Study Program: Informatics	
Type and level of studies: Bachelor studies	
Course name: Information theory and Secure Coding	
Lecturer: Stefan R. Panić	
Status**:** Compulsory	
ECTS**: 6**	
Attendance Prerequisites**:** /	

Course aims: Familizarising students with the basic postulates of information theory and the basic principles of information coding and compression. Understanding the problem of reliable, accurate and economical transfer of information.

Course outcome: The students have learned the basic techniques and mathematical tools used to quantify the amount of source information, the information transmitted through a channel, and the capacity of a continuous and discrete telecommunication channel. The students will be able to apply the acquired knowledge to design new linear block codes and to analyze the performance of existing, cyclical and convolution linear block codes.

Course content

Theoretical part

Communication systems. The concept of information. Defining the amount of information. Discrete sources without memory. Entropy. Discrete sources with memory. The Markov source. Continuous sources of information. Statistical coding. Immediate code. Compact code. The first Shannon's theorem. Compact code construction methods. Huffman's procedure. Statistical model of channels. Discrete channels capacity. Continuous channels capacity. Basics of secure coding. Second Shannon's theorem. Error probability. Hemming's distance. Viterbi algorithm. Trellis coded modulation. Statistical theory of detection. Optimal detection.

*Practical part /Student research work***:**

Project work.

Literature

1. J.G. Proakis, *Digital Communications*, 4th edition, McGraw-Hill, 2001.,
2. G. Lukatela, *Statistička teorija telekomunikacija i teorija informacija*, Građevinska knjiga, Beograd 1981.,
3. D. Drajić, *Uvod u teoriju informacija i kodovanje*, Akademska misao, Beograd, 2000.

Number of active classes				Other classes
Lectures: 3	Practical classes: 3	Other forms of teaching:	Students' research work	

Teaching methods

Lectures are in accordance with the topic in *course content*, computer practice and independent student research work.

Assessment (maximum 100 points)				
Course assignments	**points**	Final exam	**points**	
activity during lectures	**10**	written exam	**20**	
practical classes		oral exam	**30**	
term test(s)	**30**	....		
seminar(s)	**10**			
Total	**50**		**50**	