

Study programme(s): Information Technologies				
Level: Bachelor				
Course title: Formal Methods in Engineering				
Lecturer: Gordana Rakić				
Status: elective				
ECTS: 7				
Requirements: none				
Learning objectives The course will enable to students a deep understanding and critical evaluation of formal methods and to give fundamental details of certain techniques based on automata theory and software tools based on industry-strength tools like “Statemate”, “IAR Visual State” or “Yakindu”.				
Learning outcomes <i>Minimal:</i> At the end of the course it is expected that successful student will be able to critically evaluate the need to establish reliability in large-scale computer systems and to appreciate fundamentals of formal methods. It is also expected that the student will accept basic conclusions on using formal techniques in the life-time cycle of the system, especially in requirements and architecture design phases. <i>Desirable:</i> At the end of the course it is expected that successful student shows capability to critically evaluate different kinds of large-scale systems and different kinds (transforming to hybrid) of systems. Also he/she will appreciate the role of tools and methods for the formal methods engineering.				
Syllabus <i>Theoretical instruction</i> Theoretical foundations of large-scale systems, classification of formal methods, transforming, reactive and hybrid systems, automata theory, state-oriented development methods, state diagrams, activity diagrams, real-time aspects. <i>Practical instruction</i> Introduction to semantics and tools. Development of real-time system/ Analysis and development of several case studies.				
Literature <i>Recommended</i> 1. Nissim Francez, 'Program Verification', Addison-Wesley, 1992 2 S. Hassoun and T Sasao, 'Logic Synthesis and Verification', 2002				
Weekly teaching load				
Lectures: 2	Exercises: 1	Practical Exercises: 2	Student research:	Other:
Teaching methodology During lecture classes, the classical methods are used. Exercises are mostly consisting of case study analyses. Assignments are mostly practical, whose aim is to practically apply principles covered during lectures and exercises, using appropriate tools.				
Grading method (maximal number of points 100)				
Pre-exam obligations	points	Final exam	points	
Partial assignments	30	Theoretical exam	40	
Final project	30			