STUDY MODULE DESCRIPTION FORM

Name of the module/subject		Code
Transfer and distribution of electric energy		**1010315431010313675**

Field of study	Profile of study (general academic, practical)	Year /Semester
Power Engineering	**(brak)**	**2 / 3**
Elective path/specialty	Subject offered in:	Course (compulsory, elective)
Electrical Power Engineering	**Polish**	**obligatory**

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

No. of hours					No. of credits
Lecture: **5**	Classes: **-**	Laboratory: **10**	Project/seminars: **-**		**2**

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	**2 100%**
Technical sciences	**2 100%**

Responsible for subject / lecturer:

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Prerequisites in terms of knowledge, skills and social competencies:

1	**Knowledge**	Possesses basic knowledge of the theory of electrical circuits, electromagnetic field, electrical machines, High voltage techniques, electric power engineering and electrical power generation
2	**Skills**	Has effective self-study ability in the domain of the chosen field of studies, is able to integrate the knowledge acquired at the credited courses
3	**Social competencies**	Is aware of the need to develop his knowledge and competencies, is ready to undertake the cooperation and team work

Assumptions and objectives of the course:

Getting knowledge of the phenomena related to the electric power transmission and distribution, voltage regulation and reactive power compensation, power flow control in the electric power grid, practice in operation and use of the DAKAR program in the scope of the analysis of the power system steady operation conditions.

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

Knowledge:

1. Has detailed knowledge of the rules of construction, modeling, designing, operation and maintenance of the electric power system elements, - [K_W04 ++]
2. Has ordered knowledge of the electric, electronic and power electronic circuits theory as well as of the signal theory and signal processing techniques - [K_W17++]

Skills:

1. Can use acquired mathematical methods and models as well as the computer simulation to discuss and assess the operation of the electric power elements and systems - [K_U07 ++]
2. Can use properly chosen techniques and devices for measuring basic magnitudes describing power elements and systems - [K_U10++]

Social competencies:

1. Understands the need and knows opportunities of the continuous studies (second and third cycle studies, post-diploma, courses) - improving professional skills, personal and social - [K_K01 ++]

Assessment methods of study outcomes

Lectures:

1. Assesment of the knowledge and skills shown at the written and oral examinations ,
2. Continuous assessment during courses (bonus for activity and perception quality).

Laboratory:

1. Test of the knowledge necessary to deal with problems posed in the lab tasks.
2. Assessment of the knowledge and skills related to the lab task completion. Assessment of the task report.

Course description

Lectures: Power flow control in the transmission and distribution networks, wind power stations? operation in the electric power system, stability enhancement means.

Laboratory involves experiments carried out using the DAKAR program, in the scope of the transient states in the transmission and distribution networks of the electric power system described during lectures

Basic bibliography:

1. Sz. Kujszczyk (pod red.): Elektroenergetyczne układy przesyłowe, WNT, Warszawa 1997.
2. J. Machowski: Regulacja i stabilność systemu elektroenergetycznego. OWPW, Warszawa 2007.
3. Poradnik Inżyniera Elektryka . t.3. WNT, Warszawa 2005

Additional bibliography:

1. Z. Kremens, M. Sobierajski: Analiza systemów elektroenergetycznych. WNT, Warszawa, 1996.
2. J.Machowski , J. Białek , J. Bumby: Power System Dynamics: Stability and Control. IEEE Wiley, 2008.

Result of average student's workload

Activity	Time (working hours)
1. participation in lecture courses	5
2. participation in labs	10
3. participation in discussions related to lectures	5
4. participation in discussions related to labs	5
5. preparation to labs	10
6. lab reports? elaboration	10
7. preparation to examination	10
8. taking an examination	3

Student's workload

Source of workload	hours	ECTS
Total workload	58	2
Contact hours	28	1
Practical activities	30	1