



## 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: <a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=17758">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=17758</a> 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	<div>1. Basic definitions and laws of electricity</div> <div>2. Classification of electronic components</div> <div>3. Resistors</div> <div>4. Coils and capacitors</div> <div>5. Calculation of electronic circuits</div> <div>6. Passive filters</div> <div>7. Semiconductors</div> <div>8. Diodes</div> <div>9. Bipolar transistors</div> <div>10. Field effect transistors</div> <div>11. Other semiconductor elements</div> <div>12. Manufacturing of semiconductor devices</div> <div>13. Amplifiers and feedback</div> <div>14. Integrated circuits</div>		
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	<div>1. A. Chwaleba, B. Moeschke, G. Płoszajski, Elektronika, WSiP, Warszawa, 1999.</div> <div>2. S. Bolkowski, Elektrotechnika, WSiP, Warszawa, 2006.</div> <div>3. A. Kloskowski, J. Wawer, Ł. Marcinkowski, Podstawy elektrotechniki i elektroniki, Wyd. Politechniki Gdańskiej, Gdańsk, 2015.</div> <div>4. W. Opydo, Elektrotechnika i elektronika dla studentów wydziałów nieelektrycznych, Wyd. Politechniki Poznańskiej, Poznań, 2005.</div> <div>5. Materials published on enauczanie: <a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=17758">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=17758</a></div>	
	Supplementary literature	<div>1. P. Hempowicz et al., Elektrotechnika i elektronika dla nieelektryków, WN-T, Warszawa, 1999.</div> <div>2. P. Horowitz, W. Hill, Sztuka elektroniki 1, WKŁ, Warszawa, 2018.</div> <div>3. M. Polowczyk, A. Jurewicz, Elektronika dla mechaników, Wyd. Politechniki Gdańskiej, Gdańsk 2002.</div> <div>4. R. Śledziwski, Elektronika dla fizyków, PWN, Warszawa, 1982.</div>	
	eResources addresses		
Example issues/ example questions/ tasks being completed	<div>1. Describe and illustrate Kirchhoff's first law.</div> <div>2. Build an RC low-pass filter and specify its cutoff frequency.</div>		
Work placement	Not applicable		