STUDY MODULE DESCRIPTION FORM

Name of the module/subject	Code
Distribution systems and electrical installations	**1010311461010306982**

Field of study	Profile of study (general academic, practical)	Year /Semester
Power Engineering	**(brak)**	**3 / 6**
Elective path/specialty	**Subject offered in:**	**Course (compulsory, elective)**
Electrical Power Engineering	**Polish**	**obligatory**

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

No. of hours	No. of credits
Lecture: **30** Classes: **-** Laboratory: **15** Project/seminars: **15**	**4**

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 %)

Responsible for subject / lecturer:

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Prerequisites in terms of knowledge, skills and social competencies:

1	**Knowledge**	Fundamentals of the electrical devices and measuring equipment and ots application. Knowledge. Knowledge of the single- and three-phase AC systems and the electric power distribution system?s structure.
2	**Skills**	Ability to acquire information from the literature in the field and other sources and to analyze it in evaluative way. Ability to deal with the analytical, simulation and experimental tools. 1c. Has understanding of the aspects and effects of the engineer?s responsibility for made decisions. Is able to work in the team.
3	**Social competencies**	Has basic knowledge of the construction solutions, parameters and choice criterions of electric power switches, MV switchgears, bus bars and bus ducts. Is able to construct the test networks and to carry out the electric power devices tests.

Assumptions and objectives of the course:

Getting knowledge about the MV and LV electric power supply and distribution systems and the LV electrical installation elements. Is familiar with construction , techniques and design-aiding programs related to the distribution network elements, electrical installations and legal regulations in force referring to its accomplishment

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

Knowledge:

1. Has elementary knowledge of the electric power engineering fundaments as well as the electric power systems and networks. - [K_W11 +++]

2. Has basic knowledge of electric power devices? diagnostics, protection methods, knows and understands the measuring methods for basic magnitudes describing the different type electrical and mechanical devices and systems. - [K_W19 ++]

3. Knows the calculation techniques and IT tools necessary to analyze the experimental results. - [K_W19 ++]

Skills:

1. Is able to acquire information from the literature in the field , databases and other sources; can integrate, interpret and conclude it and to formulate and proof the opinions.. - [K_U01 +++]

2. Can apply the acquired mathematical methods and models as well as computer simulations to analyze and evaluate the operation of electric power elements and systems. - [K_U07 ++]

Social competencies:

1. Is aware of the importance and has understanding of the non-technical aspects and effects of the electric power engineer including the influence on the environment and resulting responsibility for the decisions made. - [K_K02 ++]

Assessment methods of study outcomes

Lecture:

?Assessment of the knowledge and skills during the problem-type written examination,

?Continuous assessment, at each class (bonus for activity and perception quality).

Laboratory:

?Test and bonus for a knowledge necessary to accomplish the problems posed in the lab task area,

?Assessment of the knowledge and skills related to the class task accomplishment, assessment of the lab report.

Projects:

?Test and bonus for a knowledge necessary to accomplish the design task,

?Assessment of the knowledge and skills related to the design task accomplishment.

Adding extra points for activity in discussions, especially for:

?effectiveness of implementation of the knowledge acquired when solving a given problem.

?ability to cooperate in the team accomplishing in practice a specific task in lab.

?remarks related to the educational materials? enhancement,

?care and esthetic form of the elaborated lab reports and designs ? within the individual work.

Course description

MV an LV Power supply and distribution systems. Requirements on the power supply certainty and reliability as well as power supply systems. Components, construction solutions and principles of the distribution networks construction and design. Finding the power flow and energy losses, choice of the conductors in the overhead and cable lines and electric apparatus. Legal rules and conditions related to the overhead and cable line accomplishment. LV network systems. LV electric power switches Electric installation components. Electric power conductors and cables, current-carrying continuous capacity, cross-section calculations, voltage drops, over-current protections.

Laboratory and projects subjects are related to those presented during lectures.

Basic bibliography:

1. Markiewicz H.: Urządzenia elektroenergetyczne, WNT, Warszawa, 2001.
2. Periodyki: Elektroinstalator, Elektroinfo
3. Katalogi firmowe i informacje internetowe
4. Mejro C., Podstawy gospodarki energetycznej, WNT, 1980
5. Niedziółka D., Rynek energii w Polsce, Difin, 2010
6. Soliński I., Ekonomia i organizacja sektorów systemu paliwowo-energetycznego. Uczelniane Wydawnictwa Naukowo-Dydaktyczne. 2000
7. Górzyński J., Audyting energetyczny. NAPE S.A. 2002
8. Laudyn D., Rachunek ekonomiczny w elektroenergetyce, Oficyna Wydawnicza Politechniki Warszawskiej, 1997
9. Góra S., Gospodarka elektroenergetyczna, Wydawnictwo Uczelniane politechniki Poznańskiej, 1973
10. Pawlęga A. Rachunek ekonomiczny w elektroenergetyce. Oficyna Wydawnicza Politechniki Warszawskiej, 2011
11. Charun H., Podstawy gospodarki energetycznej. Wydawnictwo Uczelniane Politechniki Koszalińskiej. 2007
12. Ziębik A., Szargut J., Podstawy gospodarki energetycznej, Wyd. Politechniki Śląskiej, 1997
13. Markiewicz H.: Urządzenia elektroenergetyczne, WNT, Warszawa, 2001
14. Markiewicz H.: Instalacje elektryczne, WNT, Warszawa, 1996, 2000.
15. Prawo Energetyczne, Prawo Budowlane.
16. Przepisy eksploatacji urządzeń elektroenergetycznych, WEMA Warszawa, 1996.
17. Markiewicz H.: Urządzenia elektroenergetyczne, WNT, Warszawa, 2001
18. Markiewicz H.: Instalacje elektryczne, WNT, Warszawa, 1996, 2000.
19. Prawo Energetyczne, Prawo Budowlane.
20. Przepisy eksploatacji urządzeń elektroenergetycznych, WEMA Warszawa, 1996.

Additional bibliography:

1. Szargut J., Ziebik A., Podstawy energetyki cieplnej, PWN
2. Kuciński K., Energia w czasach kryzysu, DIFIN, 2006
3. Magazins Elektroinstalator, Elektroinfo.
4. Related standards.
5. Manufacturers? data sheets.
6. Internet publications
7. Magazins Elektroinstalator, Elektroinfo.
8. Related standards.
9. Manufacturers? data sheets.
10. Internet publications

Result of average student's workload

Activity	Time (working hours)
1. Lectures	30
2. Laboratory	15
3. Projects	15
4. Part in consultations	30
5. The preparation to occupations, the study of laboratory documentation	35

Student's workload		
Source of workload	**hours**	**ECTS**
Total workload	125	4
Contact hours	90	2
Practical activities	70	2