STUDY MODULE DESCRIPTION FORM

Name of the module/subject		Code
Computer architecture		**1010331521010331927**
Field of study	Profile of study (general academic, practical)	Year /Semester
Information Engineering	**general academic**	**1 / 2**
Elective path/specialty	Subject offered in:	Course (compulsory, elective)
-	**Polish**	**obligatory**
Cycle of study:	Form of study (full-time,part-time)	
First-cycle studies	**full-time**	
No. of hours		No. of credits
Lecture: **30** Classes: **-** Laboratory: **30** Project/seminars: **-**		**6**
Status of the course in the study program (Basic, major, other)	(university-wide, from another field)	
other	**university-wide**	
Education areas and fields of science and art		ECTS distribution (number and %)
technical sciences		**6 100%**
Technical sciences		**6 100%**

Responsible for subject / lecturer:

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Prerequisites in terms of knowledge, skills and social competencies:

1	**Knowledge**	Student has organized knowledge with theoretical foundations of analog and digital electronic circuits and programmable circuits - K_W03
2	**Skills**	Student can by herself/himself acquire knowledge from the literature, databases and other sources; can also integrate the acquired knowledge, interpret it, reason, formulate conclusions and justify them. - K_U01 Student is able to built, troubleshoot, and test simple electronic circuits and programmable circuits. In case of an error detection stdent can perform it diagnosis. - K_U08
3	**Social competencies**	Student understands and is aware of the importance of nontechnical issues related to computer engineer activity. Student understands the responsibility associated to his engineering decisions. - [K_K02]

Assumptions and objectives of the course:

The aim of this course is to present how modern computers work and are built. We will study the organization of central processing unit, memory subsystems, buses and interfaces. After taking the practical classes the student should be able: to write low level application for input-output control and develop interrupt service routines.

Study outcomes and reference to the educational results for a field of study

Knowledge:

1. Student has organized knowledge with theoretical foundations of computer architecture, principles of operation of operating systems and types of operating systems - [K_W06]
2. Student is knowledgeable with the state of art and modern trends in software engineering and computing skills - [K_W19]

Skills:

1. Student is able to do critical analysis of computer hardware operations, operating system and computer networks - [K_U11]
2. Student is able to use programming environments and platforms to write, perform and test simple programs coded in imperative programming languages - [K_U10]

Social competencies:

1. Student understands and is aware of the importance of nontechnical issues related to computer engineer activity. - [K_K02]

Assessment methods of study outcomes

Lecture: written exam

Laboratory: exercises assesment, two tests

Course description

Lecture: General computer architecture. Machine level representation of data. Basic arithmetic operations. Assembler and machine language. Memory architecture and organization. Memory protection. Exceptions. Interfaces and communication. CPU organization. Pipelining. Superscalar processor. Examples of RISC processors. CISC processors. VLIW and EPIC processors. Multiprocessor systems. Multicomputer systems. Multithreaded processor. Multicore processor. Evaluation of computer performance. Alternative architectures. Technology trends.

Laboratory: The 8-bit processor architecture and machine language programming. The x86 processors architecture and assembler programming. Fixed-point and floating-point operations. System bus. Input-output. Interrupt service routines. File system organization. Performance evaluation.

Basic bibliography:

1. Stallings, W., Organizacja i architektura systemu komputerowego, WNT, Warszawa, 2004

2. Null L., Lobur J., Struktura organizacyjna I architektura systemów komputerowych, Helion, Gliwice, 2004

Additional bibliography:

1. Hennessy J.L., Patterson D.A., Computer Architecture A Quantitative Approach Fifth Edition, Morgan Kaufmann Publishers, San Francisco, 2011

2. Metzger P., Anatomia PC, Helion, Gliwice, 2007

Result of average student's workload

Activity	Time (working hours)
1. Lectures	30
2. Laboratory	30
3. Preparation for laboratory	30
4. Preparation for tests	20
5. Preparation for exam	30
6. Consultations and exam	10

Student's workload

Source of workload	hours	ECTS
Total workload	150	6
Contact hours	70	3
Practical activities	40	2