MARYLAND APPLIED
GRADUATE ENGINEERING

Linux System Administration (ENPM818P) - Tentative Syllabus

Term: *Fall 2024*

Professor: Bertrand Sobesto   **Teaching Assistant:** ###

Pronouns: ###   **Pronouns:** ###

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Office Hours: TBD

Credits: 3

Course Dates: From August 26 - December 9 2024

Course Times: Monday 7:00-9:40PM

Classroom: JMP 2217

Canvas/ELMS: ###

Course Description

ENPM818P will provide an hand-ons experience with the installation, configuration and administration of Linux operating systems. Linux topics will include operating system architecture and components, task scheduling, memory and process management, device drivers, partitioning and file systems, boot processes, command line, customizing the environment, shell scripting, networking, and securing the system. The hands-on portion of the class will be an opportunity for the students to create and manage virtual machines, install Linux in virtual machines, work with the command line and various Linux tools to customize, administer and secure linux-based systems. The lab sessions will also cover launching Linux cloud instances as well. To summarize, students will acquire the technical knowledge to install, customize, manage and secure a system running a Linux Operating System.

Prerequisites

There are no official course prerequisites for this class.

Learning Outcomes

After successfully completing this course you will be able to:

- Understand the architecture and the philosophy of the Linux Operating System
- Install and secure a Linux-based system in a virtual machine and in the Cloud
- Navigate a Linux-based file system and use the command line interface with confidence
- Perform the daily Linux Operating system administration tasks
- Manage hardware, software and user access of a Linux-based system

Course Materials

Required Resources

- Since ENPM818P is an hands-on class, the students will need a computer running the operating system of their choice and will need to have a copy of VMWare Workstation or Fusion (available free from https://terpware.umd.edu). Students will create and be provided with virtual machine images that will be used for class exercises, homework assignments, the midterm project, and the final project. Students who are attending class in person should bring a laptop so they can perform the exercises during class.

Grading

Grade Breakdown

Assignment	Percentage %
6 Real-World Application homework assignments	60%
Mid-Term Exam	15%
Final Exam	25%
Total	100%

Course Schedule

Week #	Topic
1	**Introduction to Operating Systems, UNIX and Linux Philosophy and structure.** Basic Linux OS Installation and First Login
2	**Linux Fundamentals** Shells, Basic Commands and text editors
3	**Advanced Linux Command Line** Redirections, utilities and advanced commands
4	**File System Structure** Directory structure, Permissions and ACLs
5	**Cloud Installation** Launch Linux Based instances in AWS (maybe Azure? GPC?)
6	**Account Management** User and Groups management, authentication and access security
7	**Job and Process Management** Process Execution (foreground, background) , Priority, virtual screen and session multiplexers.
8	**Shell Scripting** Scripting for Linux OS administration
9	**Network Management** IP Network configuration, Firewalling
10	**Disk Management** Advanced Partitioning, LVMs, Disk encryption
11	**Services**

		Common Linux Services, *systemd* and services management (start/stop).
	12	**Software Management** Software Package Management vs. Source code compilation
	13	**Configuration Automation & Management** Tools to automate configuration at large scale
	14	**Monitoring and Log Management** Tools to monitor and collect logs on Linux Operating Systems
	15	**Linux GUI** Graphical Login Manager, Overview of common Graphic Desktops Environments

Note: This is a tentative schedule, and subject to change as necessary – monitor ELMS-Canvas for current deadlines. In the unlikely event of a prolonged university closing, or an extended absence from the university, adjustments to the course schedule, deadlines, and assignments will be made based on the duration of the closing and the specific dates missed.