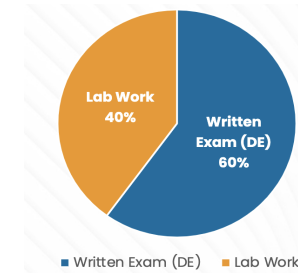


Operating Systems (35h)

Estimated Personal Work : 70h

	Lectures	Practical Works (Linux Command)	Practical Works (Writing Code)
Chapter 1	Introduction and background 2h <ul style="list-style-type: none"> - Role of an operating system and History of UNIX systems - Architecture of Unix systems - The GNU/Linux system - Tasks performed by the Linux kernel - The POSIX standard - Programming in C and the compilation toolchain - Difference between libc and system calls - The shell system (example bash) - The man (how to use the man command) - Command format (cmd -options --option arg1 arg2 ...) - Basic shell commands: man, ls, cd, cp, mv, pwd, cat, wc, less, grep 	2h Basic linux commands: <ul style="list-style-type: none"> - Format of a linux command - Practice the following commands: man, ls, cd, cp, mv, pwd, cat, wc, less, grep, cat, less, file, rm, find 	3h <ul style="list-style-type: none"> - Use a text editor to write C code: example gedit or emacs - Use of gcc for building - int main(int argc, char *argv[]) - perror
Chapter 2	Input/Output 2h <ul style="list-style-type: none"> - File management shell commands and redirects (<, >, &>, ...) - File descriptors - The stdin, stdout and stderr channels - The open system call with its options, parameters, rights ... - Reading the manual of open (man 2 open) - read(), write(), close() system call with its different options, parameters. 	2h <ul style="list-style-type: none"> - Using redirection commands (>>> <2> &>) - Commands: file, cat, ls 	3h System call : <ul style="list-style-type: none"> - open(O_RDONLY, ORDWR...), read, write, close
Chapter 3	File system organisation 2h <ul style="list-style-type: none"> - Tree structure of the linux file system - Organization of the hard disk - Organisation diagram of a UNIX partition - /dev file system - partitions and storage devices (/dev/sda...) and the fdisk tool - inodes - File types (block, character, symbolic link, ...) - Access rights (ls -l, chmod, chown...) - lseek, dup, dup2 system call - /proc file system 	2h <ul style="list-style-type: none"> - ls -l and rights - chmod - chown 	3h <ul style="list-style-type: none"> - lseek() - dup - dup2
Chapter 4	Concept of process 2h <ul style="list-style-type: none"> - Definition of a process (pid, ppid, ...) - process manipulation commands : top, ps, bg, fg, jobs... - Process tree (init ...) - priority : user mode / kernel mode - /proc file system - getpid(), getppid(), getpgrp(), setpgrp() system calls - getuid(), geteuid() system calls - Scheduling (R, T, S, D, Z...) - fork() system call - wait(), waitpid()... system call - exec(), execl(), execv(), execve() system call 	2h Practice on commands : top, ps, bg, fg, jobs, top, htop <ul style="list-style-type: none"> - show /proc filesystem 	3h <ul style="list-style-type: none"> - fork() system call - wait(), waitpid()... system call - exec(), execl(), execv(), execve() system call
Chapter 5	Signals 2h <ul style="list-style-type: none"> - Introduction to the communication between processes - Signals (kill -l) and their different roles - kill() and trap() bash commands - signal() system call, and raise() function of libc - Signal redirection with the sigaction() system call 	2h Practice on commands : kill -l, kill trap	3h <ul style="list-style-type: none"> - kill, signal and sigaction system call



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