Montgomery County Community College
CIS 142
Linux Administration
3-2-2

COURSE DESCRIPTION:
This course provides extended knowledge of the Linux Operating System. Advanced features and benefits of these operating systems including system administration, networking, configuration, communications, and control will be studied. Students will participate in complex laboratory assignments. The objectives of this course will align with a major industry certification exam.

REQUISITES:
Previous Course Requirements
- CIS 141 Introduction to the UNIX/Linux Operating System

Concurrent Course Requirements
None

LEARNING OUTCOMES Upon successful completion of this course, the student will be able to:	LEARNING ACTIVITIES	EVALUATION METHODS

1.Demonstrate the installation, configuration, and operation of commonly used Linux features and services such as:
- Kernel
- Printing services
  - File sharing
  - Security related sub-systems and services
  - Web servers
  - Networking services
  - Remote access services
  - Windowing (GUI) Services.
	Assigned Readings
	Lecture
	Discussion
	Hands-On Lab Exercises
	Homework Assignments
	Group Projects
	Quizzes
	Exams
		Tests or Quizzes
		Projects
		Final Project
		Competency Checklist

LEARNING OUTCOMES	LEARNING ACTIVITIES	EVALUATION METHODS
2. Describe the architecture, run-time configuration, and use of Linux in an active working environment.	Assigned Readings Lecture Discussion Hands-On Lab Exercises Homework Assignments Group Projects Quizzes Exams	Tests or Quizzes
3. Demonstrate the ability to write basic shell scripts, modify start-up scripts, and automate system maintenance tasks via scripting.	Assigned Readings Lecture Discussion Hands-On Lab Exercises Homework Assignments Group Projects Quizzes Exams	Tests or Quizzes Final Project
4. Demonstrate standard industry practices for maintaining secure and highly productive Linux systems with a focus on: - User and group account configuration and management - Firewall configuration and management. - SSH Installation and Utilization - Network services fortification. - Remote access configuration and management. - High security Linux distributions.	Assigned Readings Lecture Discussion Hands-On Lab Exercises Homework Assignments Group Projects Quizzes Exams	Tests or Quizzes Projects Final Project Competency Checklist

At the conclusion of each semester/session, assessment of the learning outcomes will be completed by course faculty using the listed evaluation method(s). Aggregated results will be submitted to the Associate Vice President of Academic Affairs. The benchmark for each learning outcome is that *70% of students will meet or exceed outcome criteria*.

SEQUENCE OF TOPICS:
1. Explain and Demonstrate Management of the Linux Kernel
   a. Manage/Query kernel and kernel modules at runtime
   b. Reconfigure, build, and install a custom kernel and kernel modules
2. Demonstrate a Mastering of Booting, Initialization, Shutdown and Runlevels in a Linux Environment
   a. Boot the system
   b. Change runlevels and shutdown or reboot system
3. Explain and Demonstrate the Set-Up and Management of Printing Services in a Linux Environment
   a. Manage printers and print queues
   b. Print files
   c. Install and configure local and remote printers
4. Demonstrate a Mastery of the Usage of Linux Documentation
   a. Use and manage local system documentation
   b. Find Linux documentation on the Internet
   c. Notify users on system-related issues
5. Explain and Demonstrate the Proper Use of Shells, Scripting, Programming and Compiling in a Linux Environment
   a. Customize and use the shell environment
   b. Customize or write simple scripts
6. Demonstrate Mastery of the Following Administrative Tasks:
   a. Manage users and group accounts and related system files
   b. Tune the user environment and system environment variables
   c. Configure and use system log files to meet administrative and security needs
   d. Automate system administration tasks by scheduling jobs to run in the future
   e. Maintain an effective data backup strategy
   f. Maintain system time
7. Explain Networking Fundamentals in a Network that Includes Linux
   a. Fundamentals of TCP/IP
   b. TCP/IP configuration and troubleshooting
   c. Configure Linux as a PPP client
8. Demonstrate the Appropriate Configuration/Operation of the Following Linux Networking Services:
   a. Configure and manage inetd, xinetd, and related services
   b. Operate and perform basic configuration of sendmail or similar service
   c. Operate and perform basic configuration of Apache or similar service
   d. Properly manage the NFS, smb, and nmb daemons or similar services
   e. Setup and configure basic DNS services
   f. Set up secure shell (OpenSSH)
9. Explain and Demonstrate Security Techniques for Securing a Linux Environment
   a. Perform security administration tasks
   b. Setup host security
   c. Setup user level security

LEARNING MATERIALS:

Shotts, William E. Jr. (2019). The Linux Command Line (5th Internet Edition, Version 19.01A). No Starch Press. (available for free from http://linuxcommand.org/tlcl.php)

Smith, R.W. (2015). *LPIC-1: Linux Professional Institute Certification Study Guide* (Exams 101 and 102). 4TH Edition, Sybex.   ISBN: 9781119021186

Other learning materials may be required and made available directly to the student and/or via the College's Libraries and/or course management system.

COURSE APPROVAL:
Prepared by: Lee Bender   Date: 3/2000
Revised by: Jason Wertz   Date: 2/2006
Revised by: K. Murphy   Date: 4/2009
VPAA/Provost Compliance Verification: Dr. John C. Flynn, Jr.   Date: 9/11/2009

Revised by: Jason Wertz   Date: 7/23/2013
VPAA/Provost or designee Compliance Verification:
          Victoria Bastecki-Perez, Ed.D.   Date: 7/26/2013

Revised by: Pat Rahmlow   Date: 1/11/2018
VPAA/Provost or designee Compliance Verification:
          Victoria L. Bastecki-Perez, Ed.D.   Date: 1/30/2018

Revised by: Jason Wertz and Marie Hartlein   Date: 10/2/2019
VPAA/Provost or designee Compliance Verification: Date: 2/12/2020

This course is consistent with Montgomery County Community College's mission. It was developed, approved and will be delivered in full compliance with the policies and procedures established by the College.