

STUDY MODULE DESCRIPTION FORM		
Name of the module/subject Information theory and coding		Code 1010334591010337138
Field of study Information Engineering	Profile of study (general academic, practical) (brak)	Year /Semester 5 / 9
Elective path/specialty Security of Information Technology (IT)	Subject offered in: Polish	Course (compulsory, elective) obligatory
Cycle of study: First-cycle studies	Form of study (full-time, part-time) part-time	
No. of hours Lecture: 8 Classes: - Laboratory: - Project/seminars: 8		No. of credits 3
Status of the course in the study program (Basic, major, other) (brak)		(university-wide, from another field) (brak)
Education areas and fields of science and art		ECTS distribution (number and %)
Responsible for subject / lecturer: dr inż. Ewa Idzikowska email: ewa.idzikowska@put.poznan.pl tel. 61 665 35 31 Wydział Elektryczny ul. Piotrowo 3A 60-965 Poznań		
Prerequisites in terms of knowledge, skills and social competencies:		
1	Knowledge	K_W01: K_W04:
2	Skills	K_U01: K_U03:
3	Social competencies	K_K02:
Assumptions and objectives of the course: The aim of the course is to familiarize students with basic terms concerning coding and transmission of information, optimal codes, redundant codes and data compression.		
Study outcomes and reference to the educational results for a field of study		
Knowledge:		
1. x - [K_W19]		
Skills:		
1. x - [K_U07]		
2. x - [K_U22]		
Social competencies:		
1. x - [K_K01]		
Assessment methods of study outcomes		
Lecture: written exam. More than 50% of all points is necessary for positive result. Projekt: assessment of the project, reports assessment.		
Course description		

<p>Lecture. Basic terms ? information, message, coding of a message, problems related to transmission of information. Metrics for quantity of information in a message; sources of a message, entropy, properties of entropy. Shannon?s information theory. Codes and message coding. Classes of codes, codes decodable without delay. Kraft?s inequality. Data compression; universal compression methods, Shanon-Fano coding, static and dynamic Huffman coding, arithmetic coding and lexical methods. Integration of compression and encryption. Analysis of cryptographic properties of some compression methods. Detection and correction codes; Cyclic Redundancy Check (CRC) codes; Correction codes, Hamming code.</p> <p>Project. Implementation of selected compression algorithms. Calculation of compression coefficients for different files, comparison with entropy. Implementation of CRC codes. Analysis of effectiveness of these codes.</p>		
<p>Basic bibliography:</p> <ol style="list-style-type: none"> 1. Teoria informacji i kodowania, Abramson N., PWN, Warszawa 1969. 2. Wprowadzenie do kompresji danych, Drozdek A., WNT, Warszawa 1999 3. Sieci komputerowe, Tanenbaum A., Helion 2004. 4. Kompresja danych-wprowadzenie, Sayood K., Wydawnictwo RM, Warszawa 2002. 		
<p>Additional bibliography:</p> <ol style="list-style-type: none"> 1. Metody kompresji danych, Heim K., Wydawnictwo MIKOM, Warszawa 2000 2. Ochrona danych i zabezpieczenia w systemach teleinformatycznych, Stokłosa J. (red.), Wydawnictwo PP, Poznań 2003. 3. Information and Coding Theory, Jones G. A., Jones M., Springer 2000. 		
<p>Result of average student's workload</p>		
<p>Activity</p>		<p>Time (working hours)</p>
1. Lectures		8
2. Project		8
3. Preparation for project		24
4. Reports		10
5. Exam preparation		15
6. Consultations and exam		10
<p>Student's workload</p>		
<p>Source of workload</p>	<p>hours</p>	<p>ECTS</p>
Total workload	75	3
Contact hours	40	2
Practical activities	45	2