

## **NOS 220 LINUX/UNIX ADMIN I**

### **COURSE DESCRIPTION:**

Prerequisites: NOS 120

Corequisites: None

This course introduces the Linux file system, group administration, and system hardware controls. Topics include installation, creation and maintaining file systems, NIS client and DHCP client configuration, NFS, SMB/Samba, Configure X, Gnome, KDE, basic memory, processes, and security. Upon completion, students should be able to perform system administration tasks including installation, configuring and attaching a new Linux workstation to an existing network. Course Hours Per Week: Class, 2. Lab, 2. Semester Hours Credit, 3.

### **LEARNING OUTCOMES:**

Upon completion of this course, students will be able to:

- a. Install Linux server and desktop for physical or virtual environments
- b. Manage system boot and initialization
- c. Administer active processes and system services
- d. Create and manage file systems and storage
- e. Configure networking
- f. Manage hardware devices
- g. Configure remote access
- h. Monitor a system
- i. Automate tasks
- j. Manage backup and recovery
- k. Administer user access and security

### **OUTLINE OF INSTRUCTION:**

- I. Linux system installation
  - a. Physical installation with DVD media or network install
  - b. Virtual installation with ISO image
  - c. Desktop vs. server components
- II. System initialization
  - a. BIOS and poweron
  - b. Kernel, init, and initramfs
  - c. GRUB, lilo, syslinux, and boot management
  - d. Runlevels, runlevel directories, and service initialization

- III. Administer Linux processes and services
  - a. Processes and jobs
  - b. Foreground, background, and daemon processes
  - c. Prioritization
  - d. Stopping and killing processes
- IV. Administer Linux file system
  - a. File system capabilities and comparisons
  - b. Journaling
  - c. Partition naming conventions
  - d. Creating and managing partitions with GUI and command line
  - e. Creating and managing file systems with GUI and command line
  - f. Configuring LVM and software RAID
  - g. Setup and manage disk quotas
- V. Network configuration
  - a. IP basics and required configurations (IP, netmask, router, dns)
  - b. Viewing IP configuration with command line and GUI tools
  - c. Configuring interfaces with command line and GUI tools
  - d. Testing network configurations and troubleshooting tools
- VI. Manage hardware
  - a. Device drivers – kernel and kernel modules
  - b. sysfs and udev
- VII. Configure remote access
  - a. Command line using SSH
  - b. GUI using VNC or RDP
- VIII. Monitor Linux
  - a. Gathering hardware information
  - b. Monitoring disk space utilization
  - c. System logging with syslog and logrotate
  - d. Login tracking
  - e. Automating tasks with cron and at
- IX. Backup and Recovery
  - a. Strategies, methods, media, and schedules
  - b. tar, including gz and bzip2 compression
  - c. dd and drive images
  - d. Mirroring with rsync

- X. User access and systems security
  - a. PAM and modules
  - b. sudo and appropriate root usage
  - c. ACLs and permissions
  - d. Firewalls and packet filtering

### **REQUIRED TEXTBOOK AND MATERIALS:**

Text to be assigned by the instructor each semester.

### **STATEMENT FOR STUDENTS WITH DISABILITIES:**

Students who require academic accommodations due to any physical, psychological, or learning disability are encouraged to request assistance from a disability services counselor within the first two weeks of class. Likewise, students who potentially require emergency medical attention due to any chronic health condition are encouraged to disclose this information to a disability services counselor within the first two weeks of class. Counselors can be contacted by calling 919-536-7207, ext. 1413 or by visiting the Student Development Office in the Phail Wynn Jr. Student Services Center, room 1209.