

STUDY MODULE DESCRIPTION FORM		
Name of the module/subject Circuits theory		Code 1010321321010320173
Field of study Electrical Engineering	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: 30 Classes: 30 Laboratory: 30 Project/seminars: -		No. of credits 8
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 %) 8 100% 8 100%
Responsible for subject / lecturer: dr hab. inż. Andrzej Tomczewski email: andrzej.tomczewski@put.poznan.pl tel. 616652388 Elektryczny ul. Piotrowo 3A, 60-965 Poznań		
Prerequisites in terms of knowledge, skills and social competencies:		
1	Knowledge	Rudimentary knowledge in mathematics, physicses and of bases of electrotechnology.
2	Skills	Ability of understanding and interpreting the knowledge handed over on classes. Ability of the effective self-education in the field associated with chosen subject.
3	Social competencies	Awareness of the need to expand its competence, readiness to undertake the cooperation in frames of the team.
Assumptions and objectives of the course: Improving knowledge about sinusoidal and nonsinusoidal alternating current analysis methods. Gaining knowledge about the classical method of transient analysis for RLC linear systems. Developing knowledge about the calculation methods for nonsinusoidal periodic electric currents. Understanding the theory of passive two port networks and filters.		
Study outcomes and reference to the educational results for a field of study		
Knowledge: 1. to characterize principles of the modelling of elements and electric circuits in equilibria and transient - [K_W01++, K_W03++] 2. to explain the principle of the district modelling any linear of electromagnetic and electromechanical devices - [K_W03++, K_W04+++]		
Skills: 1. to apply the knowledge in the scope of the theory of electric circuits essential to determine significant electromagnetic parameters - [K_U02++, K_U03+, K_U19+] 2. to obtain information from literature and the Internet, to work independently, independently to solve problems from the scope of the theory of analysis and the modelling of electric circuits - [K_U02++, K_U03+]		
Social competencies: 1. is able to think and to operate in the enterprising way in the area of analysis of electric circuits - [K_K01+, K_K02++]		
Assessment methods of study outcomes		

<p>Lecture: ? the evaluation of the knowledge and abilities of electric circuits demonstrated on a written exam from the theory.</p> <p>Lecture exercises: ? assessing of the ability solving of arithmetic assignments on the scope of analysis electric circuits - checking the ability on every classes and 2 tests in the course of the semester.</p> <p>Laboratory exercises: ? the test and awarding a bonus to the essential knowledge of problems for the accomplishment stated in the given area of laboratory tasks, ? evaluation of the knowledge and the abilities associated with the performance of a task exercise.</p> <p>Getting additional points for the activity during classes, particularly too: ? proposing discussing of aspects of the issue, ? effectiveness of applying the acquired knowledge while solving a set problem, ? of the attention associated with improving teaching materials, ? aesthetic care of reports drawn up and tasks - in the framework of the own learning.</p>	
Course description	
<p>Method of symmetrical components. Linear electric circuits with periodic electricities deformed in the equilibrium (the use of a Fourier series, powers, analysis methods). Classic method analyses of transitional states in linear arrangements (the comutation rights, the initial conditions, the transient and set components, a fixed time constant). Two port networks (equations, types, ways to connect)and passive filters of LC and RC types (construction, parameters, types, frequency characteristics, application. Solving calculation tasks related to the analysis of electrical circuits with nonsinusoidal periodic electric current, transient states and determining parameters of passive two port network parameters.</p> <p>Applied methods of education: Lectures - Lecture with multimedia presentations (including: drawings, photos, animations, videos) supplemented by examples given on the board; having regard to (taking into account) the various aspects of the presented issues, including: economic, environmental, legal and social; presenting a new topic preceded by a reminder of related content, known to students from other subjects, Exercises - solving sample tasks on the board, initiating discussion about solutions, Laboratory - instructors detailed review of the reports and discussions about comments , demonstrations, work in teams.</p>	
Basic bibliography:	
<ol style="list-style-type: none"> 1. Bolkowski S.: Teoria obwodów elektrycznych, WNT, Warszawa 1998. 2. Chua L. O., Desoer C. A., Kuh E. S.: Linear and nonlinear circuits, McGraw-Hill Inc., New York 1987. 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. 	
Additional bibliography:	
<ol style="list-style-type: none"> 1. Krakowski M.: Elektrotechnika teoretyczna, PWN, Warszawa 1973. 2. Jastrzębska G., Nawrowski R.: Zbiór zadań z podstaw elektrotechniki, Wydawnictwo Politechniki Poznańskiej, Poznań 2000. 3. Frąckowiak J., Nawrowski R., Zielińska M.: Podstawy elektrotechniki. Laboratorium, Wydawnictwo Politechniki Poznańskiej, Poznań 2011. 	
Result of average student's workload	
Activity	Time (working hours)
1. participation in lectures	30
2. participation in laboratory classes	30
3. participation in exercise classes	30
4. participation in consulting (lectures)	8
5. participation in consulting (exercise)	8
6. participation in consulting (laboratory)	8
7. preparation to test/exam	35
8. test/exam	2
9. preparation for the laboratory and preparation of the report	25

Student's workload		
Source of workload	hours	ECTS
Total workload	197	8
Contact hours	122	4
Practical activities	70	2