

Study program:	Electrical and computer engineering – Module: Computer engineering			
Type and level of studies:	Undergraduate academic studies (first level of studies)			
Course unit:	Parallel Computer Systems			
Teacher in charge:	Uroš Pešović, teaching assistant Dejan Vujičić			
Language of instruction:	English			
ECTS:	5			
Prerequisites:	-			
Semester:	Winter			
Course unit objective				
Understanding of limitations with parallel computing, instruction level parallelism and loop level parallelism. Understanding of possibilities of detection and implementation of hardware parallelism during program execution.				
Learning outcomes of Course unit				
Deep understanding of superscalar processors and VLIW processors, compiler optimizations and parallelism models.				
Course unit contents				
<i>Theoretical classes</i>				
<ul style="list-style-type: none"> - Instruction level parallelism. - Data dependencies and graphs. - Trace scheduling. - Speculative execution. - Loop parallelism. - Graphs of loop data dependencies. - Software pipeline. - Vector supercomputers, very large instruction word machines, and superscalar processors. - Multicore processors. - Hyperthreading. 				
<i>Practical classes</i>				
Usage of simulators.				
Literature:				
1.	Zoran Jovanović, Instruction Level Parallelism, ATC Avangarda, Belgrade, 2006			
2.	Roman Trobec, Marian Vajteršic, Peter Zinterhof, Parallel Computing – Numerics, Applications and Trends, Springer – Verlag, 2009			
Number of active teaching hours				
Lectures: 2	Practice: 2	Other forms of classes: 0	Other classes	Independent work: Case study:
Teaching methods:				
Lectures, tutorials, projects, demonstrations				
Examination methods (maximum 100 points)				
Exam prerequisites	No. of points:	Final exam		No. of points:
Student's activity during lectures		oral examination		30
Practical classes		written examination		40
Colloquiums				
Seminars/homework	30			
Grading system				
Grade	No. of points:		Description	
10	91-100		Excellent	
9	81-90		Exceptionally good	
8	71-80		Very good	
7	61-70		Good	
6	51-60		Passing	
5	less than 50		Failing	