GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Design Methodology and Manufacturing - laboratory, PG_00048090		
Field of study	Electronics and Telecommunications		
Date of commencement of studies	October 2025	Academic year of realisation of subject	2027/2028
Education level	first-cycle studies	Subject group	Optional subject group 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	3	Language of instruction	Polish
Semester of study	6	ECTS credits	2.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Department Of Metrology And Optoelectronics -> Faculty Of Electronics Telecommunications And Informatics -> Wydziały Politechniki Gdańskiej		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Arkadiusz Szewczyk	
	Teachers	dr inż. Arkadiusz Szewczyk	

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	0.0	0.0	30.0	0.0	0.0	30

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	30	2.0	18.0	50

Subject objectives

Practical learning of technology of design and manufacturing of electronic equipment.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_U07] can apply methods of process and function support, specific to the field of study	can use the methods of computer aided design and analysis of electronic devices	[SU4] Assessment of ability to use methods and tools
[K6_U03] can design, according to required specifications, and make a simple device, facility, system or carry out a process, specific to the field of study, using suitable methods, techniques, tools and materials, following engineering standards and norms, applying technologies specific to the field of study and experience gained in the professional engineering environment	is able to design, in accordance with the given specification, and build a simple electronic device	[SU1] Assessment of task fulfilment

<table>
<tr><td>Subject contents</td><td>Students in 2-3-person laboratory groups choose an electronic circuit for realisation (common for a laboratory group) with its electrical schematic and requirements, functional description and basic electricak parameters.The introductory exercise is realised by all the students and gives a possibility of learning of current version of software used and is performed strictly according to the description in the laboratory instruction. The results of this exercise are acquired to the laboratory data base.

Then students collect components necessary for the realisation of a chosen circuit, define its basic electrical and technological parameters necessary in the designing.

The scope of the laboratory program contains accomplishment using software PADS v. 9.5 of Mentor Graphics a schematic, netlist, bill of materials and PCB design together with appropriate reports. After the PCB realisation students make mounting of a chosen circuit (in the SMD or through-holes technology), prepare a program of measurements. The following circuits are available for selection::

1. Low-noise transistor amplifier
2. Generator of rectangular and triangular waveforms
3. Voltage-frequency converter
4. Power supply with feedback for +15 V
5. Acoustic amplifier 2 x 10 W
6. Circuit with AT89C2051 microcontroller for LED diodes
7. Circuit with AT89C2051 microcontroller for 7-segment display
8. Tone generator
9. Universal power module
10. Bandpass filter with multi-feedback</td></tr>
<tr><td>Prerequisites and co-requisites</td><td>For a proper realisation of tasks in the laboratory program, students should use a knowledge acquired from the following subjects: Methods and techniques of designing and realisation (lecture), Material engineering, Metrology and technique of an experiment, Analog and digital techniques.</td></tr>
<tr><td>Assessment methods and criteria</td><td><table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>Individual and group reports, realised subassembly</td><td>50.0%</td><td>100.0%</td></tr>
</table></td></tr>
<tr><td>Recommended reading</td><td><table>
<tr><td>Basic literature</td><td>1. Laboratory instruction for PADS software.
2. Laboratory documentation of software and auxiliary files from producers – User Manuals, Tutorials, data sheets.
3. Spiralski L., Konczakowska A.: Basics of technology and construction of electronic equipment and systems. WSM, Gdynia 1997. In Polish.
4. 4. Stępień St. and all: Guide for a constructor of electronic equipment. WKiŁ, Warszawa 1981. In Polish.</td></tr>
<tr><td>Supplementary literature</td><td>Brak</td></tr>
<tr><td>eResources addresses</td><td>Adresy na platformie eNauczanie:</td></tr>
</table></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td>Initial determination of basic electrical parameters and design and technology elements which knowledge is required in the design phase.</td></tr>
<tr><td>Work placement</td><td>Not applicable</td></tr>
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