

Faculty of Information and Communication Technology/Department of Fundamentals of Computer Science					
COURSE CARD					
Name of the course in polish	:	Algorytmy rozproszone			
Name of the course in english	:	Distributed Algorithms			
Field of study	:	Algorithmic Computer Science			
Specialty (if applicable)	:				
Level and form of studies	:	II degree, stationary			
Type of course	:	optional			
Course code	:	W04INA-SM4101G			
Group of courses	:	Yes			
	Lectures	Exercides	Laboratory	Project	Seminar
Number of classes held in schools (ZZU)	30	15	15		
The total number of hours of student workload (CNPS)	90	45	45		
Assesment	pass				
For a group of courses final course mark	X				
Number of ECTS credits	2	2	2		
including the number of points corresponding to the classes of practical (P)		2	2		
including the number of points corresponding occupations requiring direct contact (BK)	2	1	1		
PREREQUISITES FOR KNOWLEDGE, SKILLS AND OTHER POWERS					
COURSE OBJECTIVES					
C1 Overview of basic techniques and algorithms used in a distributed environment					
C2 Practicing skills in the construction of distributed algorithms					
C3 Practical implementation of distributed algorithms as well as design and implementation of distributed algorithms in a selected environment					

COURSE LEARNING OUTCOMES

The scope of the student's knowledge:

W1 He knows the problems of designing distributed algorithms

W2 He knows the distributed algorithms presented in the lecture

W3 He knows the techniques of distributed algorithm analysis

The student skills:

U1 Can implement an application that uses distributed algorithms

U2 He can program algorithms distributed in different environments for distributed programming

U3 Is able to carry out a formal analysis of the correctness of a distributed algorithm

The student's social competence:

K1 Can explain the importance of distributed programming

COURSE CONTENT

Type of classes - lectures

Wy1	Introduction	2h
Wy2	Model of communication and measures of complexity	4h
Wy3	Election algorithms	2h
Wy4	Logical time and clocks	2h
Wy5	Broadcasting and convergecast algorithms	2h
Wy6	Routing	2h
Wy7	The problem of consensus	2h
Wy8	The problem of diffuse mutual exclusion	2h
Wy9	Termination detection	4h
Wy10	Deadlock Detection	4h
Wy11	Damage detection	2h
Wy12	Self-stabilization	2h
	Sum of hours	30h

Type of classes - exercises

Ćw1	Design and analysis of distributed algorithms	2h
Ćw2	Model of communication and measures of complexity	2h
Ćw3	Election algorithms	2h
Ćw4	Broadcasting and convergecast algorithms	2h
Ćw5	Routing and the problem of consensus	2h
Ćw6	The problem of distributed mutual exclusion	2h
Ćw7	Detection of termination, deadlock, damage	2h
Ćw8	Self-stabilization	1h
	Sum of hours	15h

Type of classes - laboratory

Lab1	Getting to know the selected environment for the implementation of distributed systems	4h
Lab2	Implementation of distributed algorithms presented during the lecture and exercises	8h
Lab3	Techniques for processing big data (e.g. Map-Reduce)	3h
	Sum of hours	15h

Applied learning tools		
<ol style="list-style-type: none"> 1. Traditional lecture 2. Multimedia lecture 3. Solving tasks and problems 4. Solving programming tasks 5. Consultation 6. Self-study students 		
EVALUATION OF THE EFFECTS OF EDUCATION ACHIEVEMENTS		
Value	Number of training effect	Way to evaluate the effect of education
F1	W1-W3, K1-K1	None
F2	U1-U3, K1-K1	Test
F3	U1-U3, K1-K1	Checking the fulfillment of task lists
$P=0\%*F1+50\%*F2+50\%*F3$		
BASIC AND ADDITIONAL READING		
<ol style="list-style-type: none"> 1. Hagit Attiya, Jennifer Welch, Distributed Computing: Fundamentals, Simulations and Advanced Topics 2. Gerard Tel, Introduction to Distributed Algorithms 3. Ajay D. Kshemkalyani, Mukesh Singhal, Distributed Computing: Principles, Algorithms, and Systems 		
SUPERVISOR OF COURSE		
dr inż. Marcin Zawada		

MATRIX OF LEARNING OUTCOMES FOR THE SUBJECT

Algorytmy rozproszone

WITH LEARNING OUTCOMES IN THE FIELD OF ALGORITHMIC COMPUTER SCIENCE

Subject learning effect	Relating the subject effect to the learning outcomes defined for the field of study	Objectives of the course**	Program content**	Teaching tool number**
W1	K2_W01 K2_W02 K2_W03 K2_W04	C1	Wy1-Wy12	1 2 5 6
W2	K2_W02 K2_W04	C1	Wy1-Wy12	1 2 5 6
W3	K2_W01 K2_W02	C1	Wy1-Wy12	1 2 5 6
U1	K2_U01 K2_U02 K2_U05	C2 C3	Ćw1-Ćw8 Lab1-Lab3	3 4 5 6
U2	K2_U02 K2_U03	C2 C3	Ćw1-Ćw8 Lab1-Lab3	3 4 5 6
U3	K2_U03 K2_U04	C2 C3	Ćw1-Ćw8 Lab1-Lab3	3 4 5 6
K1	K2_K01 K2_K03 K2_K04 K2_K07	C1 C2 C3	Wy1-Wy12 Ćw1-Ćw8 Lab1-Lab3	1 2 3 4 5 6