



## Subject card

Subject name and code	Communication Software for Internet of Things, PG_00048059						
Field of study	Informatics, Electronics and Telecommunications, 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	1	Language of instruction			Polish		
Semester of study	2	ECTS credits			4.0		
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 inż. Wojciech Gumiński				
	Teachers		dr inż. Wojciech Gumiński				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	15.0	15.0	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		8.0		47.0	100
Subject objectives	The aim of the course is to enable students to acquire knowledge and practical skills in the field of methods of designing and implementing communication protocols.						

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	Students implement unicast and multicast communication protocols using IPv4 and IPv6 protocols.	[SU3] Assessment of ability to use knowledge gained from the subject [SU1] Assessment of task fulfilment
	[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	Students describe the operation of communication protocols in the SDL language.	[SW3] Assessment of knowledge contained in written work and projects
	[K7_U41] can select methods of modelling and analysis of information systems and applications using selected elements of theoretical computer science and modern programming tools	Students describe the rules for implementing communications using the socket interface.	[SU1] Assessment of task fulfilment
	[K7_W41] Knows and understands, to an increased extent, the standards, production methods, life cycle and development trends of software as well as information systems and applications.	Students describe the special features of the communication software.	[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.	Students describe elements of the Internet of things architecture .	[SW1] Assessment of factual knowledge
Subject contents	<ol style="list-style-type: none"> <li>1. Introduction, IoT architecture</li> <li>2. Definition of communication software</li> <li>3. Introduction to the SDL language, basic features of the SDL language, graphic and text notations of elements of the SDL language</li> <li>4. Model and structure of the SDL schema</li> <li>5. Methods of describing the processes using SDL</li> <li>6. Communication and data transmission between processes</li> <li>7. Validation of protocols and compliance tests</li> <li>8. Implementation of SDL projects using popular programming languages</li> <li>9. Application of SDL notation on the design of an exemplary protocol</li> <li>10. Use of communication sockets to implement network communication tasks</li> <li>11. Methods of implementing network protocols using the idea of processes and mechanisms of communication between them</li> <li>12. Methods of implementing mechanisms to preserve data integrity</li> <li>13. Methods of implementing mechanisms for verification of compliance with a traffic contract</li> <li>14. Implementation of security mechanisms for communication protocols</li> <li>15. Postulates of group communication</li> </ol>		
Prerequisites and co-requisites			

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Project	50.0%	33.0%
	Practical exercises	50.0%	33.0%
	Test	50.0%	34.0%
Recommended reading	Basic literature	Notes from lectures	
	Supplementary literature	Stevens R.; Unix Programowanie usług sieciowych, WNT 2002	
	eResources addresses	Adresy na platformie eNauczenie:	
Example issues/ example questions/ tasks being completed	<p>Design of communication protocol.  Implementation of unicast communication.  Implementation of multicast communication.</p>		
Work placement	Not applicable		