

## GDAŃSK UNIVERSITY

## Subject card

Subject name and code	Advanced Processing of Telecommunications Signals - Laboratory, PG_00048360							
Field of study	Electronics and Telecommunications							
Date of commencement of studies	February 2026		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	2		Language of instruction			Polish		
Semester of study	3		ECTS credits			1.0		
Learning profile	general academic profile		Assessment form			assessment		
Conducting unit	Department Of Teleinformation Networks -> Faculty Of Electronics Telecommunications And Informatics -> Wydziały Politechniki Gdańskiej							
Name and surname of lecturer (lecturers)	Subject supervisor		mgr inż. Jacek Litka					
	Teachers		mgr inż. Jacek Litka					
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Projec	t	Seminar	SUM
	Number of study hours	0.0	0.0	15.0	0.0		0.0	15
	E-learning hours included: 0.0							
Learning activity and number of study hours	Learning activity Participation ir classes includ plan		I didactic         Participation in           ed in study         consultation hours		Self-study SUM			
	Number of study hours	15		1.0		9.0		25
Subject objectives	Practical familiarization with selected advanced digital signal processing techniques encountered in digital telecommunications.							
Learning outcomes	Course outcome		Subject outcome			Method of verification		
	[K7_K02] is ready to provide critical evaluation of received content and to acknowledge the importance of knowledge in solving cognitive and practical problems		In the scope of the subject of laboratory exercises, student analyzes advanced signal processing algorithms and examines the obtained signals, interprets them and based on them draws conclusions about algorithm's correctness, its properties and accuracy.			[SK4] Assessment of communication skills, including language correctness [SK2] Assessment of progress of work [SK1] Assessment of group work skills		
	[K7_U12] is able, to an increased extent, to analyze the operation of components and systems related to the field of study, as well as to measure their parameters and study their technical characteristics, and to plan and carry out experiments related to the field of study, including computer simulations, interpret the obtained results and draw conclusions		In the scope of laboratory tasks, the student plans and carries out measurements and on the basis of obtained results modifies computer implementations of digital signal processing algorithms.			[SU4] Assessment of ability to use methods and tools [SU2] Assessment of ability to analyse information [SU1] Assessment of task fulfilment		

Subject contents	<ol> <li>Classic sample rate conversion - interpolation and decimation filters design.</li> <li>Interpolation and decimation filters - poliphase decomposition.</li> <li>Multistage sample rate conversion.</li> <li>Incommensurate sample rate conversion.</li> <li>I-FIR filters and their applications.</li> <li>Multichannel modulator and demodulator.</li> <li>Spectrum spreading techniques – FHSS and DSSS.</li> </ol>						
Prerequisites and co-requisites	Advanced processing of telecommunication signals (E:37037W0)						
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade				
	Presentation of results of completed laboratory tasks	50.0%	20.0%				
	Written peports from laboratory tasks	50.0%	70.0%				
	Activity	0.0%	10.0%				
Recommended reading	Basic literature	<ol> <li>Fredric J. Harris: Multirate Signal Processing for Communication Systems, Prentice Hall, 2004</li> <li>John G. Proakis, Dimitris K. Manolakis: Digital Signal Processing, Prentice Hall, 2006</li> <li>Andrea Goldsmith: Wireless Communications, Stanford University, California, 2005</li> </ol>					
	Supplementary literature	<ol> <li>P. P. Vaidyanathan: Multirate Systems And Filter Banks, Prentice Hall, 1992</li> <li>Ronald E. Crochiere, Lawrence R. Rabiner: Multirate Digital Signal Processing, Prentice Hall, 1983</li> <li>M. Ibnkahla Ed., Signal Processing for Mobile Communications Handbook, CRC Press, 2004</li> </ol>					
	eResources addresses	Adresy na platformie eNauczanie:					
Example issues/ example questions/ tasks being completed							
Work placement	Not applicable						

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