WROCŁAW UNIVERSITY OF TECHNOLOGY – PHD STUDIES

FACULTY OF …….

SUBJECT CARD

Course name in Polish	Teoria Informacji dla Informatyków
Course name in English	Information Theory for Computer Scientists
Course language English	
University-wide general course type: 1)basic course (mathematics, physics, chemistry, other) ~~2) humanity course~~ ~~3) managerial skills~~ ~~4) English language~~ ~~5) other modern language~~ ~~Departmental course developing professional skills:~~ ~~1) specialized course~~ ~~2) interdisciplinary course~~ 3) ~~seminar (interdisciplinary, specialized, departmental)~~	
Type of course (obligatory, optional)	
Educational effects according to ZW 26/2017: **P8U_W, P8U_U**	
Subject code INP 9012	

*delete as applicable

	Lecture	Laboratory	Seminar
Number of hours of organized classes in University (ZZU)	30		
Number of hours of total student workload (CNPS)	90		
Form of crediting	Exam **	Exam / crediting with grade*	Oral presentation
Number of ECTS points	3		
including number of ECTS points for practical (P) classes			
including number of ECTS points for direct teacher-student contact (BK) classes			

*delete as applicable **In case of didactic courses also inspections and evaluation classes

PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES

1. Fundamentals of probability theory
2. Discreet mathematics

SUBJECT OBJECTIVES	
C1	Presenting basic facts from Information Theory
C2	Demonstrating how to use IT methods in analysis of algorithms

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SUBJECT EDUCATIONAL EFFECTS

Relating to knowledge:

PEK_W01 Student knows basic concepts of Information Theory
PEK_W02 Student knows chosen IT-methods used for analysis of algorithms

Relating to skills:

PEK_U01 Student can apply IT-methods for analysis of some chosen, simple algorithms
PEK_U02 Student can apply IT-methods for finding bounds for chosen problems.

Relating to social competences:

n/a

PROGRAMME CONTENT

Form of classes - lecture		Number of hours
Lec 1	Introduction – entropy and mutual information	2
Lec 2	Fano's inequality	2
Lec 3	Information theory and compression, Kraft inequality	2
Lec 4	Information theory and compression – lower bounds	2
Lec 5	Capacity of information channel	2
Lec 6	Differential entropy and application in computer science	2
Lec 7	Communication network and information theory	2
Lec 8	Communication network and information theory -advanced methods	2
Lec 9	Information theory in MAC model	2
Lec 10	Kolmogorov complexity	2
Lec 11	Inequalities in information theory	2
Lec 12	Inequalities in information theory and lower bounds	2
Lec 13	Communication complexity and information theory	2
Lec 14	Communication complexity and information theory -energey aspect	2
Lec 15	Revison	2
	Total hours	30

TEACHING TOOLS USED

N1	Classic Lecure
N2	Discussion

EVALUATION OF ACHIEVED SUBJECT EDUCATIONAL EFFECTS

Evaluation: F – forming (partial)	Educational effect number	Way of evaluating achievement of educational effects

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C – concluding		
F1		
F2		
P	All effects	Test
C		

PRIMARY AND SECONDARY LITERATURE
PRIMARY LITERATURE: [1] Thomas M. Cover, Joy A. Thomas *Elements of Information Theory* , Wiley and Sons 2006 [2] Yuichiro Kakihara, Abstract Methods in Information Theory, Springer Verlag 1999

SUBJECT SUPERVISOR (NAME AND SURNAME, E-MAIL ADDRESS)
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