

Specification for the book of courses

Study program		Communications and Information Technologies		
Module		Communications and Information Processing		
Type and level of studies		Master studies		
The name of the course		Digital Information Processing		
Lecturer (for lectures)		Perić H. Zoran, Jovanović Ž. Aleksandra, Nikolić R. Jelena		
Lecturer/associate (for exercises)		Nikolić R. Jelena		
Lecturer/associate (for OFE)				
Number of ECTS		4	Course status (obligatory/elective)	Obligatory
Prerequisites				
Course objectives		Teach students the methods on which modern digital information processing is based. Introduce students with the possibilities that digital information processing offers in a wide range of applications, such as error control coding, signal classification and detection, speaker recognition. Define and successfully mentorize the selected project assignments in the field of digital information processing.		
Course outcomes		Acquired theoretical knowledge about digital information processing and gained practical experience in working with software tools for digital information processing.		
Course outline				
Theoretical teaching		Quantization and classification. Pattern classification. Statistical pattern recognition. Information processing in source coding. Information processing in signal and data compression. Wiener filter and stochastic filtering. Fundamentals of kalman filtering. Fundamentals of adaptive filtering. Information processing in channel coding. Information processing in signals and data classification and in signal detection. Information processing in speaker recognition. Adaptive digital filters with variable forgetting factor. Signal quality improvement by digital filtering. Bayesian classification and Naive Bayes algorithm. Application of neural networks in signal prediction and filtration.		
Practical teaching (exercises, OFE, study and research)		Practical exercises involve solving problems from areas that are covered by the content of the subject. Practical exercises also include mentoring work with students in order to perform the project assignments.		
Textbooks/references				
1	P. S. R. Diniz, E. A. B. Silva, S. L. Netto, Digital Signal Processing System Analysis and Design, Cambridge University Press, Second Edition, 2010			
2	C. L. Phillips, J. Parr, E. Riskin, Signals, Systems and Transforms, Pearson, 5th Edition, 2013.			
3	A. V. Oppenheim, R. W. Schaffer, Discrete-Time Signal Processing, Prentice-Hall, 3rd Edition, 2009.			
4	B. P. Lathi, Z. Ding, Modern Digital and Analog Communication Systems, The Oxford Series in Electrical and Computer Engineering, 4th Edition, 2009.			
5	D. G. Manolakis, V. K. Ingle, Applied Digital Signal Processing: Theory and Practice Cambridge University Press; 1st edition, 2011.			
Number of classes of active education per week during semester/trimester/year				
Lectures	Exercises	OFE	Study and research work	Other classes
2	1	0	0	0
Teaching methods		Lectures, PowerPoint presentations, practical exercises, practical training on computers, project assignments, consultations.		
Grade (maximum number of points 100)				
Pre-exam duties		Points	Final exam	Points
Activity during lectures		5	Written exam	20
Exercises		20	Oral exam	20
Colloquia				
Projects		35		