GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Design Methodology and Manufacturing, PG_00048073		
Field of study	Electronics and Telecommunications		
Date of commencement of studies	October 2020	Academic year of realisation of subject	2022/2023
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	5	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. Arkadiusz Szewczyk
	Teachers	dr inż. Arkadiusz Szewczyk dr inż. Jacek Cichosz

Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	0.0	0.0	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

Give the knowledge of technology of design and manufacturing of electronic equipment.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_W32] Knows the parameters, functions and methods of analysis, design and optimization of analogue and digital circuits and electronic systems	knows how to choose and apply tools and techniques for designing electronic devices.	[SW1] Assessment of factual knowledge
[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

Subject contents

1. Basic problems of designing and engineering of electronic devices and systems.2. Designing of electronic devices allowing requirements of manufacturing..3. Factors determining designing and construction processes. Optimal solutions. 4. Enclosure and module systems. 5. Internal connections between modules: fixed and separable. 6. Elements with contacts; matching of modules. 7. Cabling. Parameters of cables, materials for conducting wires, isolators and shields. 8. Connection techniques: soldering, wire-wrapping, crimping. 9. Manual and automatic soldering. 10. Influence of the electronic devices mounting technology on environment; lead-free soldering, flux materials. 11. Electronic components for through-hole and surface mounting technology. 12. Surface mounting technology. Wave soldering, reflow soldering. 13. Production units for automatic mounting of electronic components. Automatic units for components positioning, for depositing of glue and solder. 14. Designing of pads. Influence of the mounting technology on printed board design. 15. Construction and techniques of printed circuit boards manufacturing. 16. Electronic Design Automation (EDA) software. 17. Preparation of fabrication documentation. 18. Grounding and shielding techniques. Designing of shields. 19. Cooling systems in electronic devices. Designing of the cooling systems and radiators for the typical power components.

Prerequisites and co-requisites

No requirements

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Writting exam	50.0%	100.0%
Recommended reading	Basic literature	Ryszard Kisiel:"Podstawy technologii montażu dla elektroników", BTC 2012	
	Supplementary literature	Krystyna Bukart, Halina Hackiewicz: "Lutowanie bezołowiowe", BTC 2007	
	eResources addresses	Adresy na platformie eNauczanie:	
Example issues/ example questions/ tasks being completed	CAD software, soldering, PCB assembly, devices outlines, connections, grounding, shielding.		
Work placement	Not applicable		