

Advanced e-Business technologies - course description

General information	
Course name	Advanced e-Business technologies
Course ID	04.2-WE-BizEIP-ZaawTechnE-Bizn-Er
Faculty	Faculty of Computer Science, Electrical Engineering and Automatics
Field of study	E-business
Education profile	practical
Level of studies	First-cycle Erasmus programme
Beginning semester	winter term 2021/2022

Course information	
Semester	3
ECTS credits to win	5
Course type	obligatory
Teaching language	english
Author of syllabus	<ul style="list-style-type: none">• dr inż. Jacek Tkacz• dr inż. Tomasz Gratkowski

Classes forms					
The class form	Hours per semester (full-time)	Hours per week (full-time)	Hours per semester (part-time)	Hours per week (part-time)	Form of assignment
Lecture	30	2	-	-	Exam
Laboratory	30	2	-	-	Credit with grade

Aim of the course

The basic concepts of the design, integration and programming of modern multilayer (n-tier) e-business systems based on JEE technologies. Designing systems based on the SOA paradigm using network services and their orchestration mechanisms. Acquaintance with modern tools supporting the design and implementation of the discussed solutions.

Prerequisites

Object-oriented design and programming

Scope

Multithreaded programming in Java. Creating and synchronizing threads. In-process synchronization mechanism, thread expropriation, time segmentation, priorities.

Basics of creating web applications in Java. Network socket programming, client-server architecture, server implementation, identification of network resources.

Architecture of modern client-server, B2C and B2B information systems. Comparison of techniques for producing e-business systems and technologies available in this field, i.e. PHP, .NET and JEE.

Basics of designing client-server type n-tiered (multi-layer) systems. Division into layers of presentation, business logic and data. Web application development based on Java Enterprise Edition (JEE) specification. Object-relational mapping (ORM) techniques, event queuing (JMS) techniques, transactional support.

Techniques of integration of modern information systems. The SOA (Service Oriented Architectures) paradigm and its application for building systems based on network services. WSDL language for description of network services. Systems integration using network services. Creating network services using Java.

Advanced integration using web services orchestration. Automatic composition of network services using semantic networks and semantic web services. The use of network services to create scalable SaaS (software as a service) systems for cloud computing.

Design patterns used during integration and design of IT systems. MVC pattern, inverted control (IoC) pattern, factory pattern.

A development tools for supporting the creation and testing of e-business applications.

Teaching methods

Lecture - standard lecture using a video projector.

Laboratory - practical classes in the computer laboratory.

Learning outcomes and methods of their verification

Outcome description	Outcome symbols	Methods of verification	The class form
Student can describe the architecture of modern multilayer client-server, B2B, B2C systems.		<ul style="list-style-type: none">• a pass - oral, descriptive, test and other	<ul style="list-style-type: none">• Lecture
The student knows the JEE specification techniques / technologies		<ul style="list-style-type: none">• a pass - oral, descriptive, test and other	<ul style="list-style-type: none">• Lecture

Outcome description	Outcome symbols	Methods of verification	The class form
The student is able to design and implement a simple application consisting of several network services		<ul style="list-style-type: none"> a preparation of a project 	<ul style="list-style-type: none"> Laboratory
The student knows SOA architectures to facilitate system integration.		<ul style="list-style-type: none"> a pass - oral, descriptive, test and other 	<ul style="list-style-type: none"> Lecture
The student can describe how to orchestrate network services and examples of use		<ul style="list-style-type: none"> a pass - oral, descriptive, test and other a preparation of a project 	<ul style="list-style-type: none"> Lecture Laboratory

Assignment conditions

Lecture - writing and/or oral test, carried out at the end of the semester

Laboratory - the final grade is the weighted sum of the marks obtained for the implementation of individual laboratory exercises and control tests verifying the substantive preparation for the exercises.

Final grade = 50% of the grade in the form of classes lecture + 50% of the grade in the form of laboratory classes.

Recommended reading

1. Erl, Th., Rischbeck, Th., SOA Design Patterns, Prentice Hall PTR; 1 edition (January 9, 2009)
2. Horstmann, C.S., Cornell, G., Core Java, Volume II--Advanced Features (11th Edition) 11th Edition, Prentice Hall; 11 edition (May 5, 2019)
3. Berners-Lee, T., [Weaving the Web](#), New York, HarperCollins, 2000.

Further reading

1. Goetz B., Peierls T., Bloch J., Bowbeer j., Holmes D., Lea D.: Java Concurrency in Practice, Addison-Wesley Professional 2006
2. Rotem-Gal-Oz A., SOA Patterns, Manning Publications; 1 edition (September 24, 2012)
3. Sharma S., Mastering Microservices with Java: Build enterprise microservices with Spring Boot 2.0, Spring Cloud, and Angular, 3rd Edition Paperback – February 26, 2019
4. Sparkowsky A, Piefel M, CorneliBen P., Spring Boot 2 Fundamentals, Packt Publishing, 2018

Notes

Modified by dr hab. inż. Marek Kowal, prof. UZ (last modification: 12-07-2021 11:41)

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