



Subject card

Subject name and code	Modelling of Economical Processes, PG_00047782						
Field of study	Informatics						
Date of commencement of studies	October 2022	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	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	Project	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 in didactic classes included in study plan	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_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.	[SK2] Assessment of progress of work [SK4] Assessment of communication skills, including language correctness
	[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_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.	[SU4] Assessment of ability to use methods and tools [SU3] Assessment of ability to use knowledge gained from the subject
	[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_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
Subject contents	<p>Modeling of real-world phenomena.</p> <p>Structural (econometric) modeling - examples.</p> <p>Selection of variables, analytical forms and parameter identification.</p> <p>Simulation based on econometric model - an example.</p> <p>Non-structural models: moving average, exponential weighting, progression, periodic component and autoregressive.</p> <p>Economic modeling based on artificial neural networks.</p> <p>Econophysics, statistical properties of price fluctuations, prediction models, model quality, random walk processes.</p> <p>Forecasting - definitions, rules and methods.</p> <p>Forecasting based on time series analysis.</p> <p>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.</p> <p>Multistage games in extensive form, repeated games. Dynamic game scenarios, convergence to equilibria. Cournot model, fictitious play, synchronous and asynchronous learning.</p>		
Prerequisites and co-requisites			

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	test covering lecture material	50.0%	50.0%
	Presentation of results of assigned lab exercises	50.0%	50.0%
Recommended reading	Basic literature	lecture notes by course teacher	
	Supplementary literature	E. Rasmusen: Games and information, Blackwell 2001 (ch. 1 to 6)	
	eResources addresses	Adresy na platformie eNauczenie: Modelowanie procesów ekonomicznych 2024 - Moodle ID: 38575 https://enauczenie.pg.edu.pl/moodle/course/view.php?id=38575	
Example issues/ example questions/ tasks being completed			
Work placement	Not applicable		