

## COURSE DESCRIPTION

### THE HIGHER VOCATIONAL STATE SCHOOL IN WLOCLAWEK

#### Course: ARCHITECTURE OF COMPUTER SYSTEMS

<b>Field of study:</b>	Computer Science						<b>Course code:</b>
<b>Unit supervising the course:</b>	Department of Computer Science						
<b>Course orientation:</b>	PRACTICAL						
<b>Language of instruction:</b>	English						
<b>Course type:</b>	General						
<b>Course status:</b>	Mandatory						
<b>Level:</b>	<b>Year:</b>			<b>Semester:</b>			
<b>The number of teaching hours on the full-time programme:</b>							
<b>Total</b>	<b>lecture</b>	<b>classes</b>	<b>laboratory</b>	<b>projects</b>	<b>tutorials</b>	<b>seminars</b>	<b>practicum</b>
30	15	-	15	-	-	-	-
<b>The number of teaching hours on the part-time programme:</b>							
<b>Total</b>	<b>lecture</b>	<b>classes</b>	<b>laboratory</b>	<b>projects</b>	<b>tutorials</b>	<b>seminars</b>	<b>practicum</b>
-	-	-	-	-	-	-	-
<b>Learning outcomes:</b>	<b>Knowledge:</b> The student has a basic knowledge of the organization and interaction of the components of typical computer system required to understand the principles of operation of modern computer systems. (K_W03)						
	<b>Skills:</b> The student is able to plan and carry out experiments, including computer simulations, and is able to interpret the results and draw conclusions. (K_U02)						
	<b>Social competence:</b> The student has a sense of responsibility for their own work and the willingness to submit to the work rules in a team and to take responsibility for collaborative tasks. (K_K04)						

<p><b>Full description of the course:</b></p>	<p><b>Lecture program:</b></p> <ul style="list-style-type: none"> <li>- Components and the structure of simple computer system.</li> <li>- Operational memory, memory cell, memory address, memory address space.</li> <li>- Positional number systems: binary, hexadecimal.</li> <li>- Representation of typical data structures in computer memory. Integer number systems: binary, 2s-complement system. Representation of floating point numbers in computer memory.</li> <li>- Instruction realization cycle and pipeline processing of program instructions.</li> <li>- Memory addressing modes for IA-32 architecture: memory segmentation and paging mechanisms.</li> <li>- Selected groups of instruction for IA-32 architecture microprocessors.</li> <li>- Basic implementation concepts of iterative and branched algorithms in low-level programming languages on example of IA-32 assembly language.</li> <li>- Stack organization. Stack access instructions.</li> <li>- Interrupts system. Interrupts handling mechanisms.</li> <li>- Procedure calls and returns from subprograms.</li> <li>- Modern trends in computing. From one-processor to multicore computing.</li> </ul> <p><b>Laboratory exercises:</b></p> <p>Implementation of laboratory tasks (arithmetic operations, branching algorithms, handling of file systems on example of FAT16) using assembly and high-level programming languages.</p>	
<p><b>Methods:</b></p>	<p><b>Lecture:</b></p> <p>Lecture and multimedia presentation.</p> <p><b>Laboratory exercises:</b></p> <p>Implementation of algorithms in assembly and high-level programming languages.</p>	
<p><b>The student's workload/ ECTS credits:</b></p>	<p><b>Forms of activities</b></p>	<p><b>Average number of hours to complete activities</b></p>

<p>1) included in the teaching load:  - lectures (15)  - laboratory exercises (15)</p> <p>2) not included in the teaching load:  - personal consultation (6)  - e-mail consultation (6)  - course credit (6)</p>		Full-time		Part-time	
		Lecture	Classes	Lecture	Classes
	<b>Contact hours with academic instructor</b>	25	25	-	-
	<b>Hours without academic instructor</b>	50	50	-	-
	1. Preparation for the classes, including reading assignments	25	15	-	-
	2. Processing the quantitative data /preparation for the exam, evaluation tests, etc.	25	20	-	-
	3. Preparation of a report, presentation, discussion	-	15	-	-
	<b>Total</b>	<b>75</b>	<b>75</b>	-	-
	<b>Total number of ECTS for the conducted form of classes</b>	<b>3</b>	<b>3</b>		
	<b>Total number of ECTS points for the entire course</b>	<b>6</b>			
<b>The type and mode of obtaining the credit and marking criteria or requirements:</b>	<b>The type:</b> Lecture – credit with a mark. Laboratory exercises – credit with a mark.				
	<b>The mode:</b> Lecture – one lecture test. Laboratory exercises – implementation of algorithms as separate programs. Presentation of programs.				

	<p><b>Basic assessment criteria:</b></p> <p>Lecture – one test of the material presented during lectures for positive mark.</p> <p>Laboratory exercises – realization of all appointed tasks each at least for a positive mark.</p>
<p><b>Literature:</b></p>	<p><b>Prescribed reading:</b></p> <p>[1] W. Stallings, “Computer Organization and Architecture”, 2012.</p> <p>[2] F. Ramdianee, “x86 Assembly”, LAP Lambert Academic Publishing AG &amp; Co KG, 2010.</p> <p>[3] R. Blum, “Professional Assembly Language”, Wrox Press, 2005.</p> <p><b>Recommended reading:</b></p> <p>[1] Intel processors manuals (available on internet).</p> <p>[2] D. Patterson, J. Hennessy, “Computer Organization and Design”, MK, 2011.</p>
<p><b>Course instructor:</b>  <b>Dariusz Puchala, PhD</b></p>	