Name: **Introduction to Computer Architectures**	*NEPTUN-code:* *NIESA1EBNE*	*Number of periods/week (lec/sem/lab):* full-time: 2 lec + 0 sem + 2 lab
Credits: 4 *Requirement:* exam		*Prerequisite:* -
Responsible: Dezső SIMA, DSc	*Position:* professor emeritus	*Faculty and Institute name:* John von Neumann Faculty of Informatics Institute of Applied Informatics
Way of assessment: - written mid-term, written exam		
Competences		
Course description		
The lectures present relevant knowledge about instruction level architectures and the microarchitecture of traditional Neumann computers. The material presented is based on the design space approach. Case examples and major trends will be given to illustrate the evolution. Course description: Computational models and architectures. Data based computational models, the von Neumann computational model, data flow computational model. The concept of computer architecture and different levels of abstraction. ISA. Memory space and register space. Data types, operations, operand-types, instruction formats, addressing methods. User visible status. RISC and CISC architectures, and main dimensions of the most popular ISAs. Execution units. Operation, principles of parallel addition and multiplication. Basics of bus-systems, alternatives of organizing bus operations, signal systems, classes of bus systems, parallel and serial buses, speed limit of parallel buses, basic characteristics of parallel and serial buses (FSB, PCI, PCIe, HT, QPI). Programmed I/O, memory mapped I/O, DMA, I/O channel. The interrupt system. Operation of DRAMs, types of DRAMs (SDRAM, DDR, DDR2, DDR3, 3D RAM). Characteristics of DIMMs (UDIMM, RDIMM, ECC).		
Literature		
Sima, Fountain, Kacsuk: Modern Computer Architectures, Szak Kiadó, 1998 (in Hungarian) Computer Architecture by J.L. Henessy and D. A. Patterson, 5th ed, Elsevier, 2011 Computer Organization and architecture by W. Stallings, 10th ed, Pearson, 2016 Digital Design and Computer Architercture by S.L. Harris, D.M. Harris, ARM Edition, Elsevier, 2016 Conputer Organization and Design by J.L. Henessy and D. A. Patterson, ARM ed, Elsevier, 2016		