STUDY MODULE DESCRIPTION FORM

Name of the module/subject			Code
Circuits theory			**1010324311010320173**
Field of study	Profile of study (general academic, practical)		Year /Semester
Electrical 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	**part-time**		
No. of hours			No. of credits
Lecture: **20** Classes: **20** Laboratory: **-** Project/seminars: **-**			**5**
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			**5 100%**
Technical sciences			**5 100%**

Responsible for subject / lecturer:

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Prerequisites in terms of knowledge, skills and social competencies:

1	**Knowledge**	Basic information form math 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 values and basic laws and theorems in the field of theory of direct current circuits and one- or three-phases alternating current circuits. Introduction of techniques of electric circuits analysis.

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 techniques of analysis of the electric circuits, such as: direct current circuits, one- and three-phase alternating current circuits, magnetic coupled circuits - [K_W04+++, K_W01++, K_W03++]

2. recognize and select methods of electric circuits analysis - [K_W04+++, K_W01++]

Skills:

1. use knowledge in range of theory of circuits, necessary to determine parameters of circuits, such as : voltage, current, impedance, power, energy etc. - [K_U05+++, K_U11++, K_U23+]

2. get information from literature and web, work individual, solve exercises in the field of theory of the electric circuits - [K_U05++, K_U11+]

Social competencies:

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

Assessment methods of study outcomes

Lecture:

- assess the knowledge and skills listed on the written and oral exam of the theory of circuits.

Auditorium exercises:

- assess skills of solving accounting exercises in range of analysis of electric and electronic circuits ? verification skills on every exercises and two tests during the semester.

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

- proposing to discuss additional aspects of the subject,
- effective use of knowledge obtained during solving of given problem,
- comments related to improve teaching material,
- aesthetics of solved problems and reports ? within homework.

Course description

Electric signals and classification, basic definitions in field of circuits with lumped parameters and circuits with distributed parameters, elements of electric circuits, arrow convention for voltage and 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, alternating current circuits.

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.

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.

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	20
2. participation in the auditorium exercises	20
3. prepare for the completion of the lecture	10
4. participation in consultations on the auditorium exercises	10
5. preparation for the auditorium exercises	10
6. homeworks	20
7. preparation for the exam	30
8. preparation for the auditorium exercises pass	20
9. participation in the exam	5

Student’s workload

Source of workload	hours	ECTS
Total workload	145	5
Contact hours	65	2
Practical activities	0	0