



## Subject card

Subject name and code	Multimedia and Interfaces, PG_00058930						
Field of study	Informatics						
Date of commencement of studies	October 2026	Academic year of realisation of subject			2027/2028		
Education level	first-cycle studies	Subject group			Obligatory subject group in the field of study 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	3	ECTS credits			4.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Department of Intelligent Interactive Systems -> Faculty of Electronics Telecommunications and Informatics -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Mariusz Szwoch				
	Teachers		dr inż. Mariusz Szwoch				
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	15.0	0.0	0.0	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		4.0		66.0	100
Subject objectives	Student understands notion of telecommunication network, its architecture, principles of providing services fixed and mobile networks with circuit and packet switching. Student knows principles of circuit and packet switching nodes operation. Student understands principles of traffic engineering, operation of Intelligent Network and network management.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		

Subject contents	<p>Course content – lecture</p> <p>1. Definition of telecommunications and notions composing definition of telecommunications: information: categories and measures, categories of information transport methods, telecommunication service. 2. Outline of telecommunications history as a evolutionary process conditioned by the development of technology and services. Criteria of telecommunications division. Characteristics of information society. 3. Notion of telecommunication network. Function of network and its elements. Circuit switching, message switching and packet switching networks. Characteristics of basic network structures. Hierarchical structure of the network. 4. Principles of network addressation and numeration. Notion of routing function. 5. Characteristics of services provided by telecommunication network: notion of multimedia service, notion of bearer service, teleservice, supplementary service and additional service. Conditions of service providing. 6. Notion of telecommunication channel, basic parameters and types of channels. Characteristics of analog, digital, electrical and optical signals. Types and modes of transmission. Principles of electrical and optical signals transmission. 7. Characteristics of basic types of networks: public, wide area, local networks, narrowband and broadband networks, Internet, Intranet. 8. Characteristics of transmission media: wired, coaxial, fiber optic, wireless, satellite. 9. Principles of transmission media multiple utilization (FDM, TDM, CDM). Principle of analog to digital signal conversion. 10. Fixed and mobile radiocommunication networks. 11. Telecommunication network as a mass scale service system. Notions of telecommunication traffic and resources. 12. Basic transmission parameters. Notion of transmission quality. Factors limiting transmission quality and range. Notion of telecommunication chain and its characteristics. 13. Quality of Service notion; basic measures of quality for circuit and packet switched networks. Notion of traffic engineering and its goals. 14. Notion of access network, general characteristics of access network types. 15. ISO/OSI reference model and its application to description of basic functions of telecommunication networks. 16. Notion of transport system of information streams. Notion of core network and its configurations. 17. General characteristics and functions of signaling systems in digital network. Notion of signaling network. 18. Logical structure of telecommunication network: transport, signaling, synchronization, maintenance and management networks. 19. Characteristic of narrowband digital ISDN network. Notion of interface and types of interfaces. 20. Principle of providing service in connection mode in circuit switched network. Principles of connection creation. 21. Principle of providing service in connection mode in packet switched network. Principles of connection creation. 22. Characteristics of digital systems of information streams transport: plesiochronous and synchronous systems. General functions of stream switching nodes. 23. Characteristics of optical transport networks. General characteristics of optical stream switching systems. 24. Notion of network operator and his tasks. Types of operator. Notion of network maintenance and management. 25. Notion of intelligent network and its influence on increased range of services provided by network. 26. Rules of telecommunication networks cooperation. 27. Normalization regarding telecommunication networks. Goals of normalization. Norms and recommendations of international telecommunication institutions: ITU-T, ETSI, ATM Forum. 28. Directions of anticipated services development, trends in network development notion of next generation networks.</p>		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
Recommended reading	Basic literature	1. Kabaciński W., Żal M: Sieci telekomunikacyjne WKŁ 2008	
	Supplementary literature	Przegląd telekomunikacyjny i Wiadomości Telekomunikacyjne, Wyd. SIGMA NOT	
	eResources addresses		
Example issues/ example questions/ tasks being completed	<p>1. Principles of providing service "telephony" in circuit switched networks.</p> <p>2. Principles of providing service "transfer of moving pictures" in packet switched networks.</p> <p>3. Principles of circuit, packet switching nodes operation.</p> <p>4. Optical transport network elements and functions.</p>		
Practical activities within the subject	Not applicable		

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