CS-323

Introduction to operating systems

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Cursus	Sem.	Type
Communication systems	BA5	Opt.
Computer science minor	H	Opt.
Computer science	BA5	Obl.
HES - IN	H	Obl.

Language of teaching	English
Credits	5
Session	Winter
Semester	Fall
Exam	Written
Workload	150h
Weeks	14
Hours	**5 weekly**
Courses	2 weekly
Exercises	1 weekly
TP	2 weekly
Number of positions	

Summary

Introduction to basic concepts of operating systems.

Content

The purpose of this course is to discuss the design of operating systems, and operating systems concepts. Topics we will cover include operating system organization, system programming, networked and distributed systems, and storage systems. Most of the time will be spent on multi-process systems (processes, interprocess communication, and synchronization), memory organization(paging), resource allocation and scheduling, file systems, and I/O.
Core topics:

- Function and general structure of an operating system.
- Process management.
- Memory management.
- File systems.
- Virtualization and virtual machines.
- Security aspects of operating systems

Keywords

Operating systems

Learning Prerequisites

Required courses

CS-206 Parallelisme and concurrency
CS-207 Programmation orientée système
CS-212 Projet programmation système

Learning Outcomes

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

- Manage key components of operating systems
- Interpret virtualization of resources
- Discriminate persistence policies
- Manage concurrency between tasks

- Specify security aspects of operating systems

Teaching methods

Lectures and exercises.

Expected student activities

Attendance at lectures and completing exercises.

Assessment methods

The students are assessed both on their theoretical knowledge about operating systems as well as based on implementing parts of an operating system.

- Theoretical assessments during the semester in the forum of weekly quizzes (10% of the grade)
- Practical assessments through several programming labs during the semester (50% of the grade)
- Theoretical assessments in the form of a final exam in the exam session (40% of the grade).

Supervision

Office hours	Yes
Assistants	Yes
Forum	Yes

Resources

Bibliography

Operating Systems : Three Easy Pieces, R. Arpaci-Dusseau and A. Arpaci-Dusseau (free online book). Slides available on Moodle.

Ressources en bibliothèque

- Operating Systems : Three Easy Pieces / Arpaci-Dusseau

Références suggérées par la bibliothèque

- Operating Systems Concepts / Silberschatz