

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		Telecommunications Theory		
Lecturer (for lectures)		Đorđević T. Goran, Milović M. Daniela		
Lecturer/associate (for exercises)				
Lecturer/associate (for OFE)				
Number of ECTS	10	Course status (obligatory/elective)	Elective	
Prerequisites				
Course objectives	The acquisition of knowledge from Theory of Telecommunications and their application for the analysis, design and optimization of modern wireless and optical systems. Training for independent research work in this field.			
Course outcomes	After passing the exam students will: 1) know that they apply acquired knowledge and skills from Theory of Telecommunications in the study of modern optical and wireless systems; 2) know how to determine the limits that can improve the performance of these systems; 3) know how to analyze and project receivers in channels with intersymbol interference using analytical and simulation methods.			
Course outline				
Theoretical teaching	Statistical characterization of channels in modern radio-frequency and optical wireless systems. Error probability and capacity evaluation using analytical and simulation approach. Controlled intersymbol interference. Optimal detection in different channel conditions. Combined equalization and coding. Spatial-time codes. Performance assessment of multi-cell wireless systems. Study the information transmission through Visible Light Communications - VLC from the point of view of Theory of Telecommunications.			
Practical teaching (exercises, OFE, study and research)				
Textbooks/references				
1	A. Papoulis, S. U. Pillai, Probability, random variables and stochastic processes, 4th edition, McGraw-Hill Europe, 2002.			
2	E. Biglieri, Coding for Wireless Channels, Springer, 2005.			
3	Z. Ghassemlooy, W. Popoola, S. Rajbhandari, Optical Wireless Communications: System and Channel Modelling with MATLAB, CRC Press, 2017.			
4	D. B. Drajić, Introduction to Statistical Telecommunications Theory (in Serbian), Akademski misao, Belgrade, 2006.			
5	T. Richardson and R. Urbanke, Modern Coding Theory, Cambridge Univ Press, 2008.			
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. Consultations.			
Grade (maximum number of points 100)				
Pre-exam duties	Points	Final exam		Points
Activity during lectures		Written exam		20
Exercises		Oral exam		30
Colloquia				
Projects	50			