GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Telecommunication Systems, PG_00047898		
Field of study	Informatics		
Date of commencement of studies	October 2020	Academic year of realisation of subject	2022/2023
Education level	first-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	3	Language of instruction	Polish
Semester of study	6	ECTS credits	4.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Department of Teleinformation Networks -> Faculty of Electronics, Telecommunications and Informatics		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Sylwester Kaczmarek	
	Teachers	mgr inż. Jacek Litka dr inż. Mariusz Dzwonkowski dr hab. inż. Sylwester Kaczmarek	

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	30.0	0.0	15.0	0.0	0.0	45

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	45	10.0	45.0	100

Subject objectives

Getting to know basic technologies applied in telecommunications networks, principles of the organization of the networks and phenomena which are taking place in the realization of services with diversified quality requirements.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_W03] Knows and understands, to an advanced 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 describes realization technologies of the telecommunication networks as well as by users available telecommunication services. Student explains architectures, solutions and working principles of functional elements of this networks. Student has also the skill of observation and description of event taking place on the physical, link and network level.	[SW1] Assessment of factual knowledge
[K6_U06] can analyse the operation of components, circuits and systems related to the field of study, measure their parameters and examine technical specifications	He is able to analyse situations in the telecommunications network and to make basic measurements in three first layers of the ISO/OSI model.	[SU1] Assessment of task fulfilment

Subject contents	LECTURE: Nature of the telecommunications and basic definitions. Subjects of the telecommunications market. Aims of the telecommunications market. The structure and resources of the telecommunications system. Basic functions: transmission, switching, multiplexing. Transmission mediums and parameters defining their features. Analogue and digital technology. Processing the information into the telecommunications signal. Problem of the maximization of using transmission mediums. The channel, the link, the transmission system. Circuits switching, message switching and packets switching. Telecommunications connection: connection oriented systems and connectionless oriented systems. The structure of the telecommunications network and the addressing. Connection control on the node and networks level. A signalling be needed. Signalling network. Routing function. Problem of moving of subscribers. Telecommunications services and theirs classification. Problem of the openness to the telecommunication services. The intelligent network services (IN). PSTN, IDN, ISDN, GSM - next steps of the development of the telecommunications. Transmission plain in the telecommunications. Changes on the services market and their consequences for the telecommunications. Convergence of techniques, technologies, networks and services. Access (to access nodes of services), aggregation (of information streams), transport (of streams in the core). Packets switching and IP network layer as a platform for telecommunication services (IP QoS). Architecture for integrated services – IntServ. Architecture for differentiated services – DiffServ. Generalized multiprotocol label switching – GMPLS. Layered model of the telecommunications: resources for transport services, connection control and service control, applications. Telecommunications operators and their needs: operation, maintenance, management and administration (OMMA). Future of the telecommunications as the element of the Global Information Infrastructure – GII. LAB: Physical layer for the S/T and U interface of the BRA-ISDN access. Physical layer for the E1 interface of the PCM30/32 system. Structure of the frame and multiframe of PCM30/32 system. Scenario of the service connection in PSTN/ISDN network. Signalling messages for DSS1. Signalling messages for SS7 with ISUP. Teleservices and additional services in networks with circuits switching. Teleservices and additional services in networks with packets switching. Access to broadband services in the ADSL system. The simultaneous access to services of the PSTN/ISDN networks and IP networks.
Prerequisites and co-requisites	No requirements
Assessment methods and criteria	

Subject passing criteria	Passing threshold	Percentage of the final grade
Midterm tests	50.0%	64.0%
Practical exercise	50.0%	36.0%

Recommended reading	Basic literature	Material prepared by the lecturer in the form of xeroxcopy and in electronics form as a PDF file. Manual in the form of xeroxcopy.
	Supplementary literature	No requirements.
	eResources addresses	Adresy na platformie eNauczanie: Systemy telekomunikacyjne - Moodle ID: 28845 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=28845
Example issues/ example questions/ tasks being completed		
Work placement	Not applicable	