



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 2022	Academic year of realisation of subject			2023/2024		
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	4	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_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		
	[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_U21] can individually carry out an in-depth analysis of controlling, diagnostics and signal processing problems; and, to an advanced extent, is able to individually design, tune and operate automatic regulation, control and robotics systems; and use computers to control and monitor dynamic systems		The student is able to design and implement an algorithm for identifying parameters of non-stationary processes		[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" data-bbox="448 551 1497 680"> <thead> <tr> <th data-bbox="448 551 794 584">Subject passing criteria</th> <th data-bbox="794 551 1142 584">Passing threshold</th> <th data-bbox="1142 551 1497 584">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td data-bbox="448 584 794 618">Documentation</td> <td data-bbox="794 584 1142 618">55.0%</td> <td data-bbox="1142 584 1497 618">20.0%</td> </tr> <tr> <td data-bbox="448 618 794 680">The effect of the implemented software</td> <td data-bbox="794 618 1142 680">55.0%</td> <td data-bbox="1142 618 1497 680">80.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	Documentation	55.0%	20.0%	The effect of the implemented software	55.0%	80.0%
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Recommended reading	<table border="1" data-bbox="448 687 1497 846"> <tbody> <tr> <td data-bbox="448 687 794 721">Basic literature</td> <td colspan="2" data-bbox="794 687 1497 721">Söderström T. Stoica P. "Identyfikacja Systemów" PWN 1997</td> </tr> <tr> <td data-bbox="448 721 794 754">Supplementary literature</td> <td colspan="2" data-bbox="794 721 1497 754">No requirements</td> </tr> <tr> <td data-bbox="448 754 794 846">eResources addresses</td> <td colspan="2" data-bbox="794 754 1497 846"> Adresy na platformie eNauczenie: System identification 2023/24 - project - Moodle ID: 36765 https://enauczenie.pg.edu.pl/moodle/course/view.php?id=36765 </td> </tr> </tbody> </table>			Basic literature	Söderström T. Stoica P. "Identyfikacja Systemów" PWN 1997		Supplementary literature	No requirements		eResources addresses	Adresy na platformie eNauczenie: System identification 2023/24 - project - Moodle ID: 36765 https://enauczenie.pg.edu.pl/moodle/course/view.php?id=36765	
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Example issues/ example questions/ tasks being completed												
Work placement	Not applicable											