GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	CAD / CAM solutions in medical electronics, PG_00068260		
Field of study	Biomedical Engineering, Biomedical Engineering, Biomedical Engineering		
Date of commencement of studies	February 2027	Academic year of realisation of subject	2026/2027
Education level	second-cycle studies	Subject group	Optional subject group Specialty 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	1	Language of instruction	Polish
Semester of study	1	ECTS credits	4.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Department of Biomedical Engineering -> Faculty of Electronics Telecommunications and Informatics -> Faculties of Gdańsk University of Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Adam Bujnowski	
	Teachers	dr inż. Adam Bujnowski Jacek Ryń Hubert Toczko	

Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	15.0	15.0	0.0	45
	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	45	4.0	51.0	100

Subject objectives	The aim of the course is to acquire knowledge, both theoretical and practical, in the field of CAD / CAM solutions used in medical electronics

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K7_W10] knows and understands, to an increased extent, the basic processes occurring in the life cycle of equipment, objects and technical systems, as well as methods of supporting processes and functions, specific to the field of study	Student knows and can select appropriate design tools for individual project	[SW1] Assessment of factual knowledge
[K7_W03] knows and understands, to an increased 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	Student - is able to prepare technical documentation of the project for the manufacturer	[SW1] Assessment of factual knowledge
[K7_U08] while identifying and formulating engineering tasks specifications and solving these tasks, can: - apply analytical, simulation and experimental methods, - notice their systemic and non-technical aspects, - make a preliminary economic assessment of suggested solutions and engineering work	Student - knows and uses the tools for designing electronic circuits in medical applications	[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

Course content – lecture
1. Introduction to the topic2. CAD / CAM programs - development trends of modern applications3. The process of designing electronic devices, taking into account the requirements for medical equipment4. IPC classes in the field of electronic devices5. Working with technical documentation6. Requirements for the preparation of electrical diagrams7. The process of designing printed circuit boards8. 3D modeling for printing on 3D printers9. Preparation of product documentation10. The specificity of designing flexible circuits, CAD/CAM in themedical - implants, therapy and planning, mechanical supporting systems

Prerequisites and co-requisites

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Laboratory	50.0%	40.0%
Project	50.0%	40.0%
Lecture	50.0%	20.0%

Recommended reading

Basic literature	• **EMC and the Printed Circuit Board: Design, Theory, and Layout Made Simple.** Mark I. Montrose Copyright 1999 Institute of Electrical and Electronics Engineers, Inc. ISBN: 0-780-34703-X • **Printed Circuit Board Design Techniques for EMC Compliance: A Handbook for Designers 2nd Edition.** Mark I. Montrose, Wiley-IEEE Press; 2nd edition (July 4, 2000) • **Wprowadzenie do CAD Podstawy komputerowo wspomaganego projektowania** Maciej Sydor, Wydawnictwo Naukowe PWN, Warszawa 2012 • **Complete PCB Design Using OrCad Capture and Layout 1st Edition** Kraig Mitzner, Newnes 2007, ISBN: 9780750682145 • **Medical Device Design - Innovation from Concept to Market,** Peter J. Ogrodnik**,** Academic Press; 2nd edition
Supplementary literature	available from the teacher
eResources addresses	

Example issues/ example questions/ tasks being completed

Practical activites within the subject

Not applicable

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