



Subject card

Subject name and code	Introduction to electronics and electrotechnics, PG_00052079						
Field of study	Nanotechnology						
Date of commencement of studies	October 2020	Academic year of realisation of subject			2021/2022		
Education level	first-cycle studies	Subject group			Obligatory subject group in the field of study Subject group related to scientific research in the field of study		
Mode of study	Full-time studies	Mode of delivery			at the university		
Year of study	2	Language of instruction			Polish		
Semester of study	4	ECTS credits			5.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Zakład właściwości magnetycznych i elektrycznych materiałów -> Instytut Nanotechnologii i Inżynierii Materiałowej -> Faculty of Applied Physics and Mathematics						
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Zbigniew Usarek					
	Teachers	dr inż. Bartosz Trawiński dr inż. Zbigniew Usarek					
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	15.0	15.0	0.0	60
	E-learning hours included: 0.0						
	Address on the e-learning platform: https://enauczanie.pg.edu.pl/moodle/course/view.php?id=17758 Adresy na platformie eNauczanie:						
Learning activity and number of study hours	Learning activity	Participation in didactic classes included in study plan	Participation in consultation hours		Self-study		SUM
	Number of study hours	60	5.0		60.0		125
Subject objectives	The aim of the course is to teach students the basics of electronics and electrical engineering, as well as basic skills in the design and testing of simple electronic circuits.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	K6_W08	He or she knows the basic governing laws of electronics. He or she distinguishes between the main types of electronic components.			[SW1] Assessment of factual knowledge		
	K6_U04	He or she independently plans and performs laboratory measurements of electrical quantities in accordance with received guidelines. He or she performs a critical analysis of the obtained measurement results and draws conclusions from them.			[SU1] Assessment of task fulfilment		
	K6_U05	He or she can design and build a simple electronic circuit fulfilling a specific task.			[SU1] Assessment of task fulfilment		
	K6_W09	He or she knows the structure and principle of operation of basic instruments for testing electrical circuits.			[SW1] Assessment of factual knowledge		
	K6_U07	He or she can estimate the cost of purchasing the components needed to build the designed electronic circuit.			[SU2] Assessment of ability to analyse information		

Subject contents	<ol style="list-style-type: none"> 1. Basic definitions and laws of electricity 2. Classification of electronic components 3. Resistors 4. Coils and capacitors 5. Calculation of electronic circuits 6. Passive filters 7. Semiconductors 8. Diodes 9. Bipolar transistors 10. Field effect transistors 11. Other semiconductor elements 12. Manufacturing of semiconductor devices 13. Amplifiers and feedback 14. Integrated circuits 		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Assessment of the work performed during the laboratory classes documented with a report	51.0%	20.0%
	Assessment of the degree of implementation of the electronic circuit project	51.0%	20.0%
	Final exam (90 min.)	51.0%	50.0%
	Cost estimate for the purchase of elements for the construction of the designed electronic circuit	51.0%	5.0%
	Test of knowledge about measuring instruments	51.0%	5.0%
Recommended reading	Basic literature	<ol style="list-style-type: none"> 1. A. Chwaleba, B. Moeschke, G. Ploszajski, Elektronika, WSiP, Warszawa, 1999. 2. S. Bolkowski, Elektrotechnika, WSiP, Warszawa, 2006. 3. A. Kloskowski, J. Wawer, Ł. Marcinkowski, Podstawy elektrotechniki i elektroniki, Wyd. Politechniki Gdańskiej, Gdańsk, 2015. 4. W. Opydo, Elektrotechnika i elektronika dla studentów wydziałów nieelektrycznych, Wyd. Politechniki Poznańskiej, Poznań, 2005. 5. Materials published on enauczanie: https://enauczanie.pg.edu.pl/moodle/course/view.php?id=17758 	
	Supplementary literature	<ol style="list-style-type: none"> 1. P. Hempowicz et al., Elektrotechnika i elektronika dla nieelektryków, WN-T, Warszawa, 1999. 2. P. Horowitz, W. Hill, Sztuka elektroniki 1, WKŁ, Warszawa, 2018. 3. M. Polowczyk, A. Jurewicz, Elektronika dla mechaników, Wyd. Politechniki Gdańskiej, Gdańsk 2002. 4. R. Śledziewski, Elektronika dla fizyków, PWN, Warszawa, 1982. 	
	eResources addresses		
Example issues/example questions/tasks being completed	<ol style="list-style-type: none"> 1. Describe and illustrate Kirchhoff's first law. 2. Build an RC low-pass filter and specify its cutoff frequency. 		
Work placement	Not applicable		