GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Signalling Systems and Protocols, PG_00048153		
Field of study	Electronics and Telecommunications		
Date of commencement of studies	October 2023	Academic year of realisation of subject	2026/2027
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	4	Language of instruction	Polish
Semester of study	7	ECTS credits	4.0
Learning profile	general academic profile	Assessment form	exam
Conducting unit	Department of Teleinformation Networks -> Faculty of Electronics, Telecommunications and Informatics		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Marcin Narloch	
	Teachers	dr inż. Marcin Narloch	

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	4.0	51.0	100

Subject objectives

Obtaining knowledge regarding communication and signalling protocols used in circuit switching and packet networks particularly for VoIP technology.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_W35] Knows the concepts of the technique of signal transmission, operation of telecommunications networks and multimedia services and the rules for providing them	Student knows communication and signalling protocols used in circuit and packed switched networks, particularly for VoIP technology.	[SW1] Assessment of factual knowledge
[K6_U31] can identify telecommunications network architectures, differentiates their areas and functional elements, evaluates the quality of service delivery, calculates parameters of functional elements	Student analyses connection scenarios for typical signalling systems and protocols. Student recognizes messages content and evaluates their correctness. Student uses tools for signalling analysis.	[SU2] Assessment of ability to analyse information [SU4] Assessment of ability to use methods and tools

Subject contents

1. Notion and classification of communications protocols 2. Notion and classification of signaling systems; communications protocols in signaling systems 3. Functions of communications protocols in OSI and Internet architecture 4. Protocols and protocol stacks in IP network 5. Characteristics and functions of physical layer protocols. 6. Characteristics and functions of data link layer protocols (LAPB, LAPB,PPP). 7. Characteristics, functions and procedures of network layer protocols 8. Characteristics, functions and procedures of network transport layer protocols: TCP, UDP 9. Characteristics and functions protocols to support routing functions BGP, OSPF 10. Characteristics, functions and procedures RSVP protocol 11. Protocols in MPLS networks. 12. Signalization systems for PSTN/ISDN telecommunication networks: DSS1 and SS7 13. Signalization system DSS1: functions, types and structures of signalling messages 14. Signalization system DSS1: basic signalization procedures. 15. Signalization system SS7. Signalling network architecture 16. Signalization system SS7 ISUP: functions, types and structures of signalling messages 17. Basic signalization procedures for PSTN/ISDN network. 18. Signalization system SS7 MAP. Messages and basic signalization procedures 19. Signalization system SS7: SCCP and TACP protocols. Messages and basic signalization procedures 20. Call handling scenarios for signalization network 21. Signaling protocols utilized in VoIP technology 22. H.323 standard: types and structures of signalization messages 23. Basic call handling procedures in H.323 24. Cooperation between network with SS7 ISUP and IP network 25. Signaling protocol SIP: functions , types and structures of signalization messages. 26. Basic call handling procedures in SIP. 27. Cooperation between SIP and H.323 28. Signaling protocol NSIS 29. Standard of MGCP protocol: messages, functions and structure, API parameters 30. Basic call handling procedures in MGCP

<table>
<tr><td>Prerequisites and co-requisites</td><td colspan="3">no requirements</td></tr>
<tr><td>Assessment methods and criteria</td><td colspan="3"><table><tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr><tr><td>exam</td><td>50.0%</td><td>60.0%</td></tr><tr><td>laboratory exercises</td><td>50.0%</td><td>40.0%</td></tr></table></td></tr>
<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td colspan="2">Material prepared by the lecturer in the form of xeroxcopy. Manual in the form of xeroxcopy.</td></tr>
<tr><td>Supplementary literature</td><td colspan="2">1. Bromirski M. ,Telefonia VoIP,. Wydawnictwo BTC, Warszawa 2006.

2. Johnston A. B., SIP: Understanding the Session Initiation Protocol, Artech House 2009.

3. Danilewicz G., Kabaciński M., System sygnalizacji nr 7 Protokoły standaryzacja zastosowania, WKiŁ 2005.</td></tr>
<tr><td>eResources addresses</td><td colspan="2">Adresy na platformie eNauczanie:</td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td colspan="3"></td></tr>
<tr><td>Work placement</td><td colspan="3">Not applicable</td></tr>
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