

<b>STUDY MODULE DESCRIPTION FORM</b>		
Name of the module/subject <b>Information theory and coding</b>		Code <b>1010334491010337138</b>
Field of study <b>Computer Science</b>	Profile of study (general academic, practical) <b>(brak)</b>	Year /Semester <b>5 / 9</b>
Elective path/specialty <b>Safety of Computer Systems</b>	Subject offered in: <b>polish</b>	Course (compulsory, elective) <b>obligatory</b>
Cycle of study: <b>First-cycle studies</b>	Form of study (full-time, part-time) <b>part-time</b>	
No. of hours Lecture: <b>8</b> Classes: <b>-</b> Laboratory: <b>-</b> Project/seminars: <b>8</b>		No. of credits <b>3</b>
Status of the course in the study program (Basic, major, other) <b>(brak)</b>		(university-wide, from another field) <b>(brak)</b>
Education areas and fields of science and art <b>technical sciences</b>		ECTS distribution (number and %) <b>3 100%</b>
<b>Responsible for subject / lecturer:</b>  dr inż. Ewa Idzikowska email: ewa.idzikowska@put.poznan.pl tel. 61 665 35 31 Wydział Elektryczny ul. Piotrowo 3A 60-965 Poznań		
<b>Prerequisites in terms of knowledge, skills and social competencies:</b>		
1	<b>Knowledge</b>	K_W01: K_W04:
2	<b>Skills</b>	K_U01: K_U03:
3	<b>Social competencies</b>	K_K02:
<b>Assumptions and objectives of the course:</b> 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.		
<b>Study outcomes and reference to the educational results for a field of study</b>		
<b>Knowledge:</b>		
1. x - [K_W19]		
<b>Skills:</b>		
1. x - [K_U07]		
2. x - [K_U22]		
<b>Social competencies:</b>		
1. x - [K_K01]		
<b>Assessment methods of study outcomes</b>		
Lecture: written exam. More than 50% of all points is necessary for positive result.		
Projekt: assessment of the project, reports assessment.		
<b>Course description</b>		

<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><b>Basic bibliography:</b></p> <ol style="list-style-type: none"> <li>1. Teoria informacji i kodowania, Abramson N., PWN, Warszawa 1969.</li> <li>2. Wprowadzenie do kompresji danych, Drozdek A., WNT, Warszawa 1999</li> <li>3. Sieci komputerowe, Tanenbaum A., Helion 2004.</li> <li>4. Kompresja danych-wprowadzenie, Sayood K., Wydawnictwo RM, Warszawa 2002.</li> </ol>		
<p><b>Additional bibliography:</b></p> <ol style="list-style-type: none"> <li>1. Metody kompresji danych, Heim K., Wydawnictwo MIKOM, Warszawa 2000</li> <li>2. Ochrona danych i zabezpieczenia w systemach teleinformatycznych, Stokłosa J. (red.), Wydawnictwo PP, Poznań 2003.</li> <li>3. Information and Coding Theory, Jones G. A., Jones M., Springer 2000.</li> </ol>		
<p><b>Result of average student's workload</b></p>		
<p><b>Activity</b></p>		<p><b>Time (working hours)</b></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><b>Student's workload</b></p>		
<p><b>Source of workload</b></p>	<p><b>hours</b></p>	<p><b>ECTS</b></p>
Total workload	75	3
Contact hours	40	2
Practical activities	45	2