation, knowledge of energy facilities included in the power system, its structure and purpose.
2	**Skills**	The ability to analyze processes of electricity generation and operation of electrical devices, taking into account environmental protection requirements.
3	**Social competencies**	Activity focused on environmental protection.

Assumptions and objectives of the course:

The aim of the course is to acquaint students with:

-principles of organizing the production of electricity and the use of facilities technologically adapted to the environment protection,

-influence of the different technologies of electricity generation on the natural environment,

-methods that allow to reduce the impact of selected technologies on the environment.

Study outcomes and reference to the educational results for a field of study

Knowledge:

1. Student should be able to identify production technologies economically justified and environmentally friendly. - [K_W03+++,K_W22]
2. Student defines emission limits for individual source of pollution. - [K_W08++]
3. Student discusses legislation related to environment protection. - [K_W22]
4. Student describes the unconventional methods of electricity generation. - [K_W24,K_W20]
5. Student describes the methods of air, water and soil pollution monitoring. - [K_W20]

Skills:

1. Student is able to perform the calculation of pollution level of the environment and interpret the results. - [K_U01]
2. Student evaluates and analyzes methods to reduce the impact of selected technologies on the environment. - [K_U10]

Social competencies:

1. Student is aware of the impact of presently used technologies of electricity generation on the natural environment. - [K_K02+]

Assessment methods of study outcomes

Lecture:
-assessment in the form of additional points during the lecture (activity, discussion),
-final test at the last class.
Exercises:
-tests carried out on exercises,
-permanent assessment in the classroom (self-reliance performing calculations).

Course description

-selected technologies of electricity generation,
-protection of atmospheric air,
-water protection methods,
-requirements concerned on reducing the excessive noise generated by energy devices,
-technologies of transport and storage of combustion waste,
-unconventional methods of electricity generation.

Basic bibliography:

1. Kucowski J., Laudyn D., Przekwas M.: "Energetyka a ochrona środowiska", WNT, Warszawa 1994.
2. Lewandowski W.: "Proekologiczne odnawialne źródła energii", WNT, Warszawa 2006.
3. Acts, Standards, Ordinance

Additional bibliography:

1. Paska J.: "Wytwarzanie energii elektrycznej", Oficyna Wydawnicza PW, Warszawa 2005.

Result of average student's workload

Activity	Time (working hours)
1. participation in the lecture	14
2. participation in consultation related with the lecture	5
3. preparation for the completion of the lecture	10
4. participation in the completion of the lecture	1
5. participation in class exercises	15
6. participation in consultation related with exercise	5
7. preparation for exercises	10
8. homework preparation	10

Student's workload

Source of workload	hours	ECTS
Total workload	70	3
Contact hours	40	2
Practical activities	0	0