

Specification for the book of courses

Study program		Electrical Engineering and Computer Science		
Module		Common		
Type and level of studies		Doctoral studies		
The name of the course		Information Theory and Source Coding		
Lecturer (for lectures)		Perić H. Zoran, Jovanović Ž. Aleksandra		
Lecturer/associate (for exercises)				
Lecturer/associate (for OFE)				
Number of ECTS	10	Course status (obligatory/elective)	Elective	
Prerequisites				
Course objectives	Disseminating knowledge and getting acquainted with the latest achievements and research in the field of information theory and source coding.			
Course outcomes	The student will acquire knowledge that will enable him to follow professional literature and to engage in scientific research in the field of information theory and source coding.			
Course outline				
Theoretical teaching	Shannon entropy and differential entropy. Other measures for the amount of information and entropy. Markov's chain and hidden Markov models. Rate distortion theory. Source coding with fixed length of code words. Source coding with variable length of code words. Adaptive source coding based on robust quantizers. Coding algorithm based on lifting wavelet transform. Adaptive modulation and coding.			
Practical teaching (exercises, OFE, study and research)	Project assignments.			
Textbooks/references				
1	T. M. Cover, J. A. Thomas, Elements of Information Theory, Wiley-Interscience, 2006.			
2	T. Berger, Rate-Distortion Theory, A Mathematical Basis for Data Compression, Englewood Cliffs, N.J.:Prentice-Hall, 1971			
3	J. Anderson, S. Mohan, Source and Channel Coding an Algorithmic Approach, Hingham, Massachusetts, U.S.A.: Kluwer Academic Pub.,1991.			
4	A. Gersho, R. M. Gray, Vector Quantization and Signal Compression, Kluwer Academic Publishers, 1992.			
5	D. Radunović, Wavelets, Springer, 2009.			
Number of classes of active education per week during semester/trimester/year				
Lectures	Exercises	OFE	Study and research work	Other classes
3	0	0	0	0
Teaching methods	Lectures. Consultations. Scientific research.			
Grade (maximum number of points 100)				
Pre-exam duties	Points	Final exam		Points
Activity during lectures	10	Written exam		
Exercises		Oral exam		40
Colloquia				
Projects	50			