GDAŃSK UNIVERSITY OF TECHNOLOGY

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 2027	Academic year of realisation of subject	2027/2028
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 -> Faculties of Gdańsk University of Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	prof. dr hab. inż. Adrian Bekasiewicz	
	Teachers	prof. dr hab. inż. Adrian Bekasiewicz	

Lesson types

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_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.	[SU1] Assessment of task fulfilment [SU2] Assessment of ability to analyse information [SU4] Assessment of ability to use methods and tools
[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.	[SK1] Assessment of group work skills [SK2] Assessment of progress of work [SK4] Assessment of communication skills, including language correctness

<table>
<tr><td>Subject contents</td><td>Course content – laboratory

1. Classic sample rate conversion - interpolation and decimation filters design.
2. Interpolation and decimation filters - poliphase decomposition.
3. Multistage sample rate conversion.
4. Incommensurate sample rate conversion.
5. I-FIR filters and their applications.
6. Multichannel modulator and demodulator.
7. Spectrum spreading techniques – FHSS and DSSS.</td></tr>
<tr><td>Prerequisites and co-requisites</td><td>Advanced processing of telecommunication signals (E:37037W0)</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>Activity</td><td>0.0%</td><td>10.0%</td></tr>
<tr><td>Written peports from laboratory tasks</td><td>50.0%</td><td>70.0%</td></tr>
<tr><td>Presentation of results of completed laboratory tasks</td><td>50.0%</td><td>20.0%</td></tr>
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</td></tr>
<tr><td>Recommended reading</td><td>
<table>
<tr><td>Basic literature</td><td>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</td></tr>
<tr><td>Supplementary literature</td><td>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</td></tr>
<tr><td>eResources addresses</td><td></td></tr>
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<tr><td>Example issues/ example questions/ tasks being completed</td><td></td></tr>
<tr><td>Practical activites within the subject</td><td>Not applicable</td></tr>
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