

CS-307

Introduction to multiprocessor architecture

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Cursus	Sem.	Type
Communication systems	BA5	Opt.
Computer science	BA5	Obl.

Language of teaching	English
Credits	3
Session	Winter
Semester	Fall
Exam	During the semester
Workload	90h
Weeks	14
Hours	3 weekly
Courses	2 weekly
Project	1 weekly
Number of positions	

Summary

This course builds upon the important pre-requisites (computer architecture, system-on-chip and concurrency) to provide the students with the foundations of multiprocessor architecture, which are the building blocks in all modern digital platforms from embedded systems to supercomputers.

Content

- Multiprocessors, multi/manycores
- Cache coherence
- Memory consistency
- Synchronization hardware
- Interconnection networks
- Multicore cache hierarchies

Keywords

Multiprocessors, multicores, manycores, cache coherence, memory consistency models, memory ordering, manycore cache hierarchies, interconnection networks, synchronization

Learning Prerequisites**Required courses**

CS-206 Parallelism & concurrency
CS-208 Computer architecture / Architecture des Ordinateurs

Learning Outcomes

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

- Design and evaluate a snoopy cache-coherent multicore processor
- Design and evaluate memory consistency models
- Design architectural support for synchronization
- Design and evaluate on-chip interconnection networks
- Design and evaluate a multi-core/parallel compute

Teaching methods

Lectures, homework and project

Assessment methods

mid-term and final

Supervision

Office hours	Yes
Assistants	Yes

Resources

Websites

- <http://parsa.epfl.ch/courses/cs307/>