

FAME	ENSEA	
	Operating Systems	
US Credits : 3	Lecture; Tutorials : 45h	Language : English

Summary

The purpose of this course is to understand and use the basic concepts of operating systems.

Prerequisites

- C programming language

Contents

The basic concepts of operating systems are common to most computer systems, and enable the interfaces between the computer and the programmer. The Linux kernel will be taken as example to analyze common mechanisms. Concepts listed below will be discussed:

- process management, process data structures, scheduling
- memory management, virtual memory
- inter-process communication, signal, shared memory, semaphores, message queues
- Threads, condition variables
- kernel initialization, kernel modules programming

Laboratory project:

- Development of a micro shell: display of output codes and execution times of programs launched, concatenation of commands, redirection of inputs and outputs to files
- Memory allocator: rewrites malloc() and free() functions so that data integrity is checked each time the allocated area is freed.
- Interprocess communications: error-free communication of 3 processes using pipes, signals and shared memories.
- Threads: error-free synchronization between multiple threads.

Organization

- Approximately 1/3 of the time will be used for formal lecturing, the remaining third being in form of tutorials (tutorial and lecture will be intertwined, as the group will be small enough to do it in the same place).
- The final mark will be composed at 1/3 by a written exam, and at 2/3 by the work done in practical work.

Textbook

1. D. P. Bovet, M. Cesati, Understanding the Linux Kernel, O'Reilly Media (October 2000)
2. A.S. Tanenbaum, Modern Operating Systems, Prentice Hall, 3 edition (December 21, 2007)

Similar to the following courses

- IIT Chicago CS 450
- University at Buffalo CSE 421
- University of Pittsburgh CS 1550
- University of Illinois at Urbana-Champaign CS 423
- Mississippi State University CSE 4733
- University of Michigan at AA EECS 300 level
- Michigan Tech