Specification for the book of courses

Study program		Electrical Engineering and Computer Science		
Module		Common		
Type and level of studies		Doctoral studies		
The name of the course		Detection of Signals in Noise		
Lecturer (for lectures)		Perić H. Zoran, Milić N. Dejan		
Lecturer/associate (for exercises)				
Lecturer/associate (for OFE)				
Number of ECTS	10	**Course status (obligatory/elective)**	Elective	
Prerequisites				
Course objectives	Acquiring knowledge in the fields of application of linear systems and decision making theories for signal detection from interference.			
Course outcomes	Detection of a known and an unknown signal in white and colored Gaussian noise. Maximization of signal-to-noise ratio and custom filters. Optimum filter for colored noise.			
Course outline				
Theoretical teaching	Linear systems. The noise factor. Optimal linear systems. Nonlinear Systems - direct method. Nonlinear systems - transformation method. Statistical signal detection. Optimal signal reception in the noise. Detection of a known and an unknown signal in white and colored Gaussian noise. Maximization of signal-to-noise ratio and custom filters.Optimum filter for colored noise. The A Posteriori Theory of Reception. Statistical theory of detection. Detection based on a single sample. Detection based on multiple samples. Estimation of signal parameters.			
Practical teaching (exercises, OFE, study and research	Lectures. Consultations. Study and research work.			
Textbooks/references				
1	D. Drajić, Uvod u statističku teoriju telekomunikacija, Akademska misao, Beograd, 2003.			
2	J. Proakis, M. Salehi, Digital Communications, McGraw-Hill Education, 5th edition, 2007.			
3	U.Spagnolini, Statistical Signal Processing in Engineering, Wiley, 2018.			
4	A. R. Webb, K. D. Copsey, Statistical Pattern Recognition, Wiley, 3rd Edition, 2011.			
5	V. N. Vapnik, Statistical Learning Theory (detection and estimation), Wiley-Interscience, 1998.			

Number of classes of active education per week during semester/trimester/year				
Lectures	**Exercises**	**OFE**	**Study and research work**	**Other classes**
3	0	0	0	0
Teaching methods	Lectures, Project work, Consultations.			

Grade (maximum number of points 100)			
Pre-exam duties	**Points**	**Final exam**	**Points**
Activity during lectures		**Written exam**	
Exercises		**Oral exam**	50
Colloquia			
Projects	50		