

STUDY MODULE DESCRIPTION FORM		
Name of the module/subject Fundamentals of electricity and electronics		Code 1010311411010325572
Field of study Power Engineering	Profile of study (general academic, practical) general academic	Year /Semester 1 / 1
Elective path/specialty -	Subject offered in: Polish	Course (compulsory, elective) obligatory
Cycle of study: First-cycle studies	Form of study (full-time, part-time) full-time	
No. of hours Lecture: 30 Classes: - Laboratory: - Project/seminars: -		No. of credits 4
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 %) 100 4% 100 4%
Responsible for subject / lecturer: dr inż. Krzysztof Budnik email: krzysztof.budnik@put.poznan.pl tel. 616652788 Elektryczny ul. Piotrowo 3A, 60-965 Poznań		
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		

<p>Lecture:</p> <ul style="list-style-type: none"> - assess the knowledge and skills listed on the written and oral exam of basics of electrical engineering and electronics. <p>Obtaining additional points for activity during exercises, in particular way for:</p> <ul style="list-style-type: none"> - proposing to discuss additional aspects of the subject, - comments related to improve teaching material. 		
Course description		
<p>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.</p> <p>Applied methods of education:</p> <p>The lecture with multimedia presentation, including drawings, photographs, animations, films, supplemented with examples given on the whiteboard, taking into account various aspects of the presented issues, including: economic, ecological, legal, social and practical examples known to students in everyday life, presentation of material in association with other objects.</p>		
<p>Basic bibliography:</p> <ol style="list-style-type: none"> 1. Bolkowski S.: Teoria obwodów elektrycznych, WNT, Warszawa 1998. 2. Kurdziel R.: Podstawy elektrotechniki, WNT, Warszawa 1973. 3. Szabat 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. 		
<p>Additional bibliography:</p> <ol style="list-style-type: none"> 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		15
3. preparation for the exam		40
4. participation in the exam		2
Student's workload		
Source of workload	hours	ECTS
Total workload	87	4
Contact hours	47	2
Practical activities	0	0