Las Positas College
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Course Outline for CS 41

INTRO TO LINUX/LPI LINUX+ CERTIFICATION

Effective: Spring 2018

I. CATALOG DESCRIPTION:
CS 41 — INTRO TO LINUX/LPI LINUX+ CERTIFICATION — 3.00 units

This course provides hands-on training covering basic installation, management, configuration, documentation and hardware topics for the Linux/UNIX operating system on workstations in a network environment. The course includes comprehensive coverage of topics related to Linux distributions, installation, administration, X-Windows, and networking. Students who have completed or are enrolled in Computer Networking Technology 7401 may not receive credit.

2.50 Units Lecture 0.50 Units Lab

Strongly Recommended
CNT 50 - Introduction to Desktop Operating Systems
with a minimum grade of C

Grading Methods:
Letter or P/NP

Discipline:
- Computer Science or
- Computer Service Technology

	MIN
Lecture Hours:	45.00
Lab Hours:	27.00
Total Hours:	72.00

II. NUMBER OF TIMES COURSE MAY BE TAKEN FOR CREDIT: 1

III. PREREQUISITE AND/OR ADVISORY SKILLS:

Before entering this course, it is strongly recommended that the student should be able to:

A. CNT50
1. identify the operating system's functions, structures, and major system files and to explain the function of each;
2. compare the features of various operating system;
3. identify basic concepts and procedures for creating, viewing, and managing files, and folders for different operating systems;
4. use and explain command prompt functions on different operating systems;
5. perform disk maintenance operations such as backup, restore, defragment, scan disk;
6. install/upgrade Windows and Linux operating system;

IV. MEASURABLE OBJECTIVES:

Upon completion of this course, the student should be able to:

A. Outline the key features, advantages and uses of the Linux/UNIX operating system
B. Install and configure a basic desktop Linux/UNIX OS
C. Identify the default permissions created on files and directories, and apply special file and directory permissions
D. Use basic shell programming, perform text manipulations, and use Linux/UNIX programming tools.
E. Describe common types of CPU's, memory, disk drives, system boards, and peripheral devices
F. outline the major steps necessary to configure boot loaders, dual booting, the init daemon and runlevels
G. Install and use X Windows, window managers, and desktop environments
H. Configure system and network settings
I. Configure TCP-IP for Linux/UNIX/UNIX on LANs
J. Describe and evaluate file sharing options

V. CONTENT:
A. Using Linux
1. The Shell
2. Linux Help
3. Text Editors
4. Aliases
5. Environment Variables

6. Shell Configuration Files
7. Redirection Files
8. Directories
9. Files
10. Links
11. Filesystem Hierarchy Standard (FHS)
12. Locating and Searching Files

B. Installation and Localization
1. Linux System Design
2. Linux Installation
3. Localization

C. Boot and Shutdown
1. Linux Boot Process
2. Bootloaders
3. Systemd
4. System Services
5. System Shutdown

D. User Interfaces and Desktops
1. X Window System
2. Display Managers
3. Accessibility

E. Software Installation
1. Package Managers
2. Alternate IP Addressing
3. DHCP Server Configuration
4. Shared Libraries

F. Users and Groups
1. User and Group Overview
2. User Management
3. Group Management

G. Disk and File System Management
1. MBR Disk Partitions
2. GUID Partitions
3. Logical Volume Manager
4. File Systems
5. Mounting File Systems
6. File System Maintenance
7. Disk Quotas
8. Ownership
9. Permissions
10. Special Permissions
11. Archive and Backup

H. Hardware Installation
1. Device Drivers
2. Kernel Module Management
3. Hotplug and Coldplug Devices

I. Processes and System Services
1. Processes
2. Process Management
3. Task Management
4. Print Management
5. System Time Configuration
6. Mail Transfer Agent (MTA)
7. Structured Query Language (SQL)

J. System Monitoring
1. System Logging
2. Scripting
3. Text Stream Processing

K. Networking
1. IPv4 Overview
2. Network Interface Configuration
3. IPv6 Overview
4. Routing Configuration
5. Hostname and DNS Configuration
6. Network Troubleshooting

L. Security
1. Root Usage
2. User Security and Restriction
3. Login Blocking
4. Network Security
5. xinetd Super Daemon
6. OpenSSH
7. SSH Port Tunneling
8. Public Key Authentication
9. Gnu Privacy Guard

VI. METHODS OF INSTRUCTION:
A. **Lecture** -
B. **Demonstration** -
C. **Research** -
D. **Lab** -
E. **Discussion** -

VII. TYPICAL ASSIGNMENTS:
A. Watch a video prentation on X Windows configuration; post comments and questions as you try to perform the steps yourself.
B. Find text resources describing DOS attacks, select 3 to read and summarize.
C. Complete an online exercise and/or assessment on updates and network configuration
D. Analyze an example Linux system for security flaws; write a report describing your findings and suggesting mitigation strategies.

VIII. EVALUATION:

A. **Methods**

1. Exams/Tests
2. Quizzes
3. Class Participation
4. Home Work
5. Lab Activities

B. **Frequency**

1. Exams/Tests - one midterm exam and one final exam
2. Quizzes - weekly
3. Class participation - weekly
4. Homework - weekly
5. Lab Activities - weekly

IX. TYPICAL TEXTS:

1. Breshnahan, Christine. *CompTIA Linux+ Powered by Linux Professional Institute Study Guide.* 3rd ed., Wiley/Sybex, 2015.
2. Brunson, Ross. *CompTIA Linux+ / LPIC-1 Cert Guide.* 1st ed., Pearson, 2015.
3. Batista, Alfred. *Linux Operations and Administration.* 1st ed., Cengage, 2015.
4. Association of Computing Machinery ACM.org student membership
5. TestOut.com Online Computer-Based Training Student Subscription

X. OTHER MATERIALS REQUIRED OF STUDENTS:

A. Students require access to a computer connected to the Internet, with word processing and browser software, and an email address.