

## Specification for the book of courses

<b>Study program</b>		Computing and Informatics		
<b>Module</b>		Data Science		
<b>Type and level of studies</b>		Master studies		
<b>The name of the course</b>		Pattern Recognition		
<b>Lecturer (for lectures)</b>		Vučković V. Vladan, Radmanović M. Miloš		
<b>Lecturer/associate (for exercises)</b>		Radmanović M. Miloš		
<b>Lecturer/associate (for OFE)</b>				
<b>Number of ECTS</b>	4	<b>Course status (obligatory/elective)</b>	Elective	
<b>Prerequisites</b>				
<b>Course objectives</b>	The objective of the course is to familiarize students with basic methods and techniques for identifying samples and acquiring knowledgeable skills for independent research work in this field and practical implementation of sample recognition applications.			
<b>Course outcomes</b>	Students will gain knowledge on the methods and techniques from this course areas for identifying patterns that will enable them to solve problems and independent research work in the field of pattern recognition.			
<b>Course outline</b>				
<b>Theoretical teaching</b>	Systems for identifying samples, registering and measuring object characteristics. Data acquisition, preprocessing and signal representation. Reducing complexity and classification. Statistic methods for pattern recognition. Classification based on minimal error. Classification based on maximum similarity. EM-algorithm. SVM (Support Vector Machine) classifiers. Stochastic finite automata and discrete Markov models. Hidden Markov models. Real-time visual recognition systems. Systems for processing and recognizing digital images and scanned documents. OCR systems. Examples of applying pattern recognition.			
<b>Practical teaching (exercises, OFE, study and research)</b>	Study research work: Preparation of seminar papers in the field of pattern recognition and oral presentation and defense of works.			
<b>Textbooks/references</b>				
1	S. Pal, A. Pal, Pattern Recognition From Classical to Modern Approaches, World Scientific, 2001.			
2	S. Bow, Pattern Recognition and Image Preprocessing, CRC Press, 2002.			
3	R. Duda, P. Hart, D. Stork, Pattern Classification, Wiley, 2000.			
4	Teaching materials on the site: <a href="http://cs.elfak.ni.ac.rs/nastava/">http://cs.elfak.ni.ac.rs/nastava/</a>			
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<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>
2	1	0		
<b>Teaching methods</b>	Lectures and demonstration exercises using slides and demo examples. Independent research work of students, creation, presentation and defense of seminar papers. Realization of projects.			
<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>	20	<b>Oral exam</b>	50	
<b>Colloquia</b>				
<b>Projects</b>	30			