

## Specification for the book of courses

<b>Study program</b>		Electrical Engineering and Computer Science		
<b>Module</b>		Communications and Information Technologies - Communications and Information Processing		
<b>Type and level of studies</b>		Undergraduate Academic Studies		
<b>The name of the course</b>		Wireless Communication Technologies		
<b>Lecturer (for lectures)</b>		Nikolić B. Zorica, Milović M. Daniela, Milić N. Dejan		
<b>Lecturer/associate (for exercises)</b>		Panajotović S. Aleksandra		
<b>Lecturer/associate (for OFE)</b>		Panajotović S. Aleksandra		
<b>Number of ECTS</b>	5	<b>Course status (obligatory/elective)</b>	Elective	
<b>Prerequisites</b>				
<b>Course</b>	Learning basic knowledge and skills in analysis and signal modulation procedures.			
<b>Course outcomes</b>	Theoretical knowledge. Mastering the use of appropriate software simulation. Working on a DSP platform.			
<b>Course outline</b>				
<b>Theoretical teaching</b>	Introduction. Multilevel modulation schemes. Time division multiplex. Frequency division multiplex. Pseudo-random carrier modulation. Pseudorandom sequences and their properties. Modulation with direct sequence (DS) and frequency hopping (FH). Principles of synchronization. Basic principles of OFDM technique. Synchronization and channel estimation in OFDM systems. Wireless communication systems and networks. Evolution of mobile networks. GSM, UMTS, LTE, 5G. WiFi, Bluetooth, ZigBee. IEEE802.x standards under development. Security problems and current standards.			
<b>Practical teaching (exercises, OFE, study and research)</b>	Computational exercises are carried out from all the thematic units. Laboratory exercises are derived from digital modulation, direct sequence sequencing and OFDM.			
<b>Textbooks/references</b>				
1	Z. Nikolic: Spread spectrum systems performance (in Serbian), Faculty of Electronic Engineering Niš, 2006, Edition: Monographs			
2	Z. Nikolic, N. Milosevic, B. Dimitrijevic: Multiplex signal transmission (in Serbian), Faculty of Electronic Engineering Niš, 2006, Edition: textbooks			
3	Z. Nikolic, N. Stojanovic, D. Pokrajac, V. Smiljanic, N. Milosevic: Laboratory exercises for Basics of telecommunications and Digital telecommunications (in Serbian), Faculty of Electronic Engineering Niš, 1999			
4	S. Glisic: Spread Spectrum Systems (in Serbian), Belgrade, 1981			
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>
2	2	1	0	0
<b>Teaching methods</b>	Oral teaching in the classroom. Auditory and laboratory exercises.			
<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>	10	<b>Written exam</b>		20
<b>Exercises</b>	10	<b>Oral exam</b>		20
<b>Colloquia</b>	40			
<b>Projects</b>				