

Advanced Information Technologies Course

<i>Name of the subject:</i> Advanced Information Technologies - BSc	<i>SUBJECT code:</i>	Weekly hours: 4	Credit: 6
<i>Subject leader:</i> Darko Brodić, Predrag Đorđević (Branislav Ivanov)	<i>Academic Degree:</i> Associate Professor, Assistant Professor (Teaching Assistant)	Prerequisites: Knowledge acquired within the courses Informatics 1 and Informatics 2	

Purpose:

The objective of the course is to enable students to acquire specialized and applied knowledge in the field of advanced information technologies and to train students for the application of these technologies in engineering practice.

Course description:

During this course the students will be familiarized with the following topics regarding the advanced hardware systems and architectures: Components of modern information systems; Specialized hardware architectures (SPM, NUMA, clusters, grid architecture); Open architecture systems; Application servers; Three-layer client-server architecture.

The students will also have an opportunity to acquire knowledge of the concepts of information exchange in modern business practice, as well as the Data Warehousing and Data Mining concepts. The following topics will be covered in the lectures: Information exchange in business practice in the internet era and the role and application of metadata standards; Fundamentals of HTML - elements and structure of a HTML document; XML conceptual model; Structure, elements and attributes of XML document; Validation of XML document (DTD, XML Schema), XML technologies, Practical applications of XML, Business intelligence; Data Warehousing, ETL, OLAP, OLTP; Data mining concepts; Data mining techniques and algorithms.

Schedule

Weeks	Topics
1.	Local area networks
2.	Cloud computing
3.	Client-server architecture
4.	N-tier client-server architecture
5.	UMA, NUMA, DMA
6.	Data mining
7.	Colloquium
8.	Information exchange and metadata standards in business practice
9.	Fundamentals of HTML and XML conceptual model
10.	XML validation
11.	XML technologies
12.	Business intelligence, Data Warehousing
13.	Data Mining concepts
14.	Data mining techniques and algorithms

Final grade:

Grading Policy:

Activity	Points
Class Participation	10 Lectures + 10 Practical work
Midterm Exam	20 (10 Hardware part + 10 Software part)
Seminar project	10
Final Exam	50 (25 Written Exam + 25 Oral Exam)
Grading Scale:	
Points	Grade
0 - 50	5 (Failed)
51 - 60	6 (Satisfactory)
61 - 70	7 (Good)
71 - 80	8 (Very Good)
81 - 90	9 (Excellent)
91 - 100	10 (Excellent - Outstanding)
Compulsory literature:	
<ol style="list-style-type: none"> 1. Skonnard, Aaron, and Martin Gudgin. "Essential XML quick reference." Addison-Wesley, (2002). 2. Dean, Jared. Big data, data mining, and machine learning: value creation for business leaders and practitioners. John Wiley & Sons, (2014). 	
Supplemental literature:	
<ol style="list-style-type: none"> 1. Jiawei, H., and M. Kamber. "Data mining: Concepts and techniques, (the Morgan Kaufmann series in data management systems), (2011). 	