Zał nr 4 do ZW

Faculty of Fundamental Problems of Technology

COURSE CARD

Name in polish	:	**Algorytmy On-Line**
Name in english	:	**On-Line Algorithms**
Field of study	:	Computer Science
Specialty (if applicable)	:	
Undergraduate degree and form of	:	masters, stationary
Type of course	:	optional
Course code	:	E2_W01
Group rate	:	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)	60	60	60		
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	2	2		

PREREQUISITES FOR KNOWLEDGE, SKILLS AND OTHER POWERS

In this course, theoretical and practical knowledge of the following lectures is demanded: Algorithms and data structures, Discrete mathematics, Probability analysis. A good knowledge of at least one programming language is also necessary.

COURSE OBJECTIVES

C1 Aquainting students with basics of on-line analysis

C2 Preparing students to designing and analyzing on-line algorithms.

C3 Preparing students to implementation and testing of on-line algorithms.

COURSE LEARNING OUTCOMES

The scope of the student's knowledge:

W1 Understands the difference in cost estimation between the traditional and on-line models.

W2 Knows basic algorithm introduced at the lecture.

W3 Knows advanced algorithm introduced at the lecture.

The student skills:

U1 Knows how to use mathematical knowledge to algorithm analysis.

U2 Knows how to point out non-optimal solutions in the on-line model.

U3 Knows how to use randomized algorithms for more effective solutions of given problems.

The student's social competence:

K1 Understands the need for in-depth analysis of a given algorithmic problem and its importance in the on-line model.

COURSE CONTENT

Type of classes - lectures		
Wy1	Ski rental and other basic problems.	4h
Wy2	List reorganization	4h
Wy3	Cache memory.	4h
Wy4	Load balancing.	2h
Wy5	Routing.	2h
Wy6	Adaptive adversaries.	2h
Wy7	Algorithms for file allocation.	6h
Wy8	The k-server problem.	2h
Wy9	Auctions.	2h
Wy10	Comparison of adversarial models.	2h
Type of classes - exercises		
Ćw1	Ski rental and list reorganization.	3h
Ćw2	Cache memory.	2h
Ćw3	Load balancing.	2h
Ćw4	Routing.	2h
Ćw5	Adaptive adversaries.	2h
Ćw6	File migration.	2h
Ćw7	The k-server problem.	2h
Type of classes - laboratory		
Lab1	Basic on-line algorithms.	5h
Lab2	Cache memory.	5h
Lab3	Analysis of stock market data.	5h

Applied learning tools
1. Traditional lecture 2. Solving tasks and problems 3. Solving programming tasks 4. Consultation 5. 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	
F2	U1-U3, K1-K1	
F3	U1-U3, K1-K1	
P=%*F1+%*F2+%*F3		

BASIC AND ADDITIONAL READING
1. ONLINE COMPUTATION AND COMPETITIVE ANALYSIS, Allan Borodin, Ran El-Yaniv

SUPERVISOR OF COURSE
dr Maciej Gębala

RELATIONSHIP MATRIX EFFECTS OF EDUCATION FOR THE COURSE
On-Line Algorithms
WITH EFFECTS OF EDUCATION ON THE DIRECTION OF COMPUTER SCIENCE

Course training effect	Reference to the effect of the learning outcomes defined for the field of study and specialization (if applicable)	Objectives of the course**	The contents of the course**	Number of teaching tools**
W1	K2_W01 K2_W02 K2_W04_A	C1	Wy1-Wy10	1 4 5
W2	K2_W01 K2_W02 K2_W03_A K2_W04_A	C1	Wy1-Wy10	1 4 5
W3	K2_W01 K2_W02 K2_W03_A K2_W04_A	C1	Wy1-Wy10	1 4 5
U1	K2_U09_A K2_U12_A K2_U13	C2 C3	Ćw1-Ćw7 Lab1-Lab3	2 3 4 5
U2	K2_U08_A K2_U12_A K2_U13	C2 C3	Ćw1-Ćw7 Lab1-Lab3	2 3 4 5
U3	K2_U12_A K2_U13 K2_U15	C2 C3	Ćw1-Ćw7 Lab1-Lab3	2 3 4 5
K1	K2_K12 K2_K13	C1 C2 C3	Wy1-Wy10 Ćw1-Ćw7 Lab1-Lab3	1 2 3 4 5