CS-208 **Computer architecture**

Stojilovic Mirjana

Cursus	Sem.	Type
Communication systems	BA3	Obl.
Computer engineering minor	H	Opt.
Computer science minor	H	Obl.
Computer science	BA3	Obl.
HES - IN	H	Obl.

Language of teaching	English
Credits	4
Session	Winter
Semester	Fall
Exam	During the semester
Workload	120h
Weeks	14
Hours	**4 weekly**
Courses	2 weekly
TP	2 weekly
Number of positions	

Summary

The course introduces the students to the basic notions of computer architecture and, in particular, to the choices of the Instruction Set Architecture and to the memory hierarchy of modern systems.

Content

• Complex digital systems in VHDL.
• Basic components of a computer.
• Instruction Set Architectures.
• Assembly-level programming.
• Multi-cycle implementation of processors.
• Caches.
• Virtual memory.

Keywords

Computer Architecture, Basic Processor Architecture,
Instructions Sets, Cache Hierarchies, Virtual Memory.

Learning Prerequisites

Required courses

• Conception de systèmes numériques

Learning Outcomes

By the end of the course, the student must be able to:

• Design and implement a processor at the Register Transfert Level using logic synthesizers and simulators.
• Develop assembly language programs.
• Justify the organization of a modern memory system including cache hierarchies and virtual memory..
• Design and implement a cache memory.

Teaching methods

Courses and labs on a dedicated FPGA board.

Assessment methods

Midterm exam and final exam.

Resources

Bibliography

David A. Patterson and John L. Hennessy, Computer Organization and Design: The Hardware/Software Interface, Morgan Kauffman, 5th edition, 2013.

Ressources en bibliothèque

- Computer Organization and Design: The Hardware-Software Interface / Patterson

Prerequisite for

- Architecture des systems-on-chip.