

Specification for the book of courses

Study program		Computing and Informatics		
Module		Computer Systems Security		
Type and level of studies		Master studies		
The name of the course		Fault Tolerant Systems		
Lecturer (for lectures)		Milovanović I. Emina, Milentijević Z. Ivan		
Lecturer/associate (for exercises)		Milovanović I. Emina		
Lecturer/associate (for OFE)				
Number of ECTS	4	Course status (obligatory/elective)	Elective	
Prerequisites				
Course	The main objective is to present methods and techniques for fault tolerant system design.			
Course outcomes	Students are expected to understand and be able to develop and implement various fault tolerant techniques.			
Course outline				
Theoretical teaching	Need analysis for fault tolerant systems. Reliability, availability, security, performance, sustainability, testability. Basic definitions. Failure models. Error models. Redundancy techniques for fault tolerance. Hardware redundancy (passive, active, hybrid). Information redundancy (parity, m of n, duplication, checksums, etc.). Time redundancy. Software redundancy (consistency checks, functionality, N-version programming). Fault tolerance in cloud computing			
Practical teaching (exercises, OFE, study and research)	Exercises through students' projects.			
Textbooks/references				
1	I. Koren and C. Krishna, "Fault-Tolerant Systems", Morgan Kaufmann, San Francisco, US, 2007.			
2	E. Dubrova, Fault-Tolerant Design, Springer-Verlag New York, 2013.			
3	Dhiraj K. Pradhan, Fault-tolerant computer system design, Prentice Hall PTR, New Jersey, 1995			
4	scientific articles			
5				
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, exercises, individual research			
Grade (maximum number of points 100)				
Pre-exam duties	Points	Final exam	Points	
Activity during lectures	10	Written exam		
Exercises	10	Oral exam	40	
Colloquia				
Projects	40			