Study programme(s): Informatics (IM)

Level: master

Course title: Distributed systems (code IB223)

Lecturer: Danijela N. Boberić Krstićev

Status: obligatory for the Information technologies module; elective for other modules.

ECTS: 7,5

Requirements: none

Learning objectives

To provide practical overview of distributed systems and architectures that they are based on, with emphasis on the service oriented architecture. Within those topics, web service technology is studied in detail, including the concepts related to security and transactional data management in distributed environment. The use of the stated concepts is illustrated and practiced by using the Java EE platform.

Learning outcomes

Minimal: Students are expected to show clear understanding of theoretical concepts of distributed systems and service oriented architecture. Besides, they should be able to apply the basic technologies related to web services.

Optimal: Students are expected to show the ability to discuss advantages and disadvantages of different architectures for realization of distributed systems with deep understanding of the SOA concept. Understanding the influence of this topic to modern trends in development of information systems. Additionally, detailed knowledge of all studied technologies and specifications related to web services, as well as knowledge of their use in development of complex applications is expected.

Syllabus

Theoretical instruction

Theoretical background of distributed systems. Service oriented architecture – the concept and variations. Web services: SOAP protocol, WSDL and UDDI, interoperability – WS-I and Basic Profile, Java EE and web services – JAX-WS technology. Web services security – OASIS WS Security and its practical use from Java. Transactional data management – OASIS WS Transaction and its practical use from Java.

Practical instruction

Analysis of case studies of different architectures. Development of web services using Eclipse development environment and JBoss application server. The use of advanced web service concepts. Individual work on a comprehensive case study.

Literature

1. George Coulouris, Jean Dollimore, Tim Kindberg, Gordon Blair, “Distributed Systems: Concepts and Design”, 5th edition, Addison Wesley, 2011.

2. Andrew S. Tannenbaum, Marteen Van Steen, “Distributed Systems: Principles and Paradigms”, 2nd edition, Prentice Hall, 2006.

3. Thomas Erl, “SOA Principles of Service Design”, Prentice Hall, 2008.

4. Debu Panda, Reza Rahman, Ryan Cuprak, "EJB 3 in Action", 2nd edition Manning, 2012.

5. David Jamae, Peter Johnson, "JBoss in Action", Manning, 2009.

Weekly teaching load				Other: 0
Lectures: 2	Exercises: 3	Other forms of teaching: 0	Student research: 0	

Teaching methodology

Classical teaching methods are used in theoretical classes including the use of a video-beam. The same is applied in analyzing case studies and practically mastering the skills of using the suggested tools. Students expand their knowledge by investigating the topics introduced and test it in two colloquia that are related to the work on an individual case study.

Grading (maximum number of points 100)

Pre-exam obligations	**points**	**Final exam**	**points**
Two colloquia	**25, 25**	Oral exam	50