

DESCRIPTION OF THE COURSE OF STUDY

Course code	0719-2ID-C16-PEiE	
Name of the course in	Polish	Podstawy elektrotechniki i elektroniki
	English	Fundamentals of electrical engineering and electronics

1. LOCATION OF THE COURSE OF STUDY WITHIN THE SYSTEM OF STUDIES

1.1. Field of study	Data engineering
1.2. Mode of study	full-time study
1.3. Level of study	engineering studies
1.4. Profile of study*	general academic
1.5. Person/s preparing the course description	dr hab. Dariusz Banaś, prof. UJK
1.6. Contact	d.banas@ujk.edu.pl

2. GENERAL CHARACTERISTICS OF THE COURSE OF STUDY

2.1. Language of instruction	English
2.2. Prerequisites*	none

3. DETAILED CHARACTERISTICS OF THE COURSE OF STUDY

3.1. Form of classes	Lecture 30h, Laboratory 60h	
3.2. Place of classes	Courses in the teaching rooms of UJK	
3.3. Form of assessment	Exam; Credit with grade	
3.4. Teaching methods	Information lecture, Laboratory method (experiment)	
3.5. Bibliography	Required reading	Darren Ashby, Electrical Engineering, Newnes Andy Cooper, Practical Electronics: A Complete Introduction, Teach Yourself
	Further reading	Basic Electricity: Complete Course, Volume 1-5, Prompt Publications

4. OBJECTIVES, SYLLABUS CONTENT AND INTENDED TEACHING OUTCOMES

4.1. Course objectives
C1 - Acquainting with the laws governing the flow of direct and alternating current,
C2 - Acquainting with the physical fundamentals of the operation of semiconductor devices
C3 - Acquainting with the construction and principle of operation of basic systems and electrical devices and electronic
C4 - Acquiring the ability to recognize and analyze simple electrical circuits
C5 - Acquiring the ability to design and build simple electrical and electronic circuits
4.2. Detailed syllabus
Lecture
Basics of electricity and magnetism
Direct and alternating current
Basic electrotechnical equipment
Basic laws of electrical circuits
Basic methods of electric circuit analysis
Analysis of circuit with RLC elements. Resonance in electrical circuits
Current in solids. Band model
Physical fundamentals of the operation of semiconductor devices, p-n junction
Basic semiconductor devices, models of semiconductor components
Integrated circuits
Basic electronic circuits, amplifiers, generators
Basic digital circuits, flip-flops and counters, semiconductor memories, microprocessor systems
Laboratory
1. Ohm's Law
2. Kirchhoff's Laws

3. Principle of Reciprocity and Superposition
4. Real Source. Matching the Load to the Source
5. Thevenin's Theorem
6. Norton's Theorem
7. Study of a Semiconductor Diode
8. Real Inductor
9. RLC Elements. Voltage Resonance
10. Filters
11. Study of a Transistor Voltage Amplifier

4.3 Intended learning outcomes

Code	A student, who passed the course	Relation to teaching outcomes
within the scope of KNOWLEDGE:		
W01	defines basic electrical quantities, gives basic laws governing the flow of direct and alternating current	ID1A_W03 ID1A_W04 ID1A_W05
W02	knows the basic active and passive elements of electrical systems, the principles of their operation in circuits of direct and alternating current, and basic methods of calculating circuits	ID1A_W03 ID1A_W04 ID1A_W05
W03	describes the principles of operation of basic electrotechnical equipment	ID1A_W03 ID1A_W04 ID1A_W05
W04	describes the physical principles of the operation of semiconductor devices and their tasks in electronic circuits	ID1A_W03 ID1A_W04 ID1A_W05
W05	explains the construction, operation and application of basic electronic circuits	ID1A_W03 ID1A_W04 ID1A_W05
within the scope of ABILITIES:		
U01	can recognize and analyse simple electrical circuits	ID1A_U03 ID1A_U04
U02	can design and build simple electrical and electronic circuits	ID1A_U03 ID1A_U04
U03	can build a measuring system based on the presented diagram and make measurements	ID1A_U03 ID1A_U04
within the scope of SOCIAL COMPETENCE:		
K01	is aware of the need to cooperate in order to effectively carry out the task entrusted	ID1A_K01

4.4. Methods of assessment of the intended teaching outcomes

Teaching outcomes (code)	Method of assessment (+/-)																				
	Exam oral/written*			Test*			Laboratory report			Effort in class*			Self-study*			Group work*			Others*		
	Form of classes			Form of classes			Form of classes			Form of classes			Form of classes			Form of classes			Form of classes		
	W	C	L.	W	C	L.	W	C	L.	W	C	L.	W	C	L.	W	C	L.	W	C	L.
W01-W05	+																				
U01-U03						+			+			+			+						
K01												+			+			+			

*delete as appropriate

4.5. Criteria of assessment of the intended teaching outcomes

Form of classes	Grade	Criterion of assessment
	3	Achievement of <50–60)% of the requirements used in assessment methods

lecture (W)	3,5	Achievement of <60-70)% of the requirements used in assessment methods
	4	Achievement of <70-80)% of the requirements used in assessment methods
	4,5	Achievement of <80-90)% of the requirements used in assessment methods
	5	Achievement of <90-100)% of the requirements used in assessment methods
Laboratory (L)	3	Achievement of <50-60)% of the requirements used in assessment methods
	3,5	Achievement of <60-70)% of the requirements used in assessment methods
	4	Achievement of <70-80)% of the requirements used in assessment methods
	4,5	Achievement of <80-90)% of the requirements used in assessment methods
	5	Achievement of <90-100)% of the requirements used in assessment methods

5. BALANCE OF ECTS CREDITS - STUDENT'S WORK INPUT

Category	Student's workload	
	Full-time studies	Extramural studies
NUMBER OF HOURS WITH THE DIRECT PARTICIPATION OF THE TEACHER /CONTACT HOURS/	90	
Participation in lectures*	30	
Participation in classes, seminars, laboratories*	60	
INDEPENDENT WORK OF THE STUDENT/NON-CONTACT HOURS/	60	
Preparation for the classes, seminars, laboratories*	15	
Preparation for the exam/test*	15	
Others* Preparation of the laboratory reports	30	
TOTAL NUMBER OF HOURS	150	
ECTS credits for the course of study	6	

Accepted for execution (date and signatures of the teachers running the course in the given academic year)

.....