WROCŁAW UNIVERSITY OF TECHNOLOGY – PHD STUDIES

FACULTY OF FUNDAMENTAL PROBLEMS OF TECHNOLOGY

SUBJECT CARD

Course name in Polish: Złożoność komunikacyjna w analizie algorytmów

Course name in English: Communication Complexity in Algorithms Analysis

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 INP9015

*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.
2.

SUBJECT OBJECTIVES	
C1	Presenting fundamental aspects of theoretical analysis of communication complexity
C2	C2 Presenting basic methods of analysis of algorithms based on communication complexity concepts.

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SUBJECT EDUCATIONAL EFFECTS

Relating to knowledge:

PEK_W01 Has a knowledge about fundamental aspects of comunication complexity
PEK_W02 Has a knowledge about advanced methods of analysis of algorithms based on communication complexity.
PEK_W03 Has a knowledge about communication complexity in computer science and technology.

Relating to skills:

PKE_U01 Can analyse communication complexity of simple algorithms
PKE_U02 Can apply communication complexity methods for analysing chosen algorithmic problems.

Relating to social competences:

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PROGRAM CONTENTS		
Form of classes – lecturs		*Number of hours*
Lec 1	Introduction. Basic models of computations.	2
Lec 2	Rectangle method and covers.	2
Lec 3	Covers – advance methods.	2
Lec 4	Randomization – introdution and models.	2
Lec 5	Randomization – pseuorandom sources of information.	2
Lec 6	Disjointness of functions and complexity	2
Lec 7	Multiparty computation – models	2
Lec 8	Multiparty computation – lower bounds	2
Lec 9	Communication complexity in networks	2
Lec 10	Communication complexity in ad hoc networks	2
Lec 11	Communication complexity in ad hoc networks	2
Lec 12		2

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	VLSI and Boolean functions	
Lec13	Depth of Boolean functions	2
Lec 14	Noisy communication channel	2
Lec 15	Communication complexity and information theory	2
	Total hours	**30**

TEACHING TOOLS USED	
N1	Lecture
N2	Discussion during the lecture

EVALUATION OF ACHIEVED SUBJECT EDUCATIONAL EFFECTS		
Evaluation: F – forming (partial) C – concluding	Educational effect number	Way of evaluating achievement of educational effects
~~F1~~		
~~F2~~		
~~P~~		Exam
C		

PRIMARY AND SECONDARY LITERATURE

PRIMARY LITERATURE:

[1] E. Kushlevitz N.Nisan Communication Complexity, Cambridge University Press 2006

SECONDARY LITERATURE:

[1] Tomy LNCS – SIROCCO, Springer Verlag

[2] J. Hromkovic *Communication Complexity and Parallel Computing*, 1997

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