

## Specification for the book of courses

<b>Study program</b>		Electrical Engineering and Computer Science		
<b>Module</b>		Electron Devices and Microsystems		
<b>Type and level of studies</b>		Undergraduate Academic Studies		
<b>The name of the course</b>		Components for Telecommunications		
<b>Lecturer (for lectures)</b>		Manić Đ. Ivica, Danković M. Danijel		
<b>Lecturer/associate (for exercises)</b>		Manić Đ. Ivica, Danković M. Danijel		
<b>Lecturer/associate (for OFE)</b>		Đorđević D. Miloš		
<b>Number of ECTS</b>		6	<b>Course status (obligatory/elective)</b>	Elective
<b>Prerequisites</b>				
<b>Course objectives</b>		To make introduction to most important passive and active devices for transmission, processing, amplification, receiving and emission of signals in telecommunications		
<b>Course outcomes</b>		Students gain understanding of standard and specific electronic devices and comprehension of their applications in telecommunications.		
<b>Course outline</b>				
<b>Theoretical teaching</b>		Peculiarities of devices for telecommunications. Transmission lines. Classification of transmission lines. Connectors and sockets. Passive electronic components. Ferrite and combined components. Semiconductor materials: Si and III-V compounds. Diodes. Bipolar transistor. MOS transistor. LD MOS transistor. FET. Integrated circuits. Digital circuit technologies. CMOS. BiCMOS. Dynamic RAM cells: capacitive cell, FLASH, FeRAM. Low noise receivers. Components in SMD technology.		
<b>Practical teaching (exercises, OFE, study and research work)</b>		Auditory exercises cover the areas of transmission lines, passive devices, bipolar and MOS transistors, CMOS circuits, memories and SMD devices. Laboratory exercises include realization of basic circuits with rectifying, Zener, Schottky diodes and LEDs, measurements of bipolar and MOS transistor and CMOS inverter characteristics, realization of basic amplifying and oscillatory circuits, frequency multipliers, filters, amplitude and frequency modulators and demodulators, basic arithmetic operation circuits, and photodiode and phototransistor based remote control units.		
<b>Textbooks/references</b>				
1		Printed matter – lecture texts and PowerPoint slides, problems with solutions and instructions for laboratory exercises		
2		T.S. Laverghetta, Microwaves and Wireless Simplified (2nd ed.), Artech House, Boston, 2005, ISBN 1-58053-943-2		
3		Allan W. Scott, Understanding Microwaves, Willey, 2005, ISBN 978-0-471-74533-4		
4		S. Dimitrijević, Understanding Semiconductor Devices, Oxford University Press, New York, 2000, ISBN 0-19-513186-X		
5		Danijel Danković, Laboratory Practicum with tasks for independent work in the field of Telecommunications Components (in Serbian), University of Niš - Faculty of Electronic Engineering, 2018, ISBN 978-86-6125-202-0		
<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>		Lectures, exercises, laboratory exercises, consultations		
<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>		30	<b>Oral exam</b>	20
<b>Colloquia</b>		20		
<b>Projects</b>				