

。 GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Computer Communication Networks Analysis, PG_00048060								
Field of study	Informatics								
Date of commencement of studies	February 2026		Academic year of realisation of subject			2026/2027			
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	2		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						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Projec	ect Semin		SUM	
	Number of study hours	15.0	15.0	0.0	0.0		30.0	60	
	E-learning hours included: 0.0								
Learning activity and number of study hours	Learning activity	activity Participation ir classes includ plan		Participation consultation I	ipation in S Itation hours		udy	SUM	
	Number of study hours	60		8.0		32.0		100	
Subject objectives	Sensitizing students to the need for analytical nethods in the design and performance evaluation of computer networks.								

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 explains the principles of mathematical and simulation- based modeling of computer network functionalities, with examples of concrete network environments and protocols.	[SW1] Assessment of factual knowledge				
	[K7_U10] can individually plan and pursuit their own lifelong education and influence others in this aspect, also by means of advanced information and communication technologies (ICT), and communicate on specialist issues with diverse recipients, appropriately justify points of view, hold debates, present, assess and discuss different opinions and points of view, as well as use specialist terminology related to the field of study in communication	Student can present and discuss selected methods and results of computer network analysis.	[SU4] Assessment of ability to use methods and tools [SU2] Assessment of ability to analyse information				
	[K7_U12] is able, to an increased extent, to analyze the operation of components and systems related to the field of study, as well as to measure their parameters and study their technical characteristics, and to plan and carry out experiments related to the field of study, including computer simulations, interpret the obtained results and draw conclusions	Student can identify relevant parameters of computer network operation.	[SU2] Assessment of ability to analyse information				
Subject contents	Introduction to the course, description of assessment items. Goals of computer communication networks analysis. Selected mathematical methods of computer network analysis: flow maximization, advanced queuing systems, optimum routing and capacity assignment, nonlinear and multicriteria optimization, basics of QoS routing. Principal performance measures and characteristics of application requirements Performance analysis of selected network protocols and mechanisms. Seminar topics: Traffic analysis for selected types of network applications. Characteristics and methods of increasing network reliability. Mechanisms of self-organization in data communication networks. Methods of data transport in DTN networks. Traffic management in SDN. Analytical models of transport protocols for IP networks. Models and tools for simulation of computer networks. Measurements of selected characteristics of traffic handling in IP networks. Cognitive networks. Multi-hop wireless networks - characteristics and analysis. Selected cooperative network revironments. Selected routing mechanisms. Selected QoS and GoS issues. Dimensioning of network resources. Issues of construction of overlay networks. IoT modeling and analysis issues. Applications of AI and ML for modeling and analysis of selected network environments. Traffic management in optical networks.						
Prerequisites and co-requisites							
Assessment methods and criteria	Subject passing criteria seminar presentations of selected topics	Passing threshold 50.0%	Percentage of the final grade 60.0%				
	final test	50.0%	40.0%				
Recommended reading	Basic literature	W. Stallings, Data and Computer Communications, 9th ed. Prentice- Hall 2011					
	Supplementary literature	selected research and survey material available online					
	eResources addresses	Adresy na platformie eNauczanie:					
Example issues/ example questions/ tasks being completed							
Work placement	Not applicable						

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