DESCRIPTION OF THE COURSE OF STUDY

Course code	**0719-2ID-C26-OSK**	
Name of the course in	Polish	***Organizacja systemów komputerowych***
	English	***Organization of computer systems***

1. **LOCATION OF THE COURSE OF STUDY** within the system of studies

1.1. Field of study	**Data engineering**
1.2. Mode of study	**Full-time studies**
1.3. Level of study	**First degree**
1.4. Profile of study*	**General Academic**
1.5. Person/s preparing the course description	**Dr inż. Tomasz Ruść**
1.6. Contact	**tomasz.rusc@ujk.edu.pl**

2. **GENERAL CHARACTERISTICS OF THE** course of study

2.1. Language of instruction	**English**
2.2. Prerequisites*	

3. **DETAILED CHARACTERISTICS OF THE COURSE OF STUDY**

3.1. **Form of classes**		**lectures, laboratories, individual work**
3.2. **Place of classes**		**Traditional classes in didactic rooms of JKU**
3.3. **Form of assessment**		**lectures – exam,** **laboratory exercises – pass with grade,** **individual work (project) – pass without grade**
3.4. **Teaching methods**		**lecture, computer laboratory classes**
3.5. **Bibliography**	**Required reading**	S. Harris, D. Harris Digital Design and Computer Architecture RISC-V Edition, Elsevier 2022
	Further reading	D. Patterson, J. Hennessy, Computer organization and design RISC V Edition , Elsevier 2021

4. **OBJECTIVES, SYLLABUS CONTENT AND INTENDED LEARNING OUTCOMES**

4.1. **Course objectives** ***(including form of classes)***

Lecture:

C1. Learning data representation standards.

C2. Presenting the fundamentals of digital technology in the field of simple combinational and sequential circuits.

C3. Presenting the main functional blocks of the RISC architecture.

Laboratory exercises:

C1. Acquiring skills in the design and optimization of simple combinational circuits.

C2. Acquiring skills in processing data represented in various standards.

C3. Acquiring skills in analyzing and modifying programs in a low-level language.

4.2. **Detailed syllabus** ***(including form of classes)***

Semester 1

Overview of basic data representation standards. Boolean arithmetic. Combinational circuit design. Optmization methods for combinational circuits. Sequential circuit design. Data flow analysis using timing diagrams.

Semester 2

The principle of operation of basic digital blocks (adders, registers, memory).
Architecture of single-cycle, multi-cycle, and pipelined processors. Basics of the RISC architecture. Basics of machine language. Microarchitecture (single-cycle, multi-cycle, and pipelined architecture). Types of memory (cache, virtual memory).

4.3 Intended learning outcomes

Code	A student, who passed the course	Relation to learning outcomes
within the scope of **KNOWLEDGE:**		
W01	Has knowledge of the principle of operation of logic gates and basic digital circuits: combinational and sequential.	ID1A_W11
W02	Has knowledge of the basic blocks and combinational elements of a processor and other computer components.	ID1A_W11
W03	Knows data types and how they are processed byprocessors.	ID1A_W11
within the scope of **ABILITIES:**		
.U01	Can design a simple combinational circuit based on given a function equation	ID1A_U05
U02	Can analyze the operation of combinational and sequential circuits	ID1A_U05
U03	Can analyze simple data processing programs	ID1A_U06
within the scope of **SOCIAL COMPETENCE:**		
...K01	Is aware of the role of an engineer in providing the public with competent information on the operation and method of processing data by a processor	ID1A_K03

4.4. **Methods of assessment of the intended learning outcomes**

Teaching outcomes *(code)*	Method of assessment (+/-)								
	Exam oral/written*			Test*			Indyvidual Work*		
	Form of classes			*Form of classes*			*Form of classes*		
	L	*C*	*P*	*L*	*C*	*P*	*L*	*C*	*P*
...W01				+	+			+	
W02				+	+			+	
W03				+	+			+	
...U01				+	+			+	+
U02				+	+			+	+
...U03				+	+			+	+
...K01				+	+				

**delete as appropriate*

4.5. **Criteria of assessment of the intended learning outcomes**

Form of classes	Grade	Criterion of assessment
lecture (L)	3	Achieving <50-60)% of the requirements used in the assessment methods
	3,5	Achieving <60-70)% of the requirements used in the assessment methods
	4	Achieving <70-80)% of the requirements used in the assessment methods
	4,5	Achieving <80-90)% of the requirements used in the assessment methods
	5	Achieving <90-100)% of the requirements used in the assessment methods
Classes (C)	3	Achieving <50-60)% of the requirements used in the assessment methods
	3,5	Achieving <60-70)% of the requirements used in the assessment methods
	4	Achieving <70-80)% of the requirements used in the assessment methods
	4,5	Achieving <80-90)% of the requirements used in the assessment methods
	5	Achieving <90-100)% of the requirements used in the assessment methods
Project (P)	3	Achieving <50-60)% of the requirements used in the assessment methods
	3,5	Achieving <60-70)% of the requirements used in the assessment methods
	4	Achieving <70-80)% of the requirements used in the assessment methods
	4,5	Achieving <80-90)% of the requirements used in the assessment methods
	5	Achieving <90-100)% of the requirements used in the assessment methods

5. **BALANCE OF ECTS CREDITS – STUDENT'S WORK INPUT**

Category	Student's workload	
	Full-time	Extramural studies

	studies	
NUMBER OF HOURS WITH THE DIRECT PARTICIPATION OF THE TEACHER /CONTACT HOURS/	***105***	
*Participation in lectures**	***15(Term I)+ 15 Term(2) =30***	
*Participation in classes, seminars, laboratories**	***30(Term I)+ 15 Term(2) =45***	
Project	***30***	
INDEPENDENT WORK OF THE STUDENT/NON-CONTACT HOURS/	***70***	
*Preparation for the lecture**	***10***	
*Preparation for the classes, seminars, laboratories**	***10***	
*Preparation for the exam/test**	***30***	
Individual work	***20***	
TOTAL NUMBER OF HOURS	***175***	
ECTS credits for the course of study	**3(TermI) + 4(Term II) = 7 ECTS**	

****delete as appropriate***

Accepted for execution *(date and legible signatures of the teachers running the course in the given academic year)*

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