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| Study Program: Informatics | | | |
| Type and level of studies: Bachelor studies | | | |
| Course name: Organization and Architecture of Digital Computers | | | |
| Lecturer: Stamenković M. Negovan | | | |
| Status: Compulsory | | | |
| ECTS: 7 | | | |
| Attendance Prerequisites: Basics of Computer Technics. | | | |
| Course aims: Acquiring basic knowledge of the microprocessor, registers, computer organization, memory, cache memory, system bus and computer peripherals. | | | |
| Course outcome: The students possess basic knowledge about microprocessor, registers, computer organization, memory, cache memory, system bus and computer peripherals. | | | |
| Course content | | | |
| Virtual machines - levels. Computer structure. CPU architecture. Programmatically available register set. Instructions format. Addressing ways. Instructions set. Transportation instructions. Arithmetical instructions. Logical instructions. Movement and circular movement instructions. Jumper instructions. Other instructions. Interruption mechanism. Interruption sources. Handling interruption and rollback. Interruption priority and mask. Masking maskable interrupts - interruption deny. Interruptions layering. CPU workflow management. Instructions flow diagram. CPU operations and synchronization. CPU structure and microservices. Wired realization of CPU management unit. Micro realization of CPU management unit. Bus organization. Arbitration methods (centralized and distributed arbitration). Bus synchronization (synchronous and asynchronous management). Hierarchy organization. High level system bus organization. Organization of IO. Base techniques. IO device controllers. Programable IO devices with bit ready check. Programable IO devices with interruption mechanism. Direct access controllers (DMA). DMA controlled IO devices. Memory and memory transportation. Peripheral controller with DMA. Direct peripheral control. Multiplex inputs. Seven-segment display control. Keyboard control. D/A and A/D controller linking. Computer communications basics. Memory. Basics and classification. Memory module access overlay. Cache memory. Associative mapping. Direct mapping. Associative memory set. Virtual memory. | | | |
| Literature | | | |
| 1. Vanco Litovski, Osnovi elektronike : Teorija, reseni zadaci i ispitna pitanja; Akademska misao; 2006 | | | |
| 2. Ivan Popović, Digitalna elektronika zbornik rešenih problema ; Akademska misao; 2006 | | | |
| 3. Miomir Filipović, Komponente i praktična realizacija elektronskih uređaja; MikroElektronika; 2008 | | | |
| Number of active classes | | | Other classes |
| Lectures: 3 | Practical classes: 3 | Other forms of teaching: | |
| Teaching methods | | | |
| Lectures, auditory practice, laboratory, term tests, consulting, homework, written exam. | | | |
| Assessment (maximum 100 points) | | | |
| Course assignments | Points | Final exam | |
| activity during lectures | 10 | written exam | |
| practical classes | 20 | oral exam | |
| term test(s) | 20 | | |
| seminar(s) | | | |
| Total | 50 | 50 | |