STUDY MODULE DESCRIPTION FORM

Name of the module/subject	Code
Fundamentals of electricity and electronics	**1010311411010325572**

Field of study	Profile of study (general academic, practical)	Year /Semester
Power 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)
First-cycle studies	**full-time**

No. of hours	No. of credits
Lecture: **30** Classes: **-** 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 information form mathematics and physics at level of High School.
2	**Skills**	Skills in understanding and interpretation of information and effective self-education in field of science related with chosen academic discipline.
3	**Social competencies**	Student should have consciousness of necessity of improving his competences, readiness to work individual and cooperate within groups.

Assumptions and objectives of the course:

Introduction of physical quantities and basic laws and theorems in the field of electric engineering and electronics in direct current circuits, one- and three-phase alternating current circuits. Introduction of analytical methods of calculations for electric circuits and rules of connection and carrying on measurements.

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

Knowledge:

1. describe electric and electronic circuits, describe and explain laws and methods of analysis of direct current circuits, one- or three-phase alternating current circuits, magnetic coupled circuits - [K_W01++, K_W02++, K_W17+++]
2. recognize and select methods of analysis and testing of electrical circuits - [K_W01++, K_W02++]

Skills:

1. use knowledge in field of theory of electric and electronic circuits, necessary to determine parameters of circuits, such as : voltage, current, impedance, power, energy etc. - [K_U01++, K_U02++, K_U06+, K_U10++]
2. get information from literature and web, work individual, solve exercises by his own, connect and carry on measurements of electric values in field of basic electrical engineering - [K_U01++, K_U02++, K_U06+, K_U10++]

Social competencies:

1. think and operate in enterprising way in the field of analysis of electric circuits - [K_K01+, K_K02+, K_K04+]

Assessment methods of study outcomes

Lecture:

- assess the knowledge and skills listed on the written and oral exam of basics of electrical engineering and electronics.

Obtaining additional points for activity during exercises, in particular way for:

- proposing to discuss additional aspects of the subject,
- comments related to improve teaching material.

Course description

Electric signals and classification, basic definitions in field of electrical engineering, elements of electric circuits, arrow convention for the voltage and the current, electric circuits laws, methods of analysis of direct current circuits and one- and three-phases alternating current circuits (Kirchhoff?s laws, Mesh-Current Method, Node-Voltage Method), circuits theorems: Norton?s theorem, Thevenin?s theorem, Tellegen?s theorem), real power, reactive power an complex power, energy in electric circuits, maximum power transfer theorem, magnetic coupled circuits, resonance effect, measurements of power and energy in electric circuits Solving accounting tasks in field of analysis of direct current circuits, one- and three-phase alternating current circuits.

Basic bibliography:

1. Kurdziel R.: "Podstawy elektrotechniki", WNT, Warszawa 1973.
2. Bolkowski S.: "Teoria obwodów elektrycznych", WNT, Warszawa 1998.
3. Szabatin J., Śliwa E.: "Zbiór zadań z teorii obwodów. Część 1", Wydawnictwo Politechniki Warszawskiej, Warszawa 1997.
4. Mikołajuk K., Trzaska Z.: "Zbiór zadań z elektrotechniki teoretycznej", WNT, Warszawa 1978.
5. Frąckowiak J., Nawrowski R., Zielińska M.: "Podstawy elektrotechniki. Laboratorium", Wydawnictwo Politechniki Poznańskiej, Poznań 2011.

Additional bibliography:

1. Krakowski M.: "Elektrotechnika teoretyczna", PWN, Warszawa 1978.
2. Chua L. O., Desoer C. A., Kuh E. S.: "Linear and nonlinear circuits", McGraw-Hill Inc., New York 1987.
3. Jastrzębska G., Nawrowski R.: "Zbiór zadań z podstaw elektrotechniki", Wydawnictwo Politechniki Poznańskiej, Poznań 2000.

Result of average student's workload

Activity	Time (working hours)
1. participation in the lectures	30
2. participation in consultations on the lecture	8
3. preparation for the exam	30
4. participation in the exam	2

Student’s workload

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