



Subject card

Subject name and code	Microeconomic Mechanisms in Computer Communications, PG_00048057						
Field of study	Informatics						
Date of commencement of studies	February 2025		Academic year of realisation of subject		2024/2025		
Education level	second-cycle studies		Subject group		Optional subject group Specialty 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	1		Language of instruction		Polish		
Semester of study	1		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_U08] while identifying and formulating engineering tasks specifications and solving these tasks, can: - apply analytical, simulation and experimental methods, - notice their systemic and non-technical aspects, - make a preliminary economic assessment of suggested solutions and engineering work		Student can solve simple games modelling noncooperative behavior of network components.		[SU4] Assessment of ability to use methods and tools		
	[K7_W101] is able to make an in-depth identification of key objects and phenomena related to the field of study, as well as theories that describe them and applicable analytical and design methods		Student identifies conflicts of interests among parties of network communication processes, and associates with them suitable elements of the game theory apparatus.		[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 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_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		

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		

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