



Subject card

Subject name and code	Modelling of Economical Processes, PG_00047782						
Field of study	Informatics						
Date of commencement of studies	October 2026	Academic year of realisation of subject			2027/2028		
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 -> Faculties of Gdańsk University of Technology						
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	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_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_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		

Subject contents	<p>Course content – lecture 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	<table border="1"> <thead> <tr> <th data-bbox="459 1171 794 1205">Subject passing criteria</th> <th data-bbox="802 1171 1137 1205">Passing threshold</th> <th data-bbox="1145 1171 1481 1205">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td data-bbox="459 1205 794 1238">test covering lecture material</td> <td data-bbox="802 1205 1137 1238">50.0%</td> <td data-bbox="1145 1205 1481 1238">50.0%</td> </tr> <tr> <td data-bbox="459 1238 794 1294">Presentation of results of assigned lab exercises</td> <td data-bbox="802 1238 1137 1294">50.0%</td> <td data-bbox="1145 1238 1481 1294">50.0%</td> </tr> </tbody> </table>			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%
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Recommended reading	<p>Basic literature</p> <p>Supplementary literature</p> <p>eResources addresses</p>	<p>lecture notes by course teacher</p> <p>E. Rasmusen: Games and information, Blackwell 2001 (ch. 1 to 6)</p>										
Example issues/ example questions/ tasks being completed												
Practical activities within the subject	Not applicable											

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