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 2025	Academic year of realisation of subject	2026/2027
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 -> Wydziały Politechniki Gdańskiej
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.	[SK4] Assessment of communication skills, including language correctness [SK2] Assessment of progress of work
	[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

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
	Supplementary literature	E. Rasmusen: Games and information, Blackwell 2001 (ch. 1 to 6)
	eResources addresses	

Example issues/ example questions/ tasks being completed	
Work placement	Not applicable

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