University of Gdańsk

Subject card

Subject name and code	Web Protocols, PG_00204166						
Field of study	Informatics						
Date of commencement of studies	October 2026		Academic year of realisation of subject	2027/2028			
Education level	Bachelor's studies		Subject group	Obligatory subject group in the field of study Subject group related to practical vocational preparation			
Mode of study	full-time studies		Mode of delivery	at the university			
Year of study	2		Language of instruction	Polish			
Semester of study	3		ECTS credits	3.0			
Learning profile	practical		Assessment form	credit			
Conducting unit	Institute of Informatics -> Faculty of Mathematics, Physics and Informatics -> Rector						
Name and surname of lecturer (lecturers)	Subject supervisor		dr Adam Kostulak				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	15.0	0.0	0.0	30
	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	30		0.0		45.0	75
Subject objectives	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	They can select the appropriate database type for the nature of the problem and the type of data being processed. They can design an appropriate data model that meets the requirements of the system being designed.	[SU4] test/exam - oral or written
[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	Can select effective solutions for data storage in terms of API communication efficiency in web applications	[SW4] test/exam - oral or written
[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 ant 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

- network interfaces and their support in the operating system
- OSI model
- asymmetric and symmetric encryption, public key infrastructure
- use of advanced SSH functionalities, tunneling
- HTTP protocol and REST pattern
- MQTT protocol and Pub/Sub pattern
- securing communication, TLS protocol, generating and obtaining certificate

Prerequisites and co-requisites

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
test	51.0%	20.0%
project	51.0%	80.0%

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 godziny, aut. Joe Casad, ISBN 9788328337084
eResources addresses	

Example issues/ example questions/ tasks being completed	
Work placement	Not applicable

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