Specification for the book of courses

Study program	Electrical Engineering and Computer Science		
Module	Communications and Information Technologies - Communications and Information Processing		
Type and level of studies	Undergraduate Academic Studies		
The name of the course	Telecommunications Theory		
Lecturer (for lectures)	Đorđević T. Goran		
Lecturer/associate (for exercises)	Cvetković M. Aleksandra		
Lecturer/associate (for OFE)	Cvetković M. Aleksandra		
Number of ECTS	6	**Course status (obligatory/elective)**	Obligatory
Prerequisites			
Course objectives	Introduction to basic knowledge in the Telecommunications Theory and their application to the determination of the telecommunication systems performance.		
Course outcomes	After passing the exam, students will: 1) know to generate random variables with a given arbitrary distribution; 2) know to determine the autocorrelation function and power spectrum density of random signals; 3) know to apply an analytical and simulation approach in estimating the error probability of digital signals detection; 4) understand the principles of optimal, matched and adaptive filtering.		
Course outline			
Theoretical teaching	The telecommunication system model from the point of view of Theory of Telecommunications. Random variables. Basic types of probability distribution in telecommunication systems. Transformation of probability density function. Generating random variables with a given distribution. Principle of Monte Carlo simulation. Reliability interval in Monte Carlo simulations. Autocorrelation function and power spectral density of random signal. Broadband and narrowband Gaussian noise. Analytical and simulation determination of the error probability in the digital signals detection in the based band and transponder frequency range. Intersymbol interference. Determination of the error probability in the channel with intersymbol interference. Viterb's algorithm and its application for the suppression of intersymbol interference. Concepts of optimal, matched and adaptive filtering. Introduction to probabilistic decision theory.		
Practical teaching (exercises, OFE, study and research	Auditory and laboratory exercises will be organized from all method units from the lectures.		
Textbooks/references			
1	G. T. Đorđević, Introduction to Telecommunications Theory (in Serbian), Faculty of Electronic Engineering in Niš, Niš, 2016.		
2	G. T. Đorđević, M.Č.Stefanović, A collection of solved problems in telecommunications theory (in Serbian), Faculty of Electronic Engineering in Niš, Niš, 2011.		
3	D. B. Drajić, Introduction to Statistical Telecommunications Theory (in Serbian), Академска мисао, Belgrade, 2006.		
4	G. Lukatela, Statistical Theory of Telecommunications and Information Theory (in Serbian), Građevinska knjiga, Belgrade, 1981.		
5	A. Papoulis, S. U. Pillai, Probability, random variables and stochastic processes, 4th edition, McGraw-Hill Europe, 2002.		

Number of classes of active education per week during semester/trimester/year				
Lectures	**Exercises**	**OFE**	**Study and research work**	**Other classes**
2	2	1	0	0
Teaching methods	Theory classes. Auditory exercises. Laboratory exercises. Consulatations.			

Grade (maximum number of points 100)			
Pre-exam duties	**Points**	**Final exam**	**Points**
Activity during lectures	5	**Written exam**	20
Exercises	5	**Oral exam**	30
Colloquia	20		
Projects	20		