



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 2023		Academic year of realisation of subject		2023/2024		
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	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						
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	Project	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 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	Practical familiarization with selected advanced digital signal processing techniques encountered in digital telecommunications.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K7_U05] can plan and conduct experiments related to the field of study, including computer simulations and measurements; interpret 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.		[SU1] Assessment of task fulfilment [SU2] Assessment of ability to analyse information [SU4] Assessment of ability to use methods and tools		
	[K7_U06] can analyse the operation of components, circuits and systems related to the field of study; measure their parameters; examine technical specifications; interpret obtained results and draw conclusions		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.		[SU1] Assessment of task fulfilment [SU2] Assessment of ability to analyse information [SU4] Assessment of ability to use methods and tools		
Subject contents	<div>1. Classic sample rate conversion - interpolation and decimation filters design.</div> <div>2. Interpolation and decimation filters - polyphase decomposition.</div> <div>3. Multistage sample rate conversion.</div> <div>4. Incommensurate sample rate conversion.</div> <div>5. I-FIR filters and their applications.</div> <div>6. Multichannel modulator and demodulator.</div> <div>7. Spectrum spreading techniques – FHSS and DSSS.</div>						
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 reports from laboratory tasks	50.0%	70.0%
	Activity	0.0%	10.0%
Recommended reading	Basic literature	1. Fredric J. Harris: Multirate Signal Processing for Communication Systems, Prentice Hall, 2004 2. John G. Proakis, Dimitris K. Manolakis: Digital Signal Processing, Prentice Hall, 2006 3. Andrea Goldsmith: Wireless Communications, Stanford University, California, 2005	
	Supplementary literature	1. P. P. Vaidyanathan: Multirate Systems And Filter Banks, Prentice Hall, 1992 2. Ronald E. Crochiere, Lawrence R. Rabiner: Multirate Digital Signal Processing, Prentice Hall, 1983 3. M. Ibnkahla Ed., Signal Processing for Mobile Communications Handbook, CRC Press, 2004	
	eResources addresses	Adresy na platformie eNauczanie: Zaawansowane przetwarzanie sygnałów telekomunikacji cyfrowej - Laboratorium 2023/2024 - Moodle ID: 36827 https://enauczenie.pg.edu.pl/moodle/course/view.php?id=36827	
Example issues/ example questions/ tasks being completed			
Work placement	Not applicable		