

**Subject card**

<b>Subject name and code</b>	Web Protocols, PG_00204166						
<b>Field of study</b>	Informatics						
<b>Date of commencement of studies</b>	October 2026	<b>Academic year of realisation of subject</b>			2027/2028		
<b>Education level</b>	Bachelor's studies	<b>Subject group</b>			Obligatory subject group in the field of study Subject group related to practical vocational preparation		
<b>Mode of study</b>	full-time studies	<b>Mode of delivery</b>			at the university		
<b>Year of study</b>	2	<b>Language of instruction</b>			Polish		
<b>Semester of study</b>	3	<b>ECTS credits</b>			3.0		
<b>Learning profile</b>	practical	<b>Assessment form</b>			credit		
<b>Conducting unit</b>	Institute of Informatics -> Faculty of Mathematics, Physics and Informatics -> Rector						
<b>Name and surname of lecturer (lecturers)</b>	<b>Subject supervisor</b>		dr Adam Kostulak				
	<b>Teachers</b>						
<b>Lesson types</b>	<b>Lesson type</b>	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	<b>Number of study hours</b>	15.0	0.0	15.0	0.0	0.0	30
	E-learning hours included: 0.0						
<b>Learning activity and number of study hours</b>	<b>Learning activity</b>	Participation in didactic classes included in study plan		Participation in consultation hours		Self-study	SUM
	<b>Number of study hours</b>	30		0.0		45.0	75
<b>Subject objectives</b>	The aim of the course is to familiarize students with selected protocols used in the implementation of computer systems, mainly web applications.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[INFPL3_U07] is able to use his knowledge to select the type of database depending on needs, create an adequate model and use it		
	[INFPL3_W05] knows and understands advanced concepts related to the design and use of databases; applies this knowledge when designing and implementing relational and non-relational databases, query optimization and system integration		
	[INFPL3_U06] can take care of data security, including secure transmission; uses data compression and encryption tools	understands the problem of sending data in clear text, is able to apply appropriate techniques ensuring, among others, data confidentiality and integrity, public key cryptography and symmetric encryption. Knows TLS and SSH protocols, can use public key infrastructure and generate TLS certificates	[SU2] presentation/project/paper/report [SU4] test/exam - oral or written
	[INFPL3_W06] knows and understands the theory and methods to an advanced degree in the field of operating systems, network technologies including basic web communication protocols; applies this knowledge to configure, optimize and secure systems	has knowledge of the technology stack used in communication protocols, with particular emphasis on the HTTP and MQTT protocols	[SW4] test/exam - oral or written [SW2] presentation/project/paper/report
	[INFPL3_U05] is able to perform tasks and solve complex and unusual problems in the area of advanced functionalities of operating systems, in particular related to network aspects, virtualization, containerization and other cloud technologies	in the implementation of IT systems, it uses functionalities related to the operation of network interfaces by the operating system	[SU2] presentation/project/paper/report [SU4] test/exam - oral or written
[INFPL3_W07] knows and understands facts and methods to an advanced degree in the field of designing, developing, testing, implementing and maintaining web applications and their security; applies this knowledge in practical projects, creating web applications and preparing their functional and performance tests	can design, test and develop web applications using HTTP REST and Pub/Sub MQTT patterns and ensure data confidentiality and integration and server authentication using the TLS protocol	[SW4] test/exam - oral or written [SW2] presentation/project/paper/report	
Subject contents	<ul style="list-style-type: none"> <li>network interfaces and their support in the operating system</li> <li>OSI model</li> <li>asymmetric and symmetric encryption, public key infrastructure</li> <li>use of advanced SSH functionalities, tunneling</li> <li>HTTP protocol and REST pattern</li> <li>MQTT protocol and Pub/Sub pattern</li> <li>securing communication, TLS protocol, generating and obtaining certificate</li> </ul>		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	test	51.0%	5.0%
	project	51.0%	95.0%
Recommended reading	Basic literature	Learning HTTP/2. A Practical Guide for Beginners, aut. Stephen Ludin, Javier Garza, ISBN 9781491962602	
	Supplementary literature	TCP/IP w 24 godzin, aut. Joe Casad, ISBN 9788328337084	
	eResources addresses		
Example issues/ example questions/ tasks being completed			

Work placement	Not applicable
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