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 2025	Academic year of realisation of subject	2025/2026
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

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	15.0	0.0	0.0	30.0	60
	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	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_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
	[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.	[SU2] Assessment of ability to analyse information [SU4] Assessment of ability to use methods and tools
	[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

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 environments. 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	Passing threshold	Percentage of the final grade
	final test	50.0%	40.0%
	seminar presentations of selected topics	50.0%	60.0%

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

Document generated electronically. Does not require a seal or signature.