GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Medical Imaging, PG_00050111		
Field of study	Biomedical Engineering		
Date of commencement of studies	October 2025	Academic year of realisation of subject	2028/2029
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	4	Language of instruction	Polish
Semester of study	7	ECTS credits	3.0
Learning profile	general academic profile	Assessment form	exam
Conducting unit	Department Of Biomedical Engineering -> Faculty Of Electronics Telecommunications And Informatics -> Wydziały Politechniki Gdańskiej		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Artur Poliński	
	Teachers	dr inż. Artur Poliński	

Lesson types and methods of instruction

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

Subject objectives

Information about selected issues of medical imaging

Learning outcomes

Course outcome	Subject outcome	Method of verification
[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	has basic knowledge of various tomographies	[SW1] Assessment of factual knowledge

Subject contents

1. Introduction to CT imaging 2. Algebraic reconstruction 3. Iterative reconstruction 4. Radon transform 5. Sinogram 6. Inverse Radon transform 7. Filtering and reconstruction by filtered backprojection 8. Introduction to MRI imaging 9. 2D and 3D Fourier imaging in MRI 10. Projection reconstruction in MRI 11. Multislice MRI imaging 12. T1 and T2 weighted images 13. Fast MRI imaging 14. High resolution and microscope MRI imaging 15. MRI flow imaging 16. Intorduction to SPECT and PET tomography 17. Maximum likelihood algorithm 18. Attenuation and scattring correction methods

Prerequisites and co-requisites

No requirements

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
exam	51.0%	50.0%
project	51.0%	50.0%

Recommended reading	Basic literature	Björck ., Dahlquist G., Metody numeryczne, PWN 1983 Chmielewski L., Kulikowski J.L., Nowakowski A. (red.) Obrazowanie biomedyczne. Biocybernetyka i Inżynieria Biomedyczna 2000, Tom 8, Akademicka Oficyna Wydawnicza Exit 2003 Cho Z.-H., Jones J. P., Singh M., Foundations of Medical Imaging, John Wiley & Sons 1993 Cierniak R., Tomografia komputerowa. Budowa urządzeń CT. Algorytmy rekonstrukcyjne, Akademicka Oficyna Wydawnicza Exit 2005 Cornelis J., An introduction to medical magnetic resonance imaging, VUB, Brussel 1998 Fortuna Z., Macukow B., Wąsowski J., Metody numeryczne, WNT 2006 Lippman S. B., Lajoie, Podstawy języka C++, WNT, 2001 Ralston A., Wstęp do analizy numerycznej, PWN 1983 Stoer J.,Bulirsch R., Wstęp do analizy numerycznej, PWN 1987 Tondo C. L., Leung B.P., Podstawy języka C++. Ćwiczenia i rozwiązania, WNT, 2001 Vievergever M. A., Todd-Pokropek A., Mathematics and computer science in medical imaging, Springer-Verlag 1988
	Supplementary literature	No requirements
	eResources addresses	Adresy na platformie eNauczanie:
Example issues/ example questions/ tasks being completed		
Work placement	Not applicable	

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