

Lecture Contact Hours: 32-36; Homework Hours: 64-72; Total Student Learning Hours: 96-108
Laboratory Contact Hours: 48-54; Homework Hours: 0; Total Student Learning Hours: 48-54

CUYAMACA COLLEGE
COURSE OUTLINE OF RECORD

COMPUTER AND INFORMATION SCIENCE 291 – LINUX SYSTEM ADMINISTRATION

2 hours lecture, 3 hours laboratory, 3 units

Catalog Description

Comprehensive hands-on application and instruction in multi-user, multi-tasking operating systems and networked operating systems. Topics include: operating system installation and configuration, storage configuration and management, server security configuration, user and group management, configuration and management of various server roles (such as LDAP, DNS, DHCP, Print, Mail, Samba, Apache), troubleshooting, and disaster recovery. Course maps to the Linux Professional Institute (LPI) Certification Level 4.5 exam and the Red Hat Systems Administrator certification.

Prerequisite

“C” grade or higher or “Pass” in CIS 191 or equivalent

Entrance Skills

Without the following skills, competencies and/or knowledge, students entering this course will be highly unlikely to succeed:

- 1) Working knowledge of advanced Linux operating system terminology (i.e., permissions, run-levels, vi, processes, etc.) and advanced computer network terminology (i.e., domain, sub-netting, DNS, DHCP, NAT, etc.).
- 2) Working knowledge of Linux command line interpreter command syntax.
- 3) Complete complex computer client setup and configuration procedures without supervision.

Course Content

- 1) Linux server operating system configuration using command line tools
- 2) Configuration of network server roles (DNS, DHCP, Print, LDAP, Samba, Apache, etc.)
- 3) Computer utility programs pertinent to network server configuration and management
- 4) Storage system management, including quotas, fault-tolerant storage configurations, permissions, security and recovery
- 5) Software installation, update, configuration and management
- 6) Sharing files and folders across a network
- 7) Server security concepts, configuration and management, including authentication, access control lists, and log monitoring and management
- 8) Server and server role backup

Course Objectives

Given a computer troubleshooting or configuration scenario, students will be able to:

- 1) Define, describe and/or discuss:
 - a. Server and network operating system functions, roles and properties.
 - b. Server management tools and utilities.
 - c. Server directory services.
 - d. Network hardware and printer resources.
 - e. Server security considerations and utilities.
 - f. Major elements of the Linux server operating system architecture.
- 2) Configure, manage and troubleshoot network configuration, protocols, routing tables and remote access.

- 3) Configure, manage and troubleshoot server network roles, DNS, DHCP, print server, web server, file server (Samba), mail server and FTP server.
- 4) Configure, manage and troubleshoot network file systems, partitions, logical volumes, compression, disk errors, disk configurations RAID, disk mount points, and user disk quotas.
- 5) Configure, compile and install custom kernel modules and software packages.
- 6) Monitor and troubleshoot server/network performance using pertinent utilities.
- 7) Backup and recover data, server roles and system configuration using backup utilities.

Method of Evaluation

A grading system will be established by the instructor and implemented uniformly. Grades will be based on demonstrated proficiency in subject matter determined by multiple measurements for evaluation, one of which must be essay exams, skills demonstration or, where appropriate, the symbol system.

- 1) Written quizzes and exams that measure students' ability to describe computer operating system functions and characteristics, and analyze a scenario and choose the alternatives and troubleshooting options.
- 2) Scenario-based lab activities that measure students' ability to configure specific operating system functions or subsystems, troubleshoot/analyze imposed system problems, investigate potential alternatives, and implement corrective action to achieve a determined result.
- 3) Practical application-based examinations that measure students' ability to evaluate scenario-based computer configuration requirements/problems, analyze/troubleshoot the operating system configuration, and apply the correct configuration changes to achieve the correct results.

Special Materials Required of Student

Electronic storage media

Minimum Instructional Facilities

- 1) Current version of Linux server operating system
- 2) Computer lab with configurable hard drives installed with appropriate software, or a virtualized lab environment using either VMWare or Virtual PC/Server software that is accessible via the campus network or the Internet
- 3) Instructional domain server capable of student client computer connection (real or virtual)
- 4) Course management system

Method of Instruction

- 1) Lecture and demonstration
- 2) Hands-on practice
- 3) Topical discussion of current operating system trends and issues

Out-of-Class Assignments

May include the following:

- 1) Reading assignments
- 2) Virtualized labs
- 3) Tests and quizzes
- 4) Discussion item research and responses

Texts and References

- 1) Required (representative example): Bresnahan, Christine. *LPIC-2 Linux Professional Institute Certification Study Guide: Exams 201 and 202*. Second Edition, Sybex, 2019, ISBN 10: 1119150795, ISBN 13: 978-1119150794.
- 2) Supplemental: None

Exit Skills

Students having successfully completed this course exit with the following skills, competencies and/or knowledge:

- 1) Ability to configure, manage and troubleshoot server networking issues.
- 2) Ability to configure, manage and troubleshoot server access and authentication issues.
- 3) Ability to configure, manage and troubleshoot drive partitions.
- 4) Ability to configure, manage and troubleshoot server security.

Student Learning Outcomes

Upon successful completion of this course and given a computer troubleshooting or configuration scenario, students will be able to:

- 1) Install, deploy, configure and manage a datacenter virtualization project using current industry software and standards.