

。 GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Modelling of Economical Processes, PG_00047782							
Field of study	Informatics							
Date of commencement of studies	October 2023		Academic year of realisation of subject		2024/2025			
Education level	second-cycle studies		Subject group		Optional subject group Subject group related to scientific research in the field of study			
Mode of study	Part-time studies		Mode of delivery			at the university		
Year of study	2		Language of instruction		Polish			
Semester of study	4		ECTS credits		4.0			
Learning profile	general academic profile		Assessment form		exam			
Conducting unit	Department of Computer Communications -> Faculty of Electronics, Telecommunications and Informatics							
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Jerzy Konorski					
	Teachers		dr hab. inż. Jerzy Konorski					
			dr inż. Krzysztof Cisowski					
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Projec	t	Seminar	SUM
	Number of study hours	12.0	0.0	0.0	15.0		0.0	27
	E-learning hours included: 0.0							
Learning activity and number of study hours	Learning activity	Participation i classes incluc plan	n didactic led in study	Participation in consultation hours		Self-study		SUM
	Number of study hours	27		10.0		63.0		100
Subject objectives	Acquisition of simple methods of computer modelling rational agents' interactions using forecasting and game theory.							

Learning outcomes	Course outcome	Subject outcome	Method of verification			
	[K7_W05] Knows and understands, to an increased extent, methods of process and function support, specific to the field of study.	Student understands the importance of prognosing economic phenomena and of game theory for the analysis of complex computer systems.	[SW1] Assessment of factual knowledge			
	[K7_W03] knows and understands, to an increased extent, the construction and operating principles of components and systems related to the field of study, including theories, methods and complex relationships between them and selected specific issues - appropriate for the curriculum	Student knows basic methods of prognosing economic phenomena and of game theory.	[SW1] Assessment of factual knowledge			
	[K7_U42] can solve engineering and research problems including design, assessment and maintenance of information systems and applications, using experimental methods and management techniques	Student can select methods of solving problems related to econometric and trust building problems.	[SU3] Assessment of ability to use knowledge gained from the subject [SU4] Assessment of ability to use methods and tools			
	[K7_U05] can plan and conduct experiments related to the field of study, including computer simulations and measurements; interpret obtained results and draw conclusions	Student can apply basic methods of prognosing economic phenomena and of game theory to self-generated computer models.	[SU1] Assessment of task fulfilment			
	[K7_K02] is ready to provide critical evaluation of received content and to acknowledge the importance of knowledge in solving cognitive and practical problems	Student can present and use known methods to evaluate progress of work on selected problems related to economic modeling.	[SK4] Assessment of communication skills, including language correctness [SK2] Assessment of progress of work			
Subject contents	Modeling of real-world phenomena.					
	Structural (econometric) modeling - examples.					
	Selection of variables, analytical forms and parameter identification.					
	Simulation based on econometric model - an example.					
	Non-structural models: moving average, exponential weighting, progression, periodic component and autoregressive.					
	Economic modeling based on artificial neural networks.					
	Econophysics, statistical properties of price fluctuations, prediction models, model quality, random walk processes.					
	Forecasting - definitions, rules and methods.					
	Forecasting based on time series analysis.					
	Market game and auction models. Cooperative and noncooperative games in strategic form. Pure and mixed strategies, solution concepts, the notions of common knowledge and equilibrium. Problems with multiple equilibria.					
	Multistage games in extensive form, repeated games. Dynamic game scenarios, convergence to equilibria. Cournot model, fictitious play, synchronous and asynchronous learning.					
Prerequisites and co-requisites						

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade		
	Presentation of results of assigned lab exercises	50.0%	50.0%		
	test covering lecture material	50.0%	50.0%		
Recommended reading	Basic literature	lecture notes by course teacher			
	pplementary literature E. Rasmusen: Games and information, Blackwell 2001 (ch. 1 to 6)				
	eResources addresses	Adresy na platformie eNauczanie: Modelowanie Procesów Ekonomicznych 2025 - Moodle ID: 44458 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=44458			
Example issues/ example questions/ tasks being completed					
Work placement	Not applicable				

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