

Specification for the book of courses

Study program		Computing and Informatics		
Module		Data Science		
Type and level of studies		Master studies		
The name of the course		Big Data Systems		
Lecturer (for lectures)		Stojanović H. Dragan, Stojanović M. Natalija		
Lecturer/associate (for exercises)		Stojanović M. Natalija		
Lecturer/associate (for OFE)				
Number of ECTS		4	Course status (obligatory/elective)	Elective
Prerequisites				
Course objectives		Acquiring knowledge, methods and technologies for design and implementation of systems for large-scale data processing and analysis (Big Data).		
Course outcomes		Theoretical and practical knowledge about principles, methods, software tools, libraries and platforms for design, implementation and evaluation of software systems for large-scale data processing and analysis (Big Data), both offline as well as fast and large data streams originated from Internet of Things		
Course outline				
Theoretical teaching		Introduction to Big Data. Fundamental principles, methods and technologies for storage, processing, and analysis of large-scale data (Big Data), as well as machine learning and mining over Big Data. Distributed file systems and distributed databases for Big Data storage. Software frameworks and platforms for management, processing and analysis of Big Data. Data stream and complex event management and processing systems. Big Data visualization and visual analysis. Big Data management and analysis in Internet of Things and ubiquitous computing. Cloud computing and Big Data processing in cloud, fog and edge. Open source technologies and software platforms for distributed processing and analysis of Big Data. Analysis, design, implementation and evaluation of systems and applications for Big Data processing and analysis. Contemporary applications based on Big Data systems for in smart cities, intelligent transportation, Internet of Things, social networks/media, geo-spatial systems, etc.		
Practical teaching (exercises, OFE, study and research)		Practical work on design and implementation of systems and applications for big data storage, processing and analysis, as well as fast data streams, and evaluation of such systems and applications on real big dataset in contemporary application domains over the set of lab exercises and development of a software project.		
Textbooks/references				
1	Nathan Marz, James Warren: Big Data Principles and best practices of scalable realtime data systems. Manning Publications Co., 2015.			
2	Petar Zečević, Marko Bonaći, Spark in Action, Manning publications, 2017			
3	Kai Hwang, Min Chen, Big-Data Analytics for Cloud, IoT and Cognitive Computing, Wiley, 2017.			
4	Dean Wampler, Fast Data Architectures for Streaming Applications, 2nd edition, O'Reilly Media, 2019.			
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Number of classes of active education per week during semester/trimester/year				
Lectures	Exercises	OFE	Study and research work	Other classes
2	1	0		
Teaching methods	Lectures, auditive exercises, lab practicing, independent student work on assignments and projects, student seminars.			
Grade (maximum number of points 100)				
Pre-exam duties		Points	Final exam	Points
Activity during lectures			Written exam	40
Exercises			Oral exam	
Colloquia		40		
Projects		20		