(*faculty stamp*)

COURSE DESCRIPTION

1. Course title: THEORY OF COMPUTER SCIENCE	**2. Course code**
3. Validity of course description: 2017/2018	
4. Level of studies: 1st cycle of higher education	
5. Mode of studies: intramural studies	
6. Field of study: MAKROKIERUNEK	(FACULTY SYMBOL) AEII
7. Profile of studies: academic	
8. Programme: all	
9. Semester: 4, 5	
10. Faculty teaching the course: Instytut Informatyki / Zakład Teorii Informatyki RAu2	
11. Course instructor: dr inż. Robert Brzeski	
12. Course classification: common subject	
13. Course status: compulsory	
14. Language of instruction: English	
15. Pre-requisite qualifications: none	
16. Course objectives: The aim of the lecture is to delivery to students the information in the range of the basic notions of computer science. The aim of the classes and laboratory is to purchase by the students the skill in the range of creating the algorithms, low-level programming, understanding of works of microprocessors and introduction with the basic structures of the data.	
17. Description of learning outcomes:	

Nr	Learning outcomes description	Method of assessment.	Teaching methods	Learning outcomes reference code
1.	Posiada podbudowaną teoretycznie wiedzę z zakresu metod projektowania urządzeń cyfrowych w podstawowych technologiach (w tym programowalnych) oraz ich oddziaływania na otoczenie. Student has theoretical knowledge in the range of designing method of digital devices in basic technology.	Lecture.: written test.	Lecture.	K1A_W4
2.	Ma uporządkowaną, szczegółową wiedzę z zakresu arytmetyki układów logicznych, projektowania i działania cyfrowych układów kombinacyjnych, sekwencyjnych i mikroprogramowalnych oraz architektury, projektowania i oprogramowania systemów mikroprocesorowych, w tym systemów wbudowanych. Student has knowledge in the range of arithmetic of logic system, designing and working of digital system and also architecture, designing and programming of embedded system.	Lecture.: written test.	Lecture, Class, Laboratory.	K1A_W10
3.	Zna podstawowe struktury danych i wykonywane na nich operacje oraz strategie doboru właściwych struktur danych do zadania algorytmicznego. Student knows the basic data structures and operations executed on them and the selection strategies of the proper data structures to the algorithmic task.	Lecture.: written test. Class.: written test. Laboratory.: execution of task, report.	Lecture, Class, Laboratory.	K1A_W12

4.	Potrafi pozyskiwać informacje z literatury, baz danych i innych źródeł; potrafi integrować uzyskane informacje, dokonywać ich interpretacji, a także wyciągać wnioski oraz formułować i uzasadniać opinie. Student is able to gain over information from literature, technical records, the database and another source, to integrate them, make their interpretation and draw out conclusions and formulate opinions.	Class.: written test. Laboratory.: execution of task, report.	Lecture, Class, Laboratory.	K1A_U1
5.	Potrafi analizować algorytmy oceniać ich złożoność obliczeniową i oszacować złożoność problemów. Student is able to analyse algorithms, to estimate their computational complexity and to estimate the complexity of problems.	Lecture.: written test. Laboratory.: execution of task, report.	Lecture, Laboratory.	K1A_U11
6.	Rozumie potrzebę uczenia się przez całe życie, potrafi inspirować i organizować proces uczenia się innych osób. Student understands the need of learning throughout the whole life; is able to inspire and organize the learning process of another persons.	Laboratory.: execution of task.	Lecture, Laboratory.	K1A_K1

18. Teaching modes and hours

Sem 4 - Lecture 30 h., Class 30 h.,

Sem 5 - Laboratory 30 h

19. Syllabus description:

Semester 4 :

Lecture:

1. Algorithms
2. Turing machine
3. Introduction to formal grammars
4. Formal grammars - examples
5. Basic components of a computer
6. Introduction to architecture of a computer
7. Von Neumann's architecture, introduction to machine W
8. Designing an instruction set for machine W
9. Program control unit for machine W
10. Programming in assembly language of machine W
11. Advance programming in assembly language of machine W
12. Input / Output functionality
13. Interrupts
14. Introduction to operating systems
15. Problems of management of resources and synchronization

Class:

1. Algorithms,
2. Turing machine
3. Formal grammars
4. Designing instructions for machine W
5. Programming in assembly language of machine W
6. Management of resources and synchronization

Semester 5 :

Laboratory:

1. Designing instructions for machine W,
2. Programming in assembly language of machine W
3. Machine W - Input/Output
4. Machine W - Interrupts
5. Data access methods
6. Turing machine

20. Examination: none

21. Primary sources:

Tanenbaum, Andrew S.: "Structured Computer Organization"

Hennessy, John L., Patterson, David A.and Goldberg, David: "Computer Architecture: A Quantitative Approach"

Stallings, William: "Computer Organization and Architecture: Designing for Performance"

22. Secondary sources:

http://nand2tetris.org/

23. Total workload required to achieve learning outcomes

Lp.	Teaching mode :	Contact hours / Student workload hours
1	Lecture	30/30
2	Classes	30/60
3	Laboratory	30/60
4	Project	0/0
5	BA/ MA Seminar	0/0
6	Other	0/0
	Total number of hours	90/150

24. Total hours: 90 + 150 = 240

25. Number of ECTS credits: 5+3=8

26. Number of ECTS credits allocated for contact hours: 3

27. Number of ECTS credits allocated for in-practice hours (laboratory classes, projects): 3

26. Comments:

Approved:

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(date, Instructor's signature) (*date , the Director of the Faculty Unit signature)*