

Computer Microsystems

Teacher in charge: Gilles Carpentier

Pre-requisites: II.1102 / II.1202 Algorithmique et programmation

Organization: 14 lectures

Assessment: 1 final written examination

ECTS: 5 credits

Context

The operating systems are the fundamentals on which electronic, informatics and telecommunications applicative systems live and are deployed. They are the link between the applicative and hardware layers and they provide the essential services upon which efficient applications can be build, maximally exploiting the hardware. It is capital for an operational engineer in charge of the aforementioned applicative systems to have a fundamental knowledge of the operating systems.

Many systems are written in C language , particularly embedded systems.

Goals

The course has two main objectives: learn the basic concepts of operating systems (internal aspects) and system programming: to be able to write an application in C language under Linux that interacts with the OS.

Skills

Concepts

- In which context should we use the C language today ?
- Overall structure of a program, syntax, data types, compiling and linking.
- Operators and expressions
- Instructions, blocks and conditions
- Functions
- Array, structures and unions
- Pointers
- Preprocessor, libraries, modular programming, make
- Multitask system, process and task scheduler
- Memory management
- File system
- Processes and threads
- signaling
- Interprocess communication (IPC) : shared memory, semaphores

Skills

- Design and development of a C program.
- Use of the gcc compiler and make.

Teaching method

A lecture followed by a laboratory session per week.

Bibliography

The C language (Kernighan & Ritchie)

Pratique performante du langage C (Emmanuel Lazard)

Linux man pages