GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Microeconomic Mechanisms in Computer Communications, PG_00048057						
Field of study	Informatics						
Date of commencement of studies	February 2024		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	Full-time studies		Mode of delivery		at the university		
Year of study	2		Language of instruction		Polish		
Semester of study	3		ECTS credits		3.0		
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				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	0.0	0.0	15.0	30
	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	30		6.0		39.0	75
Subject objectives	Outline of computer networks analysis in the noncooperative paradigm.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K7_W01] Knows and understands, to an increased extent, mathematics to the extent necessary to formulate and solve complex issues related to the field of study.	Student understands relevant notions and methods of noncooperative game theory that are necessary to analyze networking environments in the noncooperative paradigm	[SW1] Assessment of factual knowledge
	[K7_U41] can select methods of modelling and analysis of information systems and applications using selected elements of theoretical computer science and modern programming tools	Student can absorb, adapt and evaluate source publications on applications of game theory to computer communication systems.	[SU5] Assessment of ability to present the results of task [SU3] Assessment of ability to use knowledge gained from the subject [SU2] Assessment of ability to analyse information
	[K7_W42] Knows and understands, to an increased extent, the principles and trends in the analysis and design of local and distributed IT systems and the basics of computer modeling and computerization of complex cognitive and decision-making processes.	Student understands the evolution of computer networks towards systems of autonomous agents and the arising need to their modeling in the noncooperative paradigm.	[SW2] Assessment of knowledge contained in presentation
	[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 understands the description of noncooperative behavior of network elements and its implications for prediction of the network operating point.	[SW2] Assessment of knowledge contained in presentation [SW1] Assessment of factual knowledge
	[K7_W06] Knows and understands, to an increased extent, the basic processes taking place in the life cycle of devices, facilities and technical systems.	Student understands the description of noncooperative behavior of network elements and its implications for prediction of the network operating point.	[SW2] Assessment of knowledge contained in presentation [SW1] Assessment of factual knowledge

Subject contents	1. Introduction to the course, assessment items 2. Network technologies versus types of network services, microeconomic design paradigm 3. Principles of creation of a traffic contract 4. Overprovisioning as an alternative to congestion control 5. Design of communication mechanisms for cooperative and noncooperative environments 6. Pricing mechanisms as economic and technological tools 7. Protocols of fair information exchange at the user-to-network interface 8. Structure and parameter negotiation in traffic contracts 9. Examples of static and dynamic contracts 10. Microeconomic models of selected network mechanisms and services 11. Use of mechanism design to control network performance 12. Realization of selected incentive compatible mechanisms in computer communication networks 13. Strategic equilibrium: determination and comparison with globally optimal network operation 14. Principles of design of reputation mechanisms in wireless networks

Prerequisites and co-requisites	

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	exam	50.0%	50.0%
	presentation of selected material	50.0%	50.0%

Recommended reading	Basic literature	C. Courcoubetis, R. Weber: Pricing communication networks, J. Wiley 2003 (fragments) E. Rasmusen: Games and information, Blackwell 2001 (ch. 1-6)
	Supplementary literature	No requirements
	eResources addresses	Adresy na platformie eNauczanie:

Example issues/ example questions/ tasks being completed	

Work placement	Not applicable