

Advanced Computer Architectures *Theory*

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Abstract

The course topics are:

- Review of basic computer architecture: the RISC approach and pipelining, the memory hierarchy.
- Basic performance evaluation metrics of computer architectures.
- Techniques for performance optimization: processor and memory.
- Instruction level parallelism: static and dynamic scheduling; superscalar architectures: principles and problems; VLIW (Very Long Instruction Word) architectures, examples of architecture families.
- Thread-level parallelism.
- Multiprocessors and multicore systems: taxonomy, topologies, communication management, memory management, cache coherency protocols, example of architectures.
- Stream processors and vector processors; Graphic Processors, GP-GPUs, heterogeneous architectures.

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