



Subject card

Subject name and code	System Identification II, PG_00047415						
Field of study	Automatic Control, Cybernetics and Robotics						
Date of commencement of studies	October 2024	Academic year of realisation of subject				2025/2026	
Education level	second-cycle studies	Subject group				Obligatory subject group in the field of study 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				English	
Semester of study	3	ECTS credits				1.0	
Learning profile	general academic profile	Assessment form				assessment	
Conducting unit	Department of Automatic Control -> Faculty of Electronics, Telecommunications and Informatics						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Piotr Kaczmarek				
	Teachers		dr inż. Piotr Kaczmarek				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	0.0	0.0	15.0	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		2.0		8.0	25
Subject objectives	Practical applications of identification methods						
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	The student can implement advanced signal processing algorithms.			[SU1] Assessment of task fulfilment		
	[K7_U03] can design, according to required specifications, and make a complex device, facility, system or carry out a process, specific to the field of study, using suitable methods, techniques, tools and materials, following engineering standards and norms, applying technologies specific to the field of study and experience gained in the professional engineering environment	The student is able to choose the appropriate tools to the task of process identification. The student is able to evaluate the computational complexity of identification algorithms.			[SU1] Assessment of task fulfilment		
	[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	Student can use identification methods for signal processing.			[SU1] Assessment of task fulfilment		

Subject contents	<p>Project 1: Comparison of parametric and nonparametric spectrum estimation methods - 7 h. 1.1. Splitting recorded word into separate characters  1.2. Implementation of a Hamming window  1.3. Design of a program for parametric spectrum estimation using the Durbin-Levinson procedure  1.4. Design of a program for nonparametric spectrum estimation using the FFT procedure  1.5. Comparison of resulting spectrums  1.6. Description of the final program</p> <p>Project 2: Application of system identification to elimination of impulsive disturbances from audio signals - 8 h.  2.1. Design of a procedure for handling WAVE audio files  2.2. Design of a procedure for AR-based prediction of audio signals  2.3. Design of a procedure for prediction-based detection of impulsive disturbances  2.4. Design of a procedure for AR-based reconstruction of a fragment of an audio signal  2.5. Design of a disturbance elimination program using the available procedure  2.6. Evaluation of restoration results (using recordings provided by the supervisor)  2.7. Description of methods and algorithms used to solve the problem – written report  2.8. Description of the final program</p>											
Prerequisites and co-requisites												
Assessment methods and criteria	<table border="1"> <thead> <tr> <th data-bbox="456 564 794 586">Subject passing criteria</th> <th data-bbox="801 564 1139 586">Passing threshold</th> <th data-bbox="1145 564 1482 586">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td data-bbox="456 595 794 640">The effect of the implemented software</td> <td data-bbox="801 595 1139 640">55.0%</td> <td data-bbox="1145 595 1482 640">80.0%</td> </tr> <tr> <td data-bbox="456 649 794 672">Documentation</td> <td data-bbox="801 649 1139 672">55.0%</td> <td data-bbox="1145 649 1482 672">20.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	The effect of the implemented software	55.0%	80.0%	Documentation	55.0%	20.0%
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Recommended reading	<table border="1"> <tbody> <tr> <td data-bbox="456 698 794 721">Basic literature</td> <td colspan="2" data-bbox="801 698 1482 721">Söderström T. Stoica P. "Identyfikacja Systemów" PWN 1997</td> </tr> <tr> <td data-bbox="456 730 794 752">Supplementary literature</td> <td colspan="2" data-bbox="801 730 1482 752">No requirements</td> </tr> <tr> <td data-bbox="456 761 794 784">eResources addresses</td> <td colspan="2" data-bbox="801 761 1482 784">Adresy na platformie eNauczenie:</td> </tr> </tbody> </table>			Basic literature	Söderström T. Stoica P. "Identyfikacja Systemów" PWN 1997		Supplementary literature	No requirements		eResources addresses	Adresy na platformie eNauczenie:	
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Supplementary literature	No requirements											
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Example issues/ example questions/ tasks being completed												
Work placement	Not applicable											

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