WEB APPLICATIONS DEVELOPMENT IN JAVA

Faculty of Computer Science				
Study programme:	**Computer Science**		Degree level:	**Engineer's degree full-time programme**
Specialization	**---**		Diploma path:	**2026/2027W - 2026/2027S**
Module name:	**Web Applications Development in Java** (Programowanie aplikacji WWW w technologii Java)			
Module type:	**obligatory**	**Semester: 2**	ECTS:**5**	Module ID:**FCS-00046**
No. of hrs in semester:	Lecture (L) - **26** Classes(C) - **0** Specialization workshop (SW) - **30** Project (P) - **0** Laboratory classes (LC) - **0** Seminar (S) - **0**			
Prerequisites	Databases (FCS-00108), Object Oriented Programming (FCS-00012), Computer Networks (FCS-00026),			

Aims and objectives:	To familiarise students with the World Wide Web's architecture, its operating model and basic protocols. To present the concept of WWW applications, a cross-section of techniques and programming patterns used within the information network. Mechanisms of sessions, cookies, and request parameters. Acquiring knowledge and skills in developing web applications using technologies based on the Java EE specification (Java Servlets, Spring framework). Reference to the SFIA standard: Programming/software development PROG - level 3 Software design SWDN - level 3 Testing TEST - level 1		
Forms of teching activities::	lecture, specialization workshop,	Assessment:	Evaluation must be relevant to the intended learning outcomes: Lecture: written test. Specialized workshop: implementation tasks and Web application projects in Spring technology.
Module content:	Lecture: Web applications in Java - servlets. Architecture of the World Wide Web. The concept of WWW applications. Application definition and distribution tasks Web application elements related to data exchange. Web application context. Cookies and sessions Application event model. Filters. Listening classes Servlet container management. Application security. REST (Representational state transfer) architecture Libraries based on the Serlvets specification: SpringMVC+Thymeleaf. Automatic configuration using Spring Boot Project structure and elements Thymeleaf views Using annotations and Dependency Injection technology Spring Data. Data entry and validation Spring Security Programming techniques and patterns used in web application development Written test Specialized lab: Organizational classes Preparing the development and production environment of an application Managing a servlet container Implementing a Web application in Java based on servlets. Web application elements related to data exchange Web application context. Application event model MVC pattern implementation. REST interface, databases Application development based on the Spring framework Using the Spring Boot library for rapid application development and dependencies Annotations and DI Spring Data. Data entry and validation Thymeleaf Views Thymeleaf Views. User interface accessibility Authentication and authorization of access to resources Application testing Project presentation and evaluation		
Teaching methods:	project method, subject exercises, programming, brainstorming, lecture problem, talk,		

Learning outcomes		
Symbol	Specify min. 4, max. 8 learning outcomes in the following order: knowledge – skills – competence. Each learning outcome must be verifiable	Reference to the programme learning outcomes of education
E1	the architecture of the Web and identifies and explains the principles of operation of protocols and standards for the environment.	INF1_W08 INF1_W13
E2	the principles of design and web application development	INF1_W04 INF1_W11
E3	the popular elements of technology used to create web applications. Can select the right technology for the specifics of the project.	INF1_W07 INF1_W09
E4	carry out testing of Web application components and diagnose errors.	INF1_U06
E5	design and implement a web application in selected technology and the needs of the user.	INF1_U04 INF1_U05 INF1_U07 INF1_U11

E6	install and configure the environment necessary to run the Web application (server and tools required on the client side).	INF1_U08
E7	design and implement a web application in the selected technology taking into account the needs of the user and optimized in terms of resources used	H1_K03

No. of learning outcome	Methods of assessing the learning outcome	Type of teaching activities (if more than one) during which the outcome is assessed
E1	written test	L
E2	written test	L
E3	written test	L
E4	implementation of projects and laboratory tasks	Sw
E5	project implementation	Sw
E6	project and laboratory tasks implementation	Sw
E7	project and laboratory tasks implementation	Sw

Student's workload (in hours)	**1** - Attendance at lectures	13x2	26
	2 - participation in other forms of activities	15x2	30
	3 - Participation in student-teacher sessions	None	4
	4 - Preparing to pass a lecture/exam	None	10
	5 - preparation for current classes	None	10
	6 - implementation of the project	None	15
	7 - preparation of results and report	None	30
		TOTAL:	**125**
Quantitative indicators	Student's workload - activities that require direct teacher participation: (1)+(2)+(3)	60	**ECTS** 2.4
	Student's workload connected with practical classes (2)+(3)+(4)+(5)+(6)+(7)	99	4.0

Basic references:	1.https://docs.oracle.com/javaee/7/index.html 2. https://spring.io/ 3. Standards: XML, Xpath, XSLT, XML Schema, HTML, XHTML, CSS itd. dostępne pod adresem www.w3c.org 4. Java EE technologies: www.oracle.com/technetwork/java/javaee/tech/index.html
Further reading	1. W3C Specifications

Unit:	Department of Information Systems and Computer Networks	Lecturer/ instructor	dr inż. Urszula Kużelewska
Date of issuing the programme:	30th March 2026	Author of the programme:	dr inż. Urszula Kużelewska

L - lecture, C - classes, LC - laboratory classes, P-project, SW - specialization workshop, S - seminar