Unix System Administration

1. **Course number and name:** 020ADUES3/020USAES2 Unix System Administration

2. **Credits and contact hours:** 4 ECTS credits, 2x1:15 contact hours

3. **Name of course coordinators:** Chantal Hajjar, Khalil Hariss

4. **Instructional materials:** lab experiments; slides; in-class problems

5. **Specific course information**
   a. **Catalog description:**
      This course provides a comprehensive introduction to Unix and Linux operating systems, emphasizing practical skills and foundational concepts. Students will explore the Linux command-line interface, essential file system navigation, and disk management techniques. Key topics include text editing with tools like vi and nano, writing basic shell scripts for task automation, and performing core system administration tasks. The course also covers process and system monitoring, as well as essential networking and security principles. By the end, students will be equipped with the skills needed to confidently operate and manage Unix/Linux environments in both academic and professional settings.

   b. **Prerequisites:** None

   c. **Required** for CCE students

6. **Educational objectives for the course**
   a. **Specific outcomes of instruction:**
      - Navigate the Unix/Linux file system and manage files and directories using command-line tools.
      - Understand and apply file system concepts, including permissions, ownership, and disk usage management.
      - Edit and manipulate text files using command-line text editors such as vi, vim, or nano.
      - Write and execute basic shell scripts to automate system tasks and workflows.
      - Perform essential system administration functions, including user and group management, package installation, and system updates.
      - Monitor and manage system processes, CPU usage, memory, and logs using Linux monitoring tools.
      - Configure basic networking settings and understand key network diagnostic tools.
      - Apply fundamental security practices, including setting permissions, managing firewalls, and understanding user authentication mechanisms.

   b. **PI addressed by the course:**

PI	1.1	1.2	1.3	2.3	7.1
Covered	x	x	x	x	x
Assessed		x	x		

7. Topics and approximate lecture hours

- Introduction to UNIX and Linux Operating Systems (1 lecture)
- Installing Linux and Getting Started with the Command Line (2 lectures)
- Navigating the File System and Managing Files and Directories (2 lectures)
- Understanding File Permissions and Ownership (2 lectures)
- Text Editing with nano, vi, and vim (1 lecture)
- Text Manipulation with sed, cut, and awk (1 lecture)
- Shell Scripting: Variables, Conditionals, and Loops (3 lectures)
- Automating Tasks and Writing Reusable Scripts (1 lecture)
- User and Group Management (2 lectures)
- Process Management and Job Control (2 lectures)
- System Monitoring and Log Analysis (2 lectures)
- Disk and File System Management (2 lectures)
- Basic Networking Concepts and Configuration (3 lectures)
- Introduction to Linux Security: Firewalls, Authentication, and Updates (2 lectures)
- Lab 1: File Management, Permissions, and Text Editing (2 sessions)
- Lab 2: Shell Scripting, User Management, Networking and Security (2 sessions)