



## Subject card

Subject name and code	Introduction to electronics and electrotechnics, PG_00052079						
Field of study	Nanotechnology						
Date of commencement of studies	October 2022	Academic year of realisation of subject			2023/2024		
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	Instytut Nanotechnologii i Inżynierii Materiałowej -> Faculty of Applied Physics and Mathematics						
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Ryszard Barczyński					
	Teachers	dr hab. inż. Ryszard Barczyński dr inż. Marek Chmielewski					
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							
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_W09	The student performs measurements and analyzes their results.			[SW3] Assessment of knowledge contained in written work and projects [SW2] Assessment of knowledge contained in presentation [SW1] Assessment of factual knowledge		
	K6_U04	The student examines the properties of simple electronic circuits.			[SU1] Assessment of task fulfilment [SU4] Assessment of ability to use methods and tools		
	K6_U07	The student analyzes the cost of implementing the project.			[SU5] Assessment of ability to present the results of task [SU2] Assessment of ability to analyse information		
	K6_W08	The student designs and analyzes simple electronic circuits.			[SW2] Assessment of knowledge contained in presentation [SW3] Assessment of knowledge contained in written work and projects [SW1] Assessment of factual knowledge		
	K6_U05	The student designs and builds simple electronic circuits.			[SU4] Assessment of ability to use methods and tools [SU3] Assessment of ability to use knowledge gained from the subject [SU1] Assessment of task fulfilment		

Subject contents	<ol style="list-style-type: none"> <li>1. Basics laws of electricity and electronic components</li> <li>2. Classification of electronic components</li> <li>3. Schemes of electronic circuits</li> <li>4. DC electronic circuits</li> <li>5. AC electronic circuits</li> <li>6. Basic passive components (RLC)</li> <li>7. Active components</li> <li>8. Semiconductors</li> <li>9. Diodes</li> <li>10. Transistors</li> <li>11. Special semiconductor devices</li> <li>12. Manufacturing of semiconductor devices</li> <li>13. Integrated circuits</li> <li>14. Safe exploitation of electrical devices</li> </ol>																							
Prerequisites and co-requisites	No prerequisites																							
Assessment methods and criteria	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 45%;">Subject passing criteria</th> <th style="width: 25%;">Passing threshold</th> <th style="width: 30%;">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td>Report presenting the results of the project</td> <td>51.0%</td> <td>15.0%</td> </tr> <tr> <td>Test of knowledge about instruments used in testing electrical circuits placed on the e-course (15 min.)</td> <td>51.0%</td> <td>5.0%</td> </tr> <tr> <td>Report on the simulation of an electrical circuit</td> <td>51.0%</td> <td>5.0%</td> </tr> <tr> <td>Final exam (90 min.)</td> <td>51.0%</td> <td>50.0%</td> </tr> <tr> <td>Cost estimate for the purchase of elements for the construction of the designed electronic circuit</td> <td>51.0%</td> <td>5.0%</td> </tr> <tr> <td>Assessment of the implementation of laboratory exercises</td> <td>51.0%</td> <td>20.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	Report presenting the results of the project	51.0%	15.0%	Test of knowledge about instruments used in testing electrical circuits placed on the e-course (15 min.)	51.0%	5.0%	Report on the simulation of an electrical circuit	51.0%	5.0%	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%	Assessment of the implementation of laboratory exercises	51.0%	20.0%
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Example issues/ example questions/ tasks being completed	<ol style="list-style-type: none"> <li>1. Describe and illustrate Kirchhoff's first law.</li> <li>2. Build an RC low pass filter and determine its cut-off frequency.</li> <li>3. Design an inverting amplifier based on an operational amplifier.</li> </ol>																							
Work placement	Not applicable																							