



## Subject card

Subject name and code	Large-scale enterprise applications, PG_00045322						
Field of study	Data Engineering						
Date of commencement of studies	October 2023	Academic year of realisation of subject			2025/2026		
Education level	first-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	3	Language of instruction			English		
Semester of study	6	ECTS credits			5.0		
Learning profile	general academic profile	Assessment form			exam		
Conducting unit	Department of Radiocommunication Systems and Networks -> Faculty of Electronics, Telecommunications and Informatics						
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Krzysztof Cwalina					
	Teachers	dr inż. Krzysztof Cwalina					
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	30.0	0.0	0.0	60
	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	60		8.0		57.0	125
Subject objectives	Overview of design patterns, architectures, and tools used for design and development of large-scale enterprise applications with focus on the Java Enterprise Edition platform						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K6_U02] designs, analyses correctness and creates functional specification of IT systems, selects appropriate measures, creates quality models, prepares and assesses their design documentation.	Student designs large-scale enterprise applications by choosing appropriate components of the Java EE platform according to the application requirements	[SU4] Assessment of ability to use methods and tools [SU1] Assessment of task fulfilment
	[K6_W05] Knows and understands programming models and evolution of related languages. Knows the methods of analysing and designing information systems and the modeling languages used in them, as well as the basic object-oriented programming platforms.	Student has knowledge of Java SE and Java EE platforms. Student is familiar with EJB component-programming model	[SW1] Assessment of factual knowledge
	[K6_W04] Knows the architecture of computers, operating system processes, file systems, text processing programs, disk and ram memories management rules. Knows the problems of sharing the state, presentation and transformation of information in a distributed system, hypermedia technologies and related services, the architecture of interactive distributed simulation and agent interaction methods.	Student has basic knowledge of architectures of distributed applications based on Java EE platform. Student is familiar with problems related to sharing of state between application component. Student has knowledge of hypermedia technologies and their applications in Java EE platform	[SW1] Assessment of factual knowledge
[K6_U01] programs in procedural, object, functional and logic programming languages, codes programs at the processor instruction level, runs and tests programs.	Student develops web applications in the Java programming language, is able to execute them on application server and performs integration and functional tests	[SU4] Assessment of ability to use methods and tools [SU1] Assessment of task fulfilment	
Subject contents	1. Overview of the Java SE platform, Java application structure and execution model. 2. Java application build process and related tooling. 3. Java collections and generic types. 4. Java Beans standard. 5. Enum types. 6. Thread handling in Java applications. 7. Sockets handling – TCP and UDP network programming. 8. Introduction to the Java EE platform. 9. Servlets, JSP and JSTL standards. 10. Component-programming of GUIs with JSF framework. 11. Processing of XML and JSON data formats. 12. Database access with JPA. 13. EJB container, stateful and stateless components. 14. Transactions in EJB layer, distributed transactions. 15. Authentication and authorization with JAAS framework. 16. Web services based on JAX-WS and JAX-RS specifications. 17. Microservices in Java EE platform.		
Prerequisites and co-requisites	Completion of the course: object-oriented programming		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	laboratory exercises	50.0%	50.0%
	exam	50.0%	50.0%
Recommended reading	Basic literature	1. E. Jendrock, I. Evans, D. Gollapudi, K. Haase, C. Srivathsa: „The Java EE 7 Tutorial”, Oracle, 2014.  2. Java EE 7 API Specification: <a href="https://docs.oracle.com/javaee/7/api/toc.htm">https://docs.oracle.com/javaee/7/api/toc.htm</a> .	
	Supplementary literature	1. A. L. Rubinger, B. Burke: „Enterprise JavaBeans 3.1”, O'Reilly Media, 2010.	
	eResources addresses	Adresy na platformie eNauczanie:	
Example issues/ example questions/ tasks being completed	1. Database handling in large-scale enterprise application.  2. Implementation of business layer components.  3. Design and implementation of remote APIs for service-oriented enterprise applications.  4. Authentication and authorization in enterprise application.		
Work placement	Not applicable		

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