

Subject card

Subject name and code	Advanced Network Technologies, PG_00179331						
Field of study	Informatics						
Date of commencement of studies	October 2023		Academic year of realisation of subject		2025/2026		
Education level	Bachelor's studies		Subject group		Obligatory subject group in the field of study 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		6.0		
Learning profile	academic		Assessment form		exam		
Conducting unit							
Name and surname of lecturer (lecturers)	Subject supervisor		dr Adam Kostulak				
	Teachers		dr Adam Kostulak				
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	30.0	0.0	0.0	60
	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	60		0.0		0.0	60
Subject objectives	This course focuses on switching technologies and router operation that support small- and medium-sized business networks and covers wireless local area networks (WLANs) and security concepts. It presents key switching and routing concepts, as well as architectures and issues related to designing, securing, operating, and troubleshooting enterprise networks. The course also covers wide area network (WAN) technologies and quality of service (QoS) mechanisms used for secure remote access. Software-defined networks, virtualization, and automation, which support network digitization, will be discussed. Students will gain skills in configuring and troubleshooting scalable networks and learn how to identify and protect against cybersecurity threats. They will learn network management tools and key software-defined network concepts, including driver-based architecture and how application programming interfaces (APIs) enable network automation. Completion of this course leads to the CCNA certification in CCNAv7: Switching, Routing, and Wireless Fundamentals and CCNAv7: Enterprise Networks, Security, and Automation.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[INFL3_U07] uses advanced functionalities of operating systems, especially related to network aspects		Constructs physical connections between devices of the second layer of the ISO/OSI model Analyzes the configuration, detecting possible errors and problems		[SU4] test/exam - oral or written		
	[INFL3_W08] has knowledge of network technologies, including basic communication protocols, security and construction of network applications		Characterizes RIP, OSPF, and EIGRP routing protocols Assesses the correct operation of the local network and plans its development Configures routing protocols		[SW4] test/exam - oral or written		
Subject contents	Switching Concepts, Inter-VLAN Routing, STP, EtherChannel, FHRP Concepts, LAN and WAN Security Concepts, WLAN Concepts, Single-Area and Inter-Area Routing Concepts (OSPFv2, BGP), ACL Concepts, NAT for IPv4, VPN and IPsec Concepts, Network Virtualization, Cloud Computing, Software-Defined Networking, Controllers in Network Programming						

Prerequisites and co-requisites	Sieci komputerowe		
	Systemy operacyjne		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
		51.0%	100.0%
Recommended reading	Basic literature	Cisco Networking Academy, Routing and Switching Essentials Companion Guide, Cisco Press, Indianapolis 2014	
	Supplementary literature	Cisco Networking Academy, Routing and Switching Essentials Companion Guide, Cisco Press, Indianapolis 2014	
	eResources addresses		
Example issues/ example questions/ tasks being completed	.		
Work placement	Not applicable		

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