GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Specialist lecture, PG_00053324		
Field of study	Biomedical Engineering, Biomedical Engineering, Biomedical Engineering		
Date of commencement of studies	February 2022	Academic year of realisation of subject	2021/2022
Education level	second-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	1	Language of instruction	Polish
Semester of study	1	ECTS credits	3.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Faculty of Applied Physics and Mathematics		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Marek Augustyniak	
	Teachers	dr inż. Marek Augustyniak	

Lesson type and method of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	15.0	0.0	0.0	0.0	15.0	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	3.0	42.0	75

Subject objectives

The classes are designed to strengthen the professional competences of future graduates of Medical Physics. They are not supposed to constitute a monothematic cycle, but relate to several areas and skills for which there is a particular market demand. The acquired experience can be used primarily in the work of a biomedical engineer in private companies, but will also be useful on the path of a scientific career. Particular emphasis is placed on computer aided design techniques and data analysis (microbiological and more).

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K7_U09] can carry out a critical analysis of the functioning of existing technical solutions and assess these solutions, as well as apply experience related to the maintenance of advanced technical systems, devices and facilities typical for the field of studies, gained in the professional engineering environment	The student knows the techniques of computer-assisted medical services. He/she can largely independently develop further skills in this direction.	[SU3] Assessment of ability to use knowledge gained from the subject [SU2] Assessment of ability to analyse information
[K7_W08] Knows and understands, to an increased extent, the fundamental dilemmas of modern civilisation, the main development trends of scientific disciplines relevant to the field of education.	During these classes, the student is to make a mature and realistic decision regarding his/her professional career, understanding the differences between the work of an engineer and the work of a scientist, and knowing the specificity of the medical services market.	[SW3] Assessment of knowledge contained in written work and projects

<table>
<tr><td>Subject contents</td><td>1. From imaging to 3D printing - rules for converting medical data to printable models (DICOM -> STL); sample programs: ITK / Snap, Mimics Innovation Suite

2. FEM models and Virtual Laboratory - practical rules of predicting mechanical, thermal and electromagnetic properties of tissues, prostheses and other objects; CAD elements

3. TechInfoMaster: methods of analyzing numerical and text data, especially with the use of scripts and Python libraries; obtaining reliable technical information from the network; microbiological / genetic examples and others

The above list is not exhaustive, and is supposed to depend on preferences reported by students at the beginning of the semester.</td></tr>
<tr><td>Prerequisites and co-requisites</td><td></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>prace projektowe</td><td>50.0%</td><td>50.0%</td></tr>
<tr><td>attendance</td><td>50.0%</td><td>50.0%</td></tr>
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<tr><td>Recommended reading</td><td><table>
<tr><td>Basic literature</td><td>Selected scientific/technical articles published by Elsevier, Springer, PZWL, e.g. included in the journals "Biomedical Engineering Advances", "Annals of Biomedical Engineering".

Web portals and user manuals of computer-assisted design/ engineering software.</td></tr>
<tr><td>Supplementary literature</td><td>-</td></tr>
<tr><td>eResources addresses</td><td></td></tr>
</table></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td>1. From imaging to 3D printing - rules for converting medical data to printable models (DICOM -> STL); sample programs: ITK / Snap, Mimics Innovation Suite

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<tr><td>Work placement</td><td>It is highly recommended that students establish relationships with companies/institutions where they might make use of the acuired skills.</td></tr>
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