



COURSE DESCRIPTION

Course code	full-time studies	X
	part-time-studies	X
Course name	Technologie sieciowe transportu informacji	
Course name in English	Network Technologies for Information Transport	
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	Computer graphics / Information systems
Organizational unit responsible for the course	Department of Information Systems
Course coordinator	Jacek Wilk-Jakubowski
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	Directional course	
Course status	Elective	
Language	English	
Semester	full-time studies	Semestr VI
	part-time-studies	Semester VII
Requirements	Fundamentals of Electronics Probabilistic methods and statistics Introduction to Networks	
Exam (YES/NO)	NO	
ECTS	4	

Course form		lecture	classes	laboratory	project	other
Hours per semester	full-time studies	30	15		15	
	part-time-studies	18	9		9	

LEARNING RESULTS

Category	Result Symbol	Learning Results	References to the field of study results
Knowledge	W01	Student knows and understands the selected problems of mathematical analysis and linear algebra, selected probabilistic methods and basics of mathematical statistics, selected problems of discrete mathematics.	INF_W03
	W02	Student has advanced knowledge and understanding of local and wide area networks, active and passive network components, reference models, basic communication protocols and security aspects of computer networks.	INF_W15
Skills	U01	Student is able to use the apparatus of mathematical analysis, calculate probabilities of events, interpret concepts from the field of computer science in terms of functions and relations, apply the apparatus of logic, techniques of proving theorems, graph theory and recursion to solve problems of computer science.	INF_U03
	U02	Student is able to perform basic computer network configuration and diagnostics, design his own application protocols and build simple Internet applications using popular protocols.	INF_U15
Social competence	K01	Student is ready to recognize the significance of knowledge in solving engineering problems and the need for its continuous expansion to improve professional, personal and social competences.	INF_K1
	K02	Student is ready to critically evaluate his/her qualifications and understands the potential consequences of decisions/actions taken on the basis of incomplete knowledge/poor skills.	INF_K2

COURSE CONTENT

Course Form	Content
lecture	1, 2. Network technologies for information transport. Basic terms. Overview of teletransmission systems (PDH, SDH, SONET, NG SDH, OTH). 3-6. Multiplication mechanisms. Overview, frame structure. Flow rate equalization in digital systems. Transport modules. 7. Mapping procedures. The 'master-slave' architecture. 8, 9. Types of devices used. 10-12. Ring structures (unidirectional ring, bidirectional ring). 13. Multi-ring structures. 14, 15. Management and operation of teletransmission systems.
classes	1-3. Information theory. Computing traffic flow. Network latency and congestion. 4, 5. Determining the intensity of requests, service and stability of systems. 6, 7. State graphs. Calculating probabilities of events.
project	Assignment of a task on designing, synchronizing, using, managing and operating PDH, SDH, SONET, NG SDH or OTH teletransmission systems and tracts (wired and wireless) built on their basis. The assignment is to be completed in groups of 3-5. Presentations are given as a part of the project class.

LEARNING RESULTS VERIFICATION METHODS

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

ASSESSMENT FORMS AND CRITERIA

Course Form	Assessment Form	Assessment Criteria
lecture	Passing grade	Obtain min. 50% of the points in the final written/oral colloquium.
classes	Passing grade	Obtain min. 50% of the points in the final written/oral colloquium.
project	Passing grade	Defense of the project (personal demonstration with skillful explanation) for a positive grade.

STUDENT'S VOLUME OF WORK

ECTS Balance												
No.	Activity Type	Student Involvement										Unit
		full-time studies					part-time-studies					
		Lec	C	Lab	P	S	Lec	C	Lab	P	S	
1.	Participation in classes according to the schedule	30	15	-	15	-	18	9	-	9	-	h
2.	Other (consultations, exams)	2	2	-	2		2	2	-	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	34					58					h
6.	Number of ECTS that student obtains working unassisted	1,36					2,32					ECTS
7.	Practical classes volume of work	30					18					h
8.	Number of ECTS obtained by student at practical classes	1,82					1,71					ECTS
9.	Total student's volume of work expressed in hours	100					100					h
10.	ECTS	4										ECTS

BIBLIOGRAPHY

1. Dąbrowski A., Kula S. Systemy i sieci SDH. Warszawa 1996.
2. Kartalopoulos Stamatios V. Understanding SONET/SDH and ATM: Communications Networks for the Next Mellennium, IEEE Press Understanding Science Technology Series, Wiley-IEEE Press, 1999.
3. Kabaciński W., Żal M. Sieci telekomunikacyjne, WKŁ, Warszawa 2016.
4. Kula S. Systemy teletransmisyjne, WKŁ, Warszawa 2015.
5. Wajda K. Sieci szerokopasmowe, Wyd. FPT, Kraków 2000.
6. Wesółowski, K. Podstawy cyfrowych systemów telekomunikacyjnych, WKŁ, Warszawa 2006.