



## Subject card

Subject name and code	Materials Science and Equipment Design - project, PG_00048806						
Field of study	Electronics and Telecommunications						
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	
Mode of study	Full-time studies	Mode of delivery				at the university	
Year of study	2	Language of instruction				Polish	
Semester of study	3	ECTS credits				1.0	
Learning profile	general academic profile	Assessment form				assessment	
Conducting unit	Department of Metrology and Optoelectronics -> Faculty of Electronics, Telecommunications and Informatics						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Barbara Stawarz-Graczyk				
	Teachers		dr inż. Barbara Stawarz-Graczyk				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	0.0	0.0	15.0	0.0	15
	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	15		1.0		9.0	25
Subject objectives	Acquaint students with software for computer-aided design of Printed Circuit Boards (PCB) and with compiling of schematic drawing. Preparation by students (individually) a technical documentation of a selected, simple electronic instrument (schematic drawing, netlist, bill of materials, user library, PCB design with through hole or SMD mounting, design of a panel for selected electronic instrument).						
Learning outcomes	Course outcome		Subject outcome			Method of verification	
	[K6_W03] Knows and understands, to an advanced extent, the construction and operating principles of components and systems related to the field of study, including theories, methods and complex relationships between them and selected specific issues - appropriate for the curriculum		knows macroscopic properties of electronic and optoelectronic materials, their parameters, selection criteria for a given application, electronic and optoelectronic elements, their characteristics and basic phenomena related to them			[SW2] Assessment of knowledge contained in presentation	
	[K6_U05] can plan and conduct experiments related to the field of study, including computer simulations and measurements; interpret obtained results and draw conclusions		measures the parameters of electronic components with the use of measuring equipment, develops technical documentation of the electronic system			[SU5] Assessment of ability to present the results of task [SU4] Assessment of ability to use methods and tools [SU1] Assessment of task fulfilment	
	[K6_W02] Knows and understands, to an advanced extent, selected laws of physics and physical phenomena as well as methods and theories explaining the complex relationships between them, constituting the basic general knowledge in the field of technical sciences related to the field of study		knows the properties of electronic and optoelectronic components, their characteristics and basic phenomena associated with them; measures the parameters of electronic components using measuring equipment, develops technical documentation of the electronic system			[SW2] Assessment of knowledge contained in presentation	

Subject contents	<p>Elements of the process of constructing devices. Basic assembly technologies (through-hole assembly, surface assembly). Getting to know computer programs supporting PCB design. Individual preparation by the student of the project of electrical connections and the design of the printed circuit of a simple electronic circuit, e.g. generator, amplifier, filter, comparator, power supply, etc. The student performs:</p> <ol style="list-style-type: none"> <li>1. introductory exercise,</li> <li>2. record of the assumptions of the assumptions for the project,</li> <li>3. schematic diagram, network of connections (netlist), list of elements (bill of materials), user's library</li> <li>4. PCB design in the through-hole version (assembly diagram).</li> </ol>								
Prerequisites and co-requisites									
Assessment methods and criteria	<table border="1" style="width: 100%;"> <thead> <tr> <th style="width: 50%;">Subject passing criteria</th> <th style="width: 25%;">Passing threshold</th> <th style="width: 25%;">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td>evaluation of design's components</td> <td>50.0%</td> <td>100.0%</td> </tr> </tbody> </table>	Subject passing criteria	Passing threshold	Percentage of the final grade	evaluation of design's components	50.0%	100.0%		
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evaluation of design's components	50.0%	100.0%							
Recommended reading	Basic literature	<ol style="list-style-type: none"> <li>1. Burcan J.: <i>Bases of technical drawings</i>. WN-T, Warszawa 2006. (in Polish).</li> <li>2. Oleksiuk W., Paprocki K.: <i>Construction of mechanical subassemblies of electronic equioment</i>. WKiŁ, Warszawa 1997. (in Polish).</li> <li>3. Laboratory documentation of the software, complementary *.pdf files -<i>User Manuals, Tutorials, data sheets</i>.</li> <li>4. <i>Catalogues of ELFA, TME, FARNELL</i></li> </ol>							
	Supplementary literature	<ol style="list-style-type: none"> <li>1. Michel K., Sapiński T.: <i>Technical drawings for electrical engineers. WN-T, Warszawa 1987. (In Polish)</i>.</li> <li>2. <i>Spiralski L., Konczakowska A.: Technological and construction bases for electronic instrumentation and systems</i>. WSM students book, Gdynia 1997. (in Polish).</li> </ol>							
	eResources addresses								
Example issues/ example questions/ tasks being completed	<pre>preliminary project  documentation sheet  PCB design</pre>								
Work placement	Not applicable								