



Subject card

Subject name and code	Large-scale enterprise applications, PG_00045322						
Field of study	Data Engineering, Data Engineering						
Date of commencement of studies	October 2026	Academic year of realisation of subject			2028/2029		
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 Teleinformation Networks -> Faculty of Electronics Telecommunications and Informatics -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Marcin Narloch				
	Teachers		dr inż. Marcin Narloch				
Lesson types	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_W01] identifies conditioning of the processes occurring in the analyzed systems and selects methods for solving them, using the accumulated knowledge and taking into account the mutual relations between the analyzed phenomena		Student designs large-scale enterprise applications by choosing appropriate components of the Java EE platform according to the application requirements. Student has knowledge of Java SE and Java EE platforms. Student is familiar with EJB component-programming model.		[SW1] Assessment of factual knowledge		
	[K6_W05] integrates data from multiple sources in order to analyze complex business problems		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_U05] develops innovative solutions for data analysis and processing, using appropriate methods and tools		Student develops applications in the Java programming language, is able to execute them on application server and performs integration and functional tests		[SU1] Assessment of task fulfilment [SU4] Assessment of ability to use methods and tools		

Subject contents	<p>Course content – lecture</p> <p>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.</p> <p>Course content – laboratory</p> <p>1. Tools for development LSEA. 2. Principles of developing small-scale and large-scale applications in Java. 3. Multithreading in LSEA. 4. Network connections and network programming in LSEA. 5. Database access with JPA and Object-Relational Mapping (ORM) in LSEA. 6. The role of software test in developing LSEA. 7. Servlets, JSP and JSTL standards in LSEA. 8. Java ServerFaces and Bean Validation in LSEA</p>		
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
	exam	50.0%	50.0%
	laboratory exercises	50.0%	50.0%
Recommended reading	Basic literature	<p>1. E. Jendrock, I. Evans, D. Gollapudi, K. Haase, C. Srivathsa: The Java EE 7 Tutorial, Oracle, 2014.</p> <p>2. Java EE 7 API Specification: https://docs.oracle.com/javasee/7/api/toc.htm.</p>	
	Supplementary literature	1. A. L. Rubinger, B. Burke: Enterprise JavaBeans 3.1, O'Reilly Media, 2010.	
	eResources addresses		
Example issues/ example questions/ tasks being completed	<p>1. Database handling in large-scale enterprise application.</p> <p>2. Implementation of business layer components.</p> <p>3. Design and implementation of remote APIs for service-oriented enterprise applications.</p> <p>4. Authentication and authorization in enterprise application.</p>		
Practical activities within the subject	Not applicable		

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