

## Specification for the book of courses

<b>Study program</b>		Electrical Engineering and Computer Science		
<b>Module</b>		Common		
<b>Type and level of studies</b>		Doctoral studies		
<b>The name of the course</b>		Highly Efficient Iterative Methods		
<b>Lecturer (for lectures)</b>		Rančić Z. Lidija		
<b>Lecturer/associate (for exercises)</b>				
<b>Lecturer/associate (for OFE)</b>				
<b>Number of ECTS</b>	10	<b>Course status (obligatory/elective)</b>	Elective	
<b>Prerequisites</b>				
<b>Course objectives</b>		Students are trained to contribute to the development of new iterative methods and their application.		
<b>Course outcomes</b>		Students are familiar with the construction elements and the analysis of the convergence of iterative methods for solving some classes of nonlinear equations and the linear equations system. They are trained to apply acquired knowledge through self-study and possibly writing scientific paper in this topic.		
<b>Course outline</b>				
<b>Theoretical teaching</b>		Basic characteristics of iterative methods. Convergence analysis, order of convergence, R-order of convergence. Initial values problem and stability of methods. High precision iterative methods for determining the zeroes of the analytic function and the zeroes of polynomial. Iterative methods for determining the solution of the linear equations system (the Krilov space, Arnoldi iteration, GMRS method). Application of mathematical software tools in realization of the mentioned methods.		
<b>Practical teaching (exercises, OFE, study and research)</b>				
<b>Textbooks/references</b>				
1	Miodrag Petković, Lidija Rančić, Dušan Milošević, Numerical solving of nonlinear equations, Faculty of Electronic Engineering, University of Niš, 2009. (Serbian)			
2	Miodrag Petković, Iterative Methods for Simultaneous Inclusion of Polynomial Zeros, Springer-Verlag-Berlin-Heidelberg-New York, 1989, Reprinted 2008.			
3	Yousef Saad, Iterative Methods for Sparse Linear Systems, SIAM, Philadelphia, 2003			
4				
5				
<b>Number of classes of active education per week during semester/trimester/year</b>				
<b>Lectures</b>	<b>Exercises</b>	<b>OFE</b>	<b>Study and research work</b>	<b>Other classes</b>
3	0	0	0	0
<b>Teaching methods</b>		Lectures, tutorials		
<b>Grade (maximum number of points 100)</b>				
<b>Pre-exam duties</b>		<b>Points</b>	<b>Final exam</b>	<b>Points</b>
<b>Activity during lectures</b>			<b>Written exam</b>	
<b>Exercises</b>			<b>Oral exam</b>	50
<b>Colloquia</b>				
<b>Projects</b>		50		