GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Multiservice IP Architectures, PG_00048062						
Field of study	Informatics, Biomedical Engineering, Biomedical Engineering, Biomedical Engineering						
Date of commencement of studies	February 2023		Academic year of realisation of subject	2023/2024			
Education level	second-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	2		Language of instruction	Polish			
Semester of study	3		ECTS credits	3.0			
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. Jacek Rak					
	Teachers	dr hab. inż. Jacek Rak					
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	0.0	15.0	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		6.0	39.0	75	
Subject objectives	Understanding the reasons for the evolution of the network to the next generation of networks, deep understanding of the IP Multimedia Subsystem (IMS) architecture, IMS services and applications, understanding the concept of creating new services and applications in the IMS environment						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K7_U04] can apply knowledge of programming methods and techniques as well as select and apply appropriate programming methods and tools in computer software development or programming devices or controllers using microprocessors or programmable elements or systems specific to the field of study, making assessment and critical analysis of the prepared software as well as a synthesis and creative interpretation of information presented with it	Student is able to design and implement an application providing services for IP networks based on the Parlay OSA architecture in accordance with the idea of object-oriented programming	[SU5] Assessment of ability to present the results of task [SU4] Assessment of ability to use methods and tools [SU3] Assessment of ability to use knowledge gained from the subject [SU2] Assessment of ability to analyse information [SU1] Assessment of task fulfilment
	[K7_W42] Knows and understands, to an increased extent, the principles and trends in the analysis and design of local and distributed IT systems and the basics of computer modeling and computerization of complex cognitive and decision-making processes.	The student knows the trends in the development of IP network architectures as well as the trends in the evolution of services in IP networks	[SW1] Assessment of factual knowledge
	[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.	The student knows the principles of operation of cellular networks and wireless networks. The student knows the protocol solutions enabling the provision of various services in IP networks. The student knows the IMS security architecture.	[SW1] Assessment of factual knowledge
	[K7_W04] Knows and understands, to an advanced extent, the principles, methods and techniques of programming and the principles of computer software development or programming devices or controllers using microprocessors or programmable elements or systems specific to the field of study, and organisation of systems using computers or such devices	The student knows the IMS security architecture. The student knows the architecture of Parlay OSA. The student knows the principles of designing network applications for the IP environment	[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	The student is able to design and implement the communication and service provision system based on the possibilities of the Parlay OSA architecture	[SU5] Assessment of ability to present the results of task [SU4] Assessment of ability to use methods and tools [SU3] Assessment of ability to use knowledge gained from the subject [SU2] Assessment of ability to analyse information [SU1] Assessment of task fulfilment

<table>
<tr><td>Subject contents</td><td>Lecture:
1. Telecommunications services and applications.
2. Internet development. The evolution of services and applications.
3. Convergence of information technology, media and telecommunications.
4. The evolution of the network towards NGN.
5. Assumptions of the NGN network.
6. Evolution of cellular networks. First IMS specifications.
7. Evolution of wireless networks.
8. The evolution of services and technologies, the need for change.
9. The new role of telecommunications. New service architectures.
10. Motivation for establishing IMS.
11. IMS architecture.
12. Layers of the IMS platform.
13. Basic elements of the IMS platform.
14. Basic scenarios for the operation of IMS; reference points.
15. Attendance service.
16. Messenger service,
17. Push-to-talk over Cellular (PoC) service.
18. Conference services. Group management.
19. IMS scenarios: registration, selected services
20. SIP architecture: component protocols and services.
21. RTP, RTCP, RTSP protocols.
22. Scenarios for the operation of SIP signaling.
23. ENUM 24. Creating ENUM domains.
25. Types of ENUM.
26. IMS security.
27. IPSec protocol and its use in IMS
28. Use of the Diameter protocol.
29. Implementation of telecommunications services on the IMS platform.
30. IMS development prospects.

Project:
Group task carried out in teams of 3-4 people in the field of design and implementation of the application providing services in the IP network based on the Parlay OSA architecture</td></tr>
<tr><td>Prerequisites and co-requisites</td><td>none</td></tr>
<tr><td>Assessment methods and criteria</td><td>
<table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>project</td><td>50.0%</td><td>50.0%</td></tr>
<tr><td>written exam</td><td>50.0%</td><td>50.0%</td></tr>
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<tr><td>Recommended reading</td><td>
<table>
<tr><td>Basic literature</td><td>Author's lecture materials</td></tr>
<tr><td>Supplementary literature</td><td>M. Poikselka, G. Mayer, H. Khartabil, A. Niemi : "The IMS: IP Multimedia Concepts and Services", Wiley, 2006</td></tr>
<tr><td>eResources addresses</td><td>Adresy na platformie eNauczanie:</td></tr>
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<tr><td>Example issues/ example questions/ tasks being completed</td><td></td></tr>
<tr><td>Work placement</td><td>Not applicable</td></tr>
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