

STUDY MODULE DESCRIPTION FORM		
Name of the module/subject Electrical Engineering		Code 1010331121010320027
Field of study Control Engineering and Robotics	Profile of study (general academic, practical) (brak)	Year /Semester 1 / 2
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: 3 Classes: 2 Laboratory: - Project/seminars: -		No. of credits 7
Status of the course in the study program (Basic, major, other) (brak)		(university-wide, from another field) (brak)
Education areas and fields of science and art technical sciences Technical sciences		ECTS distribution (number and %) 7 100% 7 100%
Responsible for subject / lecturer: dr inż. Piotr Czarnywojtek email: piotr.czarnywojtek@put.poznan.pl tel. 6652838 Wydział Elektryczny ul. Piotrowo 3A 60-965 Poznań		
Prerequisites in terms of knowledge, skills and social competencies:		
1	Knowledge	Basic knowledge of mathematics and physics.
2	Skills	Ability to use literature, solving linear equations, ability to operate on complex numbers.
3	Social competencies	Ability to work in a team, attention to improving their own competence.
Assumptions and objectives of the course: Theoretical and practical knowledge of electrical problems. Acquire the skills to analyze selected electrical circuits for AC and DC.		
Study outcomes and reference to the educational results for a field of study		
Knowledge:		
1. He has ordered knowledge of the theory of electrical circuits and electrical DC and AC circuits, including the three-phase. - [K_W08 +++]		
2. It has a basic knowledge of the theory of signals and information processing methods in the field of time and frequency. - [K_W05 +]		
Skills:		
1. He can use the basic methods of signal processing and analysis in the time domain and frequency and extract information in the analyzed signals. - [K_U19 +++]		
2. Able to work independently and in a team, is able to estimate the time needed to carry out the tasks commissioned. - [K_U02 ++]		
Social competencies:		
1. Understand the effects of non-technical aspects and engineering activities including its impact on the environment and the associated responsibility for decisions. - [K_K02 ++]		
Assessment methods of study outcomes		

<p>Lecture: - assess the knowledge and skills listed on the written exam of a problematic.</p> <p>Exercises auditorium: - tests and tests in writing (colloquia: 7, 14 week semester), - keep rewarding activity and creativity in solving the set tasks.</p>		
Course description		
<p>Lecture: Basic concepts of electric circuit, mathematical models of electric circuit components, basic laws of the electromagnetic field, rules for determining the voltage and current, circuitry law, solving DC circuits. The method of loop currents and of nodal, Thevenin and Norton's theorems, energy and electrical power, instantaneous value, average and RMS current and voltage. Sinusoidal alternating current circuits. The method of complex numbers, Vector charts, active, reactive and apparent power, RLC circuit analysis, correction the power factor, resonance voltages and currents, transients in electrical circuits, three-phase circuits, circuits with non-sinusoidal periodic waveforms, networks and filters.</p> <p>Exercises auditorium: Solving the basic tasks of the current circuits using laws, theorems and methods of peripheral, power calculation circuit, balance of power, calculation of meter indications. Solving the RLC circuit with sinusoidal excitations - symbolic method, calculate active, reactive and apparent power, calculation circuitry capable of resonance voltages and currents. Solving circuits in transient states - classical method. Solving three-phase circuits, power calculation - Aron measuring system.</p>		
<p>Basic bibliography:</p> <ol style="list-style-type: none"> 1. Bolkowski S., Elektrotechnika teoretyczna, Wyd. 6, WNT, Warszawa 2001. 2. Kurdziel R.: Podstawy elektrotechniki, WNT, Warszawa 1973. 3. Czarnywojtek P., Kozłowski J., Machczyński W.: Zbiór zadań z podstaw elektrotechniki, Wydawnictwo PWSZ, Kalisz, 2007. 		
<p>Additional bibliography:</p> <ol style="list-style-type: none"> 1. Krakowski M.: Elektrotechnika teoretyczna. Tom 1. Obwody liniowe i nieliniowe?, PWN, Warszawa 1995. 2. Bolkowski S., Brociek W., Rawa H.: Teoria obwodów elektrycznych. Zadania, WNT, Warszawa 1995. 		
Result of average student's workload		
Activity		Time (working hours)
1. participation in class lectures		45
2. participated in exercises auditorium		30
3. participate in the consultations		10
4. exam preparation		35
5. participation in the exam		5
6. preparation for colloquia		40
Student's workload		
Source of workload	hours	ECTS
Total workload	165	7
Contact hours	90	3
Practical activities	0	0