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	Introduction to Digital Communications		
Lecturer (for lectures)	Perić H. Zoran		
Lecturer/associate (for exercises)	Nikolić R. Jelena, Jovanović Ž. Aleksandra		
Lecturer/associate (for OFE)	Nikolić R. Jelena, Jovanović Ž. Aleksandra		
Number of ECTS	6	**Course status (obligatory/elective)**	Obligatory
Prerequisites			
Course objectives	Provide basic knowledge about digital signal processing and digital signal transmission with emphasis on quantization techniques and methods of quantizer design. Pay special attention to the baseband transmission and its performances.		
Course outcomes	Knowledge necessary for designing different models of scalar quantizers. Practical experience in quantizer design and application in PCM and APCM systems. Knowledge about the baseband transmission and its performances.		
Course outline			
Theoretical teaching	Signal statistical characteristics. Signal distribution. Amplitude signal dynamics. Uniform quantizers. Logarithmic quantizers. Optimal companding quantizers. Performances of uniform and companding quantizers. Piecewise uniform quantizers. Piecewise linear companding quantizers. Adaptive quantizers. Pulse code modulation PCM and adaptive pulse code modulation APCM. Baseband digital transmission. The error probability for baseband binary data transmission. M-ary pulse amplitude modulation MPAM and its error probability.		
Practical teaching (exercises, OFE, study and research	Practical exercises are performed from all thematic units. At the practical exercises, the problem solving improves the theoretical knowledge and enables to notice the importance of an adequate choice of the quantizer model for the given statistical characteristics of the signal being processed. At the laboratory exercises, students design different quantization models that are applied in PCM and APCM systems. At these exercises, students also learn to simulate the baseband digital transmission.		
Textbooks/references			
1	Z. Peric, A. Jovanovic, J. Nikolic, Book of problems for Digital Telecommunications I - selected chapters (in Serbian), Faculty of Electronic Engineering, Nis, 2016.		
2	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.		
3	N.S. Jayant, P. Noll, Digital Coding of Waveforms, Prentice-Hall, New Jersey, 1984.		
4	J. Proakis, M. Salehi, Digital Communications, McGraw-Hill Education, 5th edition, 2007.		
5	M. Safak, Digital Communications, Wiley, 1st edition, 2017.		

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, practical exercises, practical training 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			