Course Syllabus

Course from study programme for the cycle: 2022/2023

I. General Information

Course name	Web services programming
Programme	Informatisc
Level of studies (BA, BSc, MA, MSc, long-cycle MA)	BA
Form of studies (full-time, part-time)	full-time
Discipline	Informatisc
Language of instruction	English

Course coordinator	Rafał Stęgierski, PhD

Type of class *(use only the types mentioned below)*	Number of teaching hours	Semester	ECTS Points
lecture			3
tutorial			
classes			
laboratory classes	30	V	
workshops			
seminar			
introductory seminar			
foreign language classes			
practical placement			
field work			
diploma laboratory			
translation classes			
study visit			

Course pre-requisites	Ability to programming in C/C++ and library usage Ability to track code invocation

II. Course Objectives

C1 - Acquaint students with the principles of creating network services
C2 - Familiarise students with the methods of exchanging information between network services and client applications using different network protocols such as HTTP,TCP, UDP
C3 - Create client applications in object-oriented languages based on the documentation provided
C4 - Presentation of different architectures to create web applications, such as client-server, P2P, SOA

III. Course learning outcomes with reference to programme learning outcomes

Symbol	Description of course learning outcome	Reference to programme learning outcome
KNOWLEDGE		
W_01	Know protocol stack and can project own protocol at application layer. Know how different types of network communication looks like.	K_W06
SKILLS		
U_01	Know how to work with RFC documents and whitepapers.	K_U02
SOCIAL COMPETENCIES		
K_01	Student knew her/his limitations and direction of development for becoming better developer or project manager	K_K01
K_02	Know how to select and use proper IT tools and know treats connected with them	K_K05

IV. Course Content

Course contents:
1. Services and configuration
2. TCP/IP stack
3. HTTP, HTTP/2
4. Creating a client to web service
5. Diferent types of hosting
6. Errors handling
7. Transferring objects over the network
8. Sessions
9. Security of web services
10. REST and RESTful

V. Didactic methods used and forms of assessment of learning outcomes

Symbol	Didactic methods *(choose from the list)*	Forms of assessment *(choose from the list)*	Documentation type *(choose from the list)*
KNOWLEDGE			
W_01	Brainstorming/discussion group	Observation	Report file
SKILLS			
U_01	Project-based learning design thinking	Preparation of the project	Project rating card
SOCIAL COMPETENCIES			
K_01	Brainstorming/discussion group design thinking	Observation	Protocol
K_02	Brainstorming/discussion	Observation	Protocol

	group design thinking		

VI. Grading criteria, weighting factors.....

- On the grade 3 student:

W1 - knows the TCP / IP protocol stack and understands the functionalities associated with each of the layers that make up it
W2 - knows the protocols related to data transport at the level of the TCP / IP stack and the mechanisms used to control transmission, detect and handle errors
W3 - understands the concept of service port and its meaning at the level of network communication
W4 - knows the concept of stateless communication in the context of the HTTP protocol
W5 - can characterize the GET and POST methods of the HTTP protocol
U1 - can consciously use the description of protocols under the Internet standards in RFCs
U2 - can create a network client application based on socket support in accordance with Berkey Socket
K1 - is able to communicate in order to establish guidelines related to the implementation of network protocols and mechanisms
K2 - understands the need to broaden his knowledge and refer to documentation in the case of implementing network solutions

For the grade 4 student:
W1 - knows the differences between HTTP / 1.1 and HTTP2
W2 - knows what methods besides GET and POST are used in HTTP communication and is able to indicate their use in various cases
W3 - knows the concept associated with the Berkley Socket library and derivatives
W4 - knows how to create a connection using socket libraries
U1 - can design a communication protocol and implement it

For the grade 5 student:
W7 - knows how to create a connection using socket libraries for advanced network mechanisms
U1 - can design a server with support for many clients
U2 - can create an HTTP connection based on low-level and high-level libraries

VII. Student workload

Form of activity	Number of hours
Number of contact hours (with the teacher)	30
Number of hours of individual student work	80

VIII. Literature

Basic literature
Karanjit S. Siyan, Tim Parker, TCP/IP. Księga eksperta. Wydanie II Mark Masse, REST API Design Rules.
Additional literature

RFC documents: 793, 1180, 2616, 7230-7232, 7540, 5531