MODULE DESCRIPTION

Module code	
Module name	**Architektura systemów komputerowych 2**
Module name in English	**Computer Systems Architecture 2**
Valid from academic year	**2012/13**

MODULE PLACEMENT IN THE SYLLABUS

Subject	**Computer Science**
Level of education	**1st degree** *(1st degree / 2nd degree)*
Studies profile	**General** *(general / practical)*
Form and method of conducting classes	**Full-time** *(full-time / part-time)*
Specialisation	
Unit conducting the module	**The Department of Computer Science**
Module co-ordinator	**Roman Stanisław Deniziak, PhD hab., Eng., Professor of the University**
Approved by:	

MODULE OVERVIEW

Type of subject/group of subjects	**Major** *(basic / major / specialist subject / conjoint / other HES)*
Module status	**Compulsory** *(compulsory / non-compulsory)*
Language of conducting classes	**Polish**
Module placement in the syllabus - semester	**3rd semester**
Subject realisation in the academic year	**Winter semester** *(winter / summer)*
Initial requirements	**Arithmetic and Logic Systems, Computer Systems Architecture 1** *(module codes / module names)*
Examination	**Yes** *(yes / no)*
Number of ECTS credit points	**5**

Method of conducting classes	Lecture	Classes	Laboratory	Project	Other
Per semester	**30**			**15**	

TEACHING RESULTS AND THE METHODS OF ASSESSING TEACHING RESULTS

Module target	The aim of the module is to familiarise students with: the structure of modern RISC processors, superscalar and multi-core processors, as well as with the principles of pipelining and parallel processing. Another aim is to acquaint students with the ability to design microprogrammed control.

Effect symbol	Teaching results	Teaching methods *(l/c/l/p/other)*	Reference to subject effects	Reference to effects of a field of study
W_01	Knowledge of the structure and operation as regards RISC, superscalar, and multithreaded processors.	l	K_W08	T1A_W03
W_02	Knowledge of parallel computer architecture.	l	K_W08	T1A_W03
W_03	Knowledge of the structures and designing principles of microprogrammed control units.	l	K_W08	T1A_W04 T1A_W07
W_04	Knowledge of the directions of development as regards computer systems architecture.	l	K_W18	T1A_W05
U_01	The ability to design microprogrammed control units.	p	K_U02 K_U03 K_U14	T1A_U02 T1A_U03 T1A_U09 T1A_U14 T1A_U16
K_01	Teamwork.	p	K_K03	T1A_K03

Teaching contents:

Teaching contents as regards lectures

Lecture number	Teaching contents	Reference to teaching results for a module
1	The directions of development concerning computer systems architecture.	W_04
2	The structure and operation of the microprogrammed control unit.	W_03, U_01
3	The methods of ordering microorders.	W_03, U_01
4	A microprogrammed control unit (controlling a procesor).	W_03, U_01
5	Techniques applied in dual-core processors.	W_04
6	The principles of pipelining.	W_01
7	Optimisation methods as regards pipeline order execution. Hop forecasting.	W_01
8	RISC processors.	W_01
9	Optimisation methods of carrying out programs in RISC processors.	W_01
10	Superscalar processors.	W_01
11	Parallel architectures, Flynn's classification, and vector processes.	W_02
12	SMP architectures.	W_02
13	Cluster architectures, CCNUMA, and COMA.	W_02
14	Hardware support of an operating system.	W_04
15	The architectures of modern supercomputers.	W_02 W_04

The characteristics of project assignments

The subject matter covers designing a microprogrammed control unit for the processor with the assigned internal structure and order list. As part of the project, a student ought to:

- design order formats
- design a microprogram in a symbolic form

- design the structure of a microprogrammed control unit
- encrypt microorders and distribute them in microprogram memory
- implement a processor using ready-made modules using Quartus II design environment, prepare a testing program, and make a simulation verifying the correctness of executing all orders

The methods of assessing teaching results

Effect symbol	Methods of assessing teaching results *(assessment method, including skills – reference to a particular project, laboratory assignments, etc.)*
W_01	An examination
W_02	An examination
W_03	An examination
W_04	An examination
U_01	Obtaining a credit for the project on the basis of a report

STUDENT'S INPUT

ECTS credit points		
	Type of student's activity	**Student's workload**
1	Participation in lectures	**30**
2	Participation in classes	
3	Participation in laboratories	
4	Participation in tutorials (2-3 times per semester)	**3**
5	Participation in project classes	**15**
6	Project tutorials	**15**
7	Participation in an examination	**2**
8		
9	**Number of hours requiring a lecturer's assistance**	**65** *(sum)*
10	**Number of ECTS credit points which are allocated for assisted work** *(1 ECTS credit point=25-30 hours)*	**3**
11	Unassisted study of lecture subjects	**15**
12	Unassisted preparation for classes	
13	Unassisted preparation for tests	
14	Unassisted preparation for laboratories	
15	Preparing reports	
16	Preparing for a final laboratory test	
17	Preparing a project or documentation	**15**
18	Preparing for an examination	**30**
19	Preparing questionnaires	
20	**Number of hours of a student's unassisted work**	**60** *(sum)*
21	**Number of ECTS credit points which a student receives for unassisted work** *(1 ECTS credit point=25-30 hours)*	**2**
22	**Total number of hours of a student's work**	**125**
23	**ECTS credit points per module** *1 ECTS credit point=25-30 hours*	**5**

24	**Work input connected with practical classes** *Total number of hours connected with practical classes*	**45**
25	**Number of ECTS credit points which a student receives for practical classes** *(1 ECTS credit point=25-30 hours)*	**2**