COURSE DESCRIPTION

Course code	full-time studies	
	part-time-studies	
Course name	**Sieci korporacyjne**	
Course name in English	**Enterprise networks**	
Valid from academic year	**2022/23**	

PLACEMENT IN THE TEACHING PROGRAM

Field of study	**Computer Science**
Level of education	**1st degree**
Studies profile	**General**
Form and method of teaching classes	**Full-time and part-time studies**
Specialization	**Information and communication technology**
Organizational unit responsible for the course	**Chair of Informatic Systems**
Course coordinator	**Dr Radoslaw Belka, Eng.**
Approved by	**Dean of the Faculty of Electrical Engineering, Automatic Control and Computer Science Roman Deniziak, KUT prof., DSc, PhD**

GENERAL CHARACTERISTIC OF THE COURSE

Course affiliation		**Specialty**
Course status		**Obligatory**
Language		**English**
Semester	full-time studies	**VI**
	part-time-studies	**VI**
Requirements		**Computer Networks, Routing and Switching Essential**
Exam (YES/NO)		**YES**
ECTS		**5**

Course form		lecture	classes	laboratory	project	other
Hours per semester	full-time studies	**30**	**-**	**30**	**-**	**-**
	part-time-studies	**18**	**-**	**18**	-	**-**

LEARNING RESULTS

Category	Result Symbol	Learning Results	References to the field of study results
Knowledge	W01	Student knows and understands the issues of designing and managing corporate networks. Student also understands the importance and role of quality of service (OoS), virtualization and automation of network functions.	INF_W30
	W02	Student knows and understands the process of configuring advanced routing protocols, access control lists (ACLs) and address translation in computer networks.	INF_W30
	W03	Student knows and understands the specifics of WAN technology and issues of virtual private networks (VPN).	INF_W30
Skills	U01	Student can configure advanced routing protocols, ACL access control lists and NAT address translation mechanisms.	INF_U30
	U02	Student can design and build a wide area network with its security.	INF_U30
	U03	Student can solve typical problems encountered in ICT networks..	INF_U30
Social competence	K01	Student is ready to undertake activities in the field of implementing corporate network solutions	INF_K1 INF_K2
	K02	Student is ready to work and cooperate in a group in the field of configuring corporate networks	INF_K1 INF_K2

COURSE CONTENT

Course Form	Content
lecture	1. Designing corporate networks with regard to scalable multi-layer infrastructure 2. Integrating network protocols in multilayer architecture. Network tuning and optimization. 3. Advanced link state routing protocols. Configuration of the open OSPF protocol in single and multi-area variants. 4. Address translation mechanism for IPv4 (NAT) and its impact on routing mechanisms. 5. The role of access control lists (ACLs) in corporate networks. Configuration of access control lists. Network design with ACL. 6. Concepts and role of WAN networks. Popular WAN technologies. LAN-WAN integration. 7. Network virtualization issues. Configuring tunnels and defining private networks in the infrastructure of public networks. 8. ICT network management techniques. Network monitoring and maintenance. 9. Automation of network functions.

laboratory	1. Designing advanced corporate networks. Integration of network solutions. 2. Tuning and optimizing the network. 3. Configuration of advanced link state routing protocols on the example of open OSPF protocol. 4. Configure Standard and Extended ACLs for IPv4/IPv6. 5. Static and dynamic NAT configuration. 6. Configuration of VPN virtual private networks. Establishing tunnels. 7. Research and application of telecommunications network management techniques. 8. Solving common problems in corporate networks.

LEARNING RESULTS VERIFICATION METHODS

Result Symbol	Learning results verification methods					
	Oral Exam	Written Exam	Midterm	Project	Report	Other
W01		X				
W02		X				
W03		X				
U01			X			
U02			X			
U03			X			
K01		X	X			
K02		X	X			

ASSESSMENT FORMS AND CRITERIA

Course Form	Assessment Form	Assessment Criteria
lecture	assessments	Passing the assessments (at least 50% of the total point)
laboratory	assessments	Handlab realization of all recommended laboratory exercies. Passing the integration challenge tasks (at least 50% of the total point)

STUDENT'S VOLUME OF WORK

ECTS Balance												
No.	**Activity Type**	**Student Involvement**										**Unit**
		full-time studies					**part-time-studies**					
1.	Participation in classes according to the schedule	Lec	C	Lab	P	S	Lec	C	Lab	P	S	
		30		30			18		18			h
2.	Other (consultations, exams)	4		2			4		2			h
3.	**Total with the direct assist of an academic teacher**	**66**					**42**					h
4.	**Number of ECTS, that students obtains with the direct assist of an academic teacher**	**2,64**					**1,68**					ECTS
5.	**Hours of unassisted student work**	**59**					**83**					h

6.	Number of ECTS that student obtains working unassisted	2,36	3,32	ECTS
7.	Practical classes volume of work	30	18	h
8.	Number of ECTS obtained by student at practical classes	1,2	0,72	ECTS
9.	Total student's volume of work expressed in hours	125	125	h
10.	ECTS	5		ECTS

BIBLIOGRAPHY

1. A. Johnson, Enterprise Networking, Security, and Automation Labs and Study Guide (CCNAv7), Published by Cisco Press (2020)
2. B. Hartpence, „Packet Guide to Routing and Switching", O'Reilly Media, Inc., 2011
3. A. S. Tanenbaum, D.J. Wetheral, „Computer Networks", Pearson, 5th edition
4. NetAcad curiculum available for enrolled students