

Level: bachelor				
Course title: Information and Coding Theory (code: I364)				
Status: elective				
ECTS: 8				
Requirements: none				
Learning objectives Understanding the principles of the theory of information, coding in the channel without the interference, the principles of the algebraic theory of coding and the importance of those theories in contemporary communication.				
Learning outcomes Minimal: Understanding the concept and importance of the amount of information, the system of communication, developing the capability in solving typical tasks from coding theory, understanding and implementing codes and source of information and solving optimisation problems. Understanding the principles of binary block-codes, solving problems on linear codes. Desirable: More detailed understanding of the notion and features of entropy, especially of the entropy of sources, the capacity of channels, symmetric channels. Algebraic methods in the applications of block-codes, some classes of linear codes and the capability of their usage.				
Syllabus <i>Theoretical instruction</i> Introduction to probability and analysis of the communicative system. Entropy and information. Information source and its entropy. Channel and capacity. Symmetric channels. Unique decoding. Optimality and corresponding codes. The algebraic principles of block-codes. The analysis of different kinds of errors and their detection and correction. Linear codes and other classes of block-codes. Examples of codes in the digital technology. <i>Practical instruction</i> Solving problems related to entropy and the communication system. Constructions of particular code classes and the source of information. Problems in which different errors are detected and corrected by using block-codes. Doing exercises of the application of linear codes. Solving problems from other classes of block-codes.				
Weekly teaching load				Other: 0
Lectures: 3	Exercises: 3	Other forms of teaching: 0	Student research: 0	