

Course title: Computer Systems

Course code: 63509

ECTS: 6

Professor: Branko Šter

Undergraduate/ master program

Prerequisite knowledge:

Knowing basics of computer systems architecture, at least basic programming skills.

Short course description:

Advanced instruction-level parallelism: Dynamic scheduling, branch prediction, speculative execution

Thread-Level Parallelism: Shared-Memory Architectures, Symmetric Shared-Memory Multiprocessors, Multicores, Distributed Shared-Memory, Coherence, Synchronization, Memory Consistency

Data-Level Parallelism: Vector Architectures, SIMD Instruction Set Extensions, Graphics Processing Units, Loop-Level Parallelism

Request-Level Parallelism: Distributed memory systems , Warehouse-Scale Computers, Cloud Computing, , interconnection networks, cooling

Domain-Specific Architectures: Accelerator Architectures, Deep Neural Networks, Tensor Processing Units, CPUs Versus GPUs Versus DNN Accelerators, FPGA accelerators

Main literature: J.L. Hennessy, D.A. Patterson: Computer Architecture: A Quantitative Approach, Morgan Kaufmann.