GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Information Streams Control, PG_00048356		
Field of study	Electronics and Telecommunications, Biomedical Engineering, Biomedical Engineering, Biomedical Engineering		
Date of commencement of studies	February 2027	Academic year of realisation of subject	2027/2028
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	2.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Department of Teleinformation Networks -> Faculty of Electronics Telecommunications and Informatics -> Faculties of Gdańsk University of Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Marcin Narloch	
	Teachers	dr inż. Marcin Narloch	

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	16.0	50

Subject objectives	Accuiring knowledge of information stream control in telecommunication 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 analises and practically evaluates configuration and evaluate information streams control in different network technologies.	[SU1] Assessment of task fulfilment
[K7_W10] knows and understands, to an increased extent, the basic processes occurring in the life cycle of equipment, objects and technical systems, as well as methods of supporting processes and functions, specific to the field of study	Student identifies key problems and issues of static, hierarchical and dynamic routing for STM networks and routing including QoS routing and Traffic Engineering problems) for ATM, IP and NGN networks.	[SW1] Assessment of factual knowledge
[K7_U03] can design, according to required specifications, and make a complex device, facility, system or carry out a process, specific to the field of study, using suitable methods, techniques, tools and materials, following engineering standards and norms, applying technologies specific to the field of study and experience gained in the professional engineering environment	Student analyses and practically evaluates configuration of information streams control in different network technologies, particularly in IP, IP QoS and NGN networks.	[SU1] Assessment of task fulfilment
[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 describes issues of call, connection, congestion and traffic control in networks. Student describes notions of static, hierarchic and dynamic routing for STM and routing (including QoS routing Traffic Engineering problems) for ATM , IP and NGN networks.	[SW1] Assessment of factual knowledge

Subject contents

Course content – lecture
1. Control of call, connection, congestion and traffic 2. Relation among signalization, routing protocols and algorithms 3. Evolution of path selection methods (routing) algorithms 4. Routing with alternative paths: hierarchical and dynamic routing 5. Path selection methods in dynamic routing 6. Notion of cost in STM network routing 7. Application of Markov decision process in path selection methods 8. Learning automata in routing algorithms 9. Examples of routing algorithms implementation in STM networks 10. Routing in ATM networks and characteristics of PNNI 11. Multilevel hierarchy of PNNI topology 12. Routing metrics and algorithms in traditional IP networks 13. IGP and EGP protocols in IP networks 14. Routing in IP networks regarding quality of service - QoS routing 15. Metrics in IP QoS routing 16. QOSPF protocol 17. Constraint Based Routing as a generalization of QoS routing 18. Control and label distribution protocols in MPLS networks 19. Application of MPLS in network resource management and traffic control 20. Stream control in optical network – GMPLS/ASON 21. Concept of Softswitch as an element of call and connection control in IP QoS network

Prerequisites and co-requisites

No requirements

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Midterm colloquium	50.0%	50.0%
Reports from laboratory excercises	50.0%	50.0%

Recommended reading

Basic literature	.Material prepared by the lecturer in the form of xeroxcopy. Manual in the form of xeroxcopy.
Supplementary literature	1. Ash G. R., Traffic Engineering and QoS Optimization of Integrated Voice and Data Networks, Morgan Kaufmann, 2007. 2. Chao H. J., Gou X., Quality of Service Control in High-Speed Networks, John Wiley & Sons, 2002. 3. Farrel A., Internet and its protocols. A comparative approach. Morgan Kaufmann, 2006. 4. Guichard J., Le Faucheur F., Vasseur J.-P., Definitive MPLS Network Designs, , Cisco Press, 2005. 5. Halabi S., McPherson D., Internet Routing Architectures (2nd ed.), Cisco Press, 2000. 6. Perros H., Connection-oriented Networks SONET/SDH,ATM,MPLS and OPTICAL NETWORKS, John Wiley & Sons, 2005. 7. Pióro M., Medhi D., Routing, Flow, and Capacity Design in Communication and ComputerNetworks, Morgan Kaufmann, 2004. 8. White R., Retana A., IS-IS: Deployment in IP Networks, Addison Wesley. 2002
eResources addresses	

Example issues/ example questions/ tasks being completed	
Practical activites within the subject	Not applicable

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