

CS-477

Advanced operating systems

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Cursus	Sem.	Type
Computer science minor	H	Opt.
Computer science	MA1, MA3	Opt.
Cyber security minor	H	Opt.
Cybersecurity	MA1, MA3	Opt.
SC master EPFL	MA1, MA3	Opt.

Language of teaching	English
Credits	6
Session	Winter
Semester	Fall
Exam	Written
Workload	180h
Weeks	14
Hours	5 weekly
Courses	2 weekly
Exercises	1 weekly
Lab	2 weekly
Number of positions	

Summary

This course teaches advanced OS system design. Using an extensive hands-on approach, the course focuses on traditional and new concepts proposed in the past two decades in the area of operating systems.

Content

- Concurrent execution
- Memory management using things like virtual memory and memory allocations
- Scalability, such as lock-free data structures
- File systems
- Operating system architecture
- Virtualization
- Security such as data security, integrity, and authentication

Learning Prerequisites**Required courses**

CS-200 Computer architecture

CS-202 Computer systems (or COM-208 Computer networks / CS-323 Introduction to operating systems)

CS-214 Software construction (or CS-210 Functional programming)

CS-300 Data-Intensive Systems (or CS-322 Introduction to database systems)

Important concepts to start the course

This course is a hands-on course that required solid background in operating systems, databases, programming language, and computer architecture.

Learning Outcomes

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

- Identify and manage key components of operating systems
- Choose or critique design choices for OS
- Create and design an OS with practical choices
- Report performance and possible optimizations for applications

Teaching methods

- In-class lectures
- Homework assignments
- Weekly preparatory exercises
- Programming exercise

Expected student activities

- Attend lectures and tutorial sessions
- Complete the homework assignments
- Participate actively in the course
- Complete programming exercises

Assessment methods

- Preparatory exercise 10%
- Labs 40%
- Final exam 50%

Supervision

Office hours	Yes
Assistants	Yes

Resources

Moodle Link

- <https://go.epfl.ch/CS-477>