Specification for the book of courses

Study program	Electrical Engineering and Computer Science		
Module	Communications and Information Technologies		
Type and level of studies	Undergraduate Academic Studies		
The name of the course	Digital Communications		
Lecturer (for lectures)	Perić H. Zoran, Jovanović Ž. Aleksandra, Nikolić R. Jelena		
Lecturer/associate (for exercises)	Jovanović Ž. Aleksandra, Panajotović S. Aleksandra		
Lecturer/associate (for OFE)	Jovanović Ž. Aleksandra, Panajotović S. Aleksandra		
Number of ECTS	6	**Course status (obligatory/elective)**	Obligatory
Prerequisites			
Course objectives	Provide fundamental knowledge about analog-to-digital conversion based on differential encoding. Provide necessary knowledge about line coding, digital modulation and digital signal detection.		
Course outcomes	The student will fully master the techniques for analogue-to-digital conversion, based on differential encoding. Also, the student will understand the advantages and disadvantages of line codes. He will acqure the necessary knowledge about digital modulation and digital signal detection.		
Course outline			
Theoretical teaching	Delta modulation. Adaptive delta modulation. Delta-sigma modulation. Differential pulse code modulation. Adaptive differential pulse code modulation. Scrambling in digital communication. Line coding. Digital modulation: ASK, FSK and PSK. Quadrature amplitude modulation QAM. Trellis coded modulation. Optimal filters. Wiener filtering. Equalization in digital communication. Adaptive equalization. Estimation of the error probability for digitally modulated signals.		
Practical teaching (exercises, OFE, study and research	At the practical and laboratory exercises, theoretical knowledge is improved through analitical and software solving of assignments. Students are enabled to recognize, through certain exercises, the importance of applying techniques based on differential encoding in the analog-to-digital conversion of highly correlated signals. At the exercises, students also learn to simulate the passband transmission of digital information.		
Textbooks/references			
1	J. Proakis, M. Salehi, Digital Communications, McGraw-Hill Education, 5th edition, 2007.		
2	M.Safak, Digital Communications, Wiley, 1st edition, 2017.		
3	Z. Peric, V. Despotovic, J. Nikolic, A. Jovanovic, N. Simic, Practicum for Digital Telecommunications I with the MATLAB Examples (in Serbian), Faculty of Electronic Engineering, Nis, 2017.		
4	N.S. Jayant, P. Noll, Digital Coding of Waveforms, Prentice-Hall, New Jersey, 1984.		
5	V. Ostojic, S. Suzic, A. Minja, Ž. Trpovski, Practicum for computer exercises from communication systems (in Serbian), FTN Novi Sad, 2019.		

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	Lectures, auditory exercises, practical lessons on computers, homework assignments, consultations.			

Grade (maximum number of points 100)			
Pre-exam duties	**Points**	**Final exam**	**Points**
Activity during lectures	5	**Written exam**	20
Exercises	15	**Oral exam**	20
Colloquia	40		
Projects			