STUDY MODULE DESCRIPTION FORM

Name of the module/subject **Energy security**		Code **1010314381010316136**
Field of study **Power Engineering**	Profile of study (general academic, practical) **general academic**	Year /Semester **4 / 8**
Elective path/specialty **Electrical Power Engineering**	Subject offered in: **Polish**	Course (compulsory, elective) **obligatory**
Cycle of study: **First-cycle studies**	Form of study (full-time,part-time) **part-time**	
No. of hours Lecture: **18** Classes: **-** Laboratory: **-** Project/seminars: **-**		No. of credits **3**
Status of the course in the study program (Basic, major, other) **other**	(university-wide, from another field) **university-wide**	
Education areas and fields of science and art **technical sciences** **Technical sciences**		ECTS distribution (number and %) **3 100%** **3 100%**

Responsible for subject / lecturer:

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Responsible for subject / lecturer:

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Prerequisites in terms of knowledge, skills and social competencies:

1	**Knowledge**	Basic knowledge of the bases of electrical power engineering, basics of thermal energy, energy management, and fuels and their utilization.
2	**Skills**	Ability to effectively self-education in a field related to the chosen field of study.
3	**Social competencies**	Is aware of the need to expand their competences.

Assumptions and objectives of the course:

Acquire knowledge about the shaping energy security complex systems, and acquaintance with the forecasts of changes in the energy sector in the European Union and Poland to increase the reliability of energy supply

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

Knowledge:

1. Bbasic knowledge of the risks and activities in the area of ??energy security - [K_W07+++]
2. Kknowledge about the main legal, organizational and economical regulations formative the European Union - [K_W07++]
3. Versed in the latest trends of energy development to increase energy security, in particular the introduction of BAT - [K_W20++]

Skills:

1. Able to assess the impact of energy on the environment - [K_U17++]
2. Able to analyze the current energy situation and suggest lines of action to increase energy security - [K_U20+]

Social competencies:

1. Understand the non-technical aspects and impacts associated with the operation of power, including its impact on the environment - [K_K02+]

Assessment methods of study outcomes

- evaluation of the knowledge and skills demonstrated on the basis of the current check posts and two written tests,
- continuous evaluation for each class skills and expertise by conducting discussions on current issues related to energy security.

Course description

The main objectives of European energy policy. Balanced Energy Policy. The concepts of reliability, sufficiency and security. The main groups of security threats. Instruments formative energy security. Legal, management and marketing. The European Emissions Trading Scheme. Ways to reduce CO2 emissions. Diversification of energy sources. The main objectives set out in the document "Polish Energy Policy until 2030". The production costs of electricity and heat (C02, S02). Clean Coal Technologies. Certificates of origin as instruments to promote activities that increase energy security. Energy tariffs as part of the shaping energy security. Metering and billing, and information systems. Reliability of the power grid. System failures as a feature of large complex systems. The basic principles of defense and reconstruction of power systems during states of emergency and disaster. Defenses and reconstruction generating capacity in the power system in a catastrophic failure.

Basic bibliography:

1. R.Janiczek ? Loading of power steam power plants, WNT W-wa 1990

2. Florkowska B., Diagnostics of high voltage insulating systems of power devices, Wydawnictwa AGH, Kraków, 2009

Additional bibliography:

1. Gładyś H., Matla R.: Work of power plant in electric power system. WNT. W-wa 1995

2. D.Laudyn, M.Pawlik, F.Strzelczyk ? Power plants, WNT W-wa 2000

3. M.Pawlik, J.Skierski ? Systems and devices of power station internal load. WNT W-wa 1986

4. Gacek Z., Structure of high voltage insulating systems used in electric power engineering, Wydawnictwo Politechniki Śląskiej, Gliwice, 2002

5. Florkowska B. i inni, Mechanisms, measurements and analysis partial discharges in diagnostics of high voltage insulating systems, Uczelniane Wydawnictwo Naukowo ? Dydaktyczne AGH, Kraków, 2001

Result of average student's workload

Activity	Time (working hours)
1. participation in the lectures	18
2. participation in the consulting	5
3. preparation to the tests	30

Student's workload

Source of workload	hours	ECTS
Total workload	53	3
Contact hours	23	1
Practical activities	0	0