Introduction to Linux and Supercomputers

MA030366 (Term 2: 27/10 - 17/12)
R2-B5-2026
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Course Contents

- Programming in the Linux environment
  - using a cluster of high-performance nodes connected by high-speed network (Zhores)

- Mandatory books:
  - ANDREW S. TANENBAUM, HERBERT BOS, MODERN OPERATING SYSTEMS, 4th Edition,
    - https://csc-knu.github.io/sys-prog/books/Andrew%20S.%20Tanenbaum%20-%20Modern%20Operating%20Systems.pdf
  - Kernighan B. W., Ritchie D. M. The C programming language. – 2006.
    - http://cslabcms.nju.edu.cn/problem_solving/images/c/cc/The_C_Programming_Language_%282nd_Edition_Ritchie_Kernighan%29.pdf

Linux & Supercomputers course goals

- At the end of the course, you should be able to
  - Understand the Linux environment, navigate around, program in C and find information to master Linux — L1
  - Apply useful Linux commands, write automated scripts and use facilities on the Zhores Supercomputer (Batch, Docker) — L2
  - Organize files for a programming project, including the automated compilation and software versioning system — L3
  - Create communicating programs using client-server model — L4
  - Create parallel programs with shared and distributed memory paradigms using symmetric multiprocessing — L4
  - Analyze performance of programs — L5

L&S Course Schedule (Preliminary)

12.30 – 15.30 Room R2-B5-2026

Date	Subject	Date	Subject
27/10	Linux OS, C programming	29/10	Linux OS, C programming HW-1 assignment – due 12/11
1st week of November no L&S Course, HomeWork!			
10/11	Linux OS, C programming Q&A for Linux OS	12/11	Linux OS, C programming Q&A for Linux OS
17/11	Using ZHORES & facilities Workload schedulers Review of HW-1 (from 12/11)	19/11	Virtualization Q&A for Linux OS and HW HW-2 assignment – due 03/12
24/11	Compiler, Software Organization C and Fortran Programing, debugger Performance analysis	26/11	Parallel programming with OpenMP and MPI
01/12	Parallel programming with OpenMP and MPI	03/12	GPU, CUDA, OpenCL HW-3 assignment – due 10/12
08/12	Network, Client/Server model X-Windows environment Review of HW-2 (from 03/12)	10/12	AOB Labs
15/12	Review of HW-3 (from 10/12)	17/12	Course presentations, Q@A

Linux & Supercomputers is Graded

activity	Approximate weight	Comment
Class participation	25%	Activities during the lecture hours Start writing C programs needed to qualify (finish at home later)
Computer Labs	25%	
Homework assignment	25%	Additional watching, reading and **essay**; Computer activities similar to Lab work *Not doing HA disqualifies from grading*
Team Project	15%	Select subject for a project Work in groups of 2-3 people
Test/Quiz	10%	Surprise questions during lectures or Q&A sessions
	100%	

our essay consists of 4 parts

≥1 page pt.11 English text

- Part 1: [level 1 pass]
  - Write a concise summary of the article (video) or a description of what you intend to do in the assignment
    - Success if the terms/concepts are used correctly
- Part 2: [Level 2 pass]
  - Set the issue (article/video) into the relevant context
    - Success if you articulate clearly why the issue is important
- Part 3: [Level 3 pass]
  - Relate the subject (issue you selected) to your own plans
    - Success if you can present your choices in an informed manner
- Part 4: [Level 4 pass]
  - Sharpen the criticality of the issue and propose a solution
    - Success if your proposal does not contradict laws of physics

We need your essay to make sure you actively use the terms introduced in the lectures & reading books in the appropriate context