STUDY MODULE DESCRIPTION FORM

Name of the module/subject		Code
Electrical Power Engineering		**1010322311010312426**

Field of study	Profile of study (general academic, practical)	Year /Semester
Electrical Engineering	**(brak)**	**1 / 1**
Elective path/specialty	Subject offered in:	Course (compulsory, elective)
-	**Polish**	**obligatory**

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

No. of hours				No. of credits
Lecture: **30**	Classes: **-**	Laboratory: **30**	Project/seminars: **-**	**5**

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	**5 100%**
Technical sciences	**5 100%**

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**	He has knowledge of the basics of electrical engineering and power engineering. It has a basic knowledge of automation in power engineering. It has a basic knowledge of the transmission and distribution of electricity
2	**Skills**	Can pre-evaluate devices included in the power system
3	**Social competencies**	Is aware of the need to expand their competence. Able to work and interact in group

Assumptions and objectives of the course:

Understanding the basic principles of computing power networks in normal and disturbance conditions. Knowledge of modern energy technologies.

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

Knowledge:

1. He has knowledge of the structure of the power system and its component elements - [K_W16+++]
2. He has knowledge about the high-tech power systems and about the devices which are elements of the production, transmission and distribution of electricity - [K_W19++]
3. Has knowledge of the analysis of the fundamental states of the system, the nature of local and global stability as well as a basic knowledge about the design of power lines - [K_W17++]

Skills:

1. Able to evaluate harmful events associated with the transmission and distribution of electricity - [K_U07+]
2. Can analyze the production and transmission of electricity - [K_U14++]
3. Can perform simple calculations for normal and fault conditions of the power system, determine the power and energy losses - [K_U12++]

Social competencies:

1. Is aware of the role of the reliability of the power system for the public - [K_K02++]
2. Is aware of the responsibility for jointly implemented tasks - [K_K01++]

Assessment methods of study outcomes

Lecture. Assessment of the knowledge and skills listed on the written exam, continuous assessment for all classes (rewarding activity and quality perception).

Laboratory: test and favoring knowledge necessary for the accomplishment of problems, continuous evaluation for each course - rewarding gain skills they met the principles and methods, assessment of knowledge and skills related to the implementation of laboratory exercises, the evaluation report on the performed exercise.

Get extra points for the activity in the classroom, and in particular for: propose to discuss further aspects of the subject, the effectiveness of the application of the knowledge gained during solving the given problem, ability to work within a team practice performing the task detailed in the laboratory, subsequent to the improvement of teaching materials, developed aesthetic diligence reports and tasks in the self-study.

Course description

Power Grids. Systems and their configurations. Basic analysis and regulation of the power system. Distribution of power in the network hub. The issue of local and global stability. Practical methods for calculating power and energy losses. General information about the design of overhead lines. Harmful events associated with the transmission and distribution of energy. Electrochemical corrosion of underground metal devices.

Modern power generation technologies, including: supercritical power plants and fluidized bed boilers, gas-fired and gas-steam power plants integrated with fuel gasification technology. Clean coal technologies in power generation: CO2 capture, combustion in pure oxygen. Modern nuclear power plants. Economic and environmental aspects of new technologies.

Adjusting the frequency and power exchange, primary, secondary and tertiary regulation. Organization regulations and requirements placed on it. Regulatory processes, the principle of non-intervention in the regulation of secondary. Reactive power compensation in HV and LV networks, batteries, capacitors, FACTS devices, the role of wind farms.

Basic bibliography:

1. Kujszczyk Sz. (pod red.): Elektroenergetyczne układy przesyłowe, WNT, Warszawa, 1997

2. Kujszczyk Sz. (pod red.): Elektroenergetyczne sieci rozdzielcze, WNT, Warszawa, 2004

3. Adamska J., Niewiedział R.: Podstawy elektroenergetyki. Sieci i urządzenia elektroenergetyczne. Skrypt P.P., Nr 1519, Poznań 1989

4. Handke A., Sieci elektroenergetyczne. Szkodliwe zjawiska towarzyszące przesyłaniu i rozdzielaniu energii elektrycznej. Wydawnictwo Politechniki Poznańskiej, Poznań 1987

5. Kulczycki J. (pod red.): Ograniczanie strat energii elektrycznej w elektroenergetycznych sieciach rozdzielczych. PTPiREE Poznań 2002

6. PN-EN 50341-3-22 Elektroenergetyczne linie napowietrzne prądu przemiennego powyżej 45 kV. Normatywne warunki krajowe dla Polski. 2009

7. Kubowski J.: Nowoczesne elektrownie jądrowe. WNT. Warszawa 2009

8. Skorek J., Kalina J., Gazowe układy kogeneracyjne, WNT, 2005

9. Kotowicz J., Elektrownie gazowo-parowe, Kaprint, 2008

10. Chmielniak T., Technologie energetyczne, Wydawnictwo Politechniki Śląskiej, 2004

11. Nehrebecki L., Elektrownie cieplne, WNT, 1974

12. Laudyn D., Pawlik M., Strzelczyk F., Elektrownie, WNT, 1990

13. Machowski J.: Regulacja i stabilność systemu elektroenergetycznego, OWPW, Warszawa , 2007

Additional bibliography:

1. Celiński Z., Strupczewski A., Podstawy energetyki jądrowej, WNT, 1984

2. Popczyk J., Elektroenergetyczne układy przesyłowe, Wydawnictwo Politechniki Śląskiej, Gliwice 1984

3. Poradnik inżyniera elektryka, WNT, Warszawa 2009

4. Chmielniak T., Ziębik A., Obiegi cieplne nadkrytycznych bloków węglowych. Wydawnictwo Politechniki Śląskiej. 2010

Result of average student's workload

Activity	Time (working hours)
1. participation in lectures	30
2. exam preparation	20
3. presence on the exam	5
4. the consultation of lectures	5
5. participation in laboratory	30
6. preparation to laboratory exercises	20
7. development of laboratory reports	20
8. the consultation of the laboratory	5

Student's workload

Source of workload	hours	ECTS

Total workload	135	5
Contact hours	75	3
Practical activities	70	3