



CSCI 25 - Linux 1

Catalog Description

Transfer Status: CSU
Unit(s): 3.00
Lecture: 34.00 Contact hours/68.00 Out of class hours/102.00 Total hours/2.00 Unit(s)
Lab: 51.00 Contact hours/0.00 Out of class hours/51.00 Total hours/1.00 Unit(s)
Total: 85.00 Contact hours/68.00 Out of class hours/153.00 Total hours/3.00 Unit(s)

Course Description: In this course students learn the fundamental concepts of the Linux operating system and the basic skills needed to work productively on a Linux system. Topics covered include installation, basic configuration, and package management, fundamental command-line tools, text editing with the vi (visual editor), the File Hierarchy Standard (FHS), processes, and permissions. Students will configure, script, and work exclusively in a shell (text-based, command-line) environment. This course prepares students for the globally recognized LPIC1-101 Certification test.

Objectives

- Upon successful completion of this course, the student should be able to:
- 1. Install and configure Linux by designing a hard disk layout, installing a boot manager, managing shared libraries, and installing Linux as a virtualization guest.
 - 2. Monitor and control processes and modify execution priorities on a Linux system.
 - 3. Demonstrate an understanding of system architecture by determining and configuring hardware settings, booting the system, changing runlevels/boot targets, and shutdown or reboot system.
 - 4. Manage packages and updates by using Debian, RPM, and YUM package management.
 - 5. Select and use GNU and Linux commands by processing text streams using filters (e.g., cat, head, tail, sort, uniq, grep, sed), pipes and redirects, manage, edit, and search files using regular expressions.
 - 6. Demonstrate device, Linux filesystem, and FHS mastery by creating and maintaining the integrity of partitions and filesystems, mounting and unmounting filesystems, managing file ownership and permissions, file placement and removal and creating and changing hard and symbolic links.

Course Content

Topic Titles / Suggested Time Topic	
<u>Lecture</u>	
<u>Topics</u>	<u>Lec Hrs</u>
Linux and the open source community	1.00
System installation, basic configuration and package management.	3.00
FHS	1.00
Working with files and directories	2.00
File and directory permissions	2.00
Editing with the vi	6.00
Manual (man) pages and info	1.00
Streams, pipes, and redirection	2.00
Text filters	4.00
Regular expressions, grep, sed, and awk	2.00
Monitoring and controlling processes	2.00
Basic features of a shell	2.00
Configuring a shell environment	2.00
Basic shell scripting	4.00
Total Hours: 34.00	
<u>Lab</u>	
<u>Topics</u>	<u>Lab Hrs</u>
System installation, basic configuration and package management	6.00
Working with files and directories	4.50
File and directory permissions	3.00
Total Hours: 51.00	

Topics	Lab Hrs
Editing with the vi	9.00
Manual (man) pages and info	1.50
Streams, pipes, and redirection	3.00
Text filters	6.00
Regular expressions, grep, sed, and awk	3.00
Monitoring and controlling processes	3.00
Basic features of a shell	3.00
Configuring a shell environment	3.00
Basic shell scripting	6.00
Total Hours:	51.00

Methods of Instruction

- A. Demonstrations
- B. Group Discussions
- C. Homework: Students are required to complete two hours of outside-of-class homework for each hour of lecture
- D. Lecture
- E. Multimedia Presentations

Methods of Evaluation

- A. Quizzes
- B. Homework
- C. Lab Projects
- D. Mid-term and final examinations

Examples of Assignments

Reading Assignments

1. Read the manual (man) page for the grep utility, taking note of the options that are available when executing this command. Be prepared to write grep commands to solve a series of problems in class.
2. Read the article "In the Beginning was the Command Line" by Neal Stephenson. Be prepared to discuss the culture of Linux as presented by Stephenson, in particular the "Egypt analogy" and the Debian distribution.

Writing Assignments

1. Write a one-page vi "starter guide" for a person who has never used the vi editor. In your guide, include a brief description of the history and key features of vi and an annotated list of the vi commands you consider to be most important for a new user to learn.
2. Using the LinuxCareer.com website as a starting place, and Internet research to gather additional information, write a 1-2 page report detailing the current demand for Linux professionals in the workforce, and the specific Linux skills required of these professionals.

Out-of-Class Assignments

1. Based on the commercial use case provided by the instructor, write a report detailing your recommendations for an open source web server and database server. Be sure to address security issues in your recommendation.
2. Design and implement a shell script to perform a backup of your home directory and all of its contents, including all directories, sub-directories, hidden files, and non-hidden files. Your script should compress the backup into a tarball. Test your script thoroughly and be prepared to demonstrate your working script in class.

Recommended Materials of Instruction

Bresnahan, Christine; Blum, Richard. (2019). LPIC-1 Linux Professional Institute Certification Study Guide Exam 101-500 and Exam 102-500. *Wiley, 5th*. 9781119582120.

Suehring, Steve. (2019). LPIC-1 Linux Professional Institute Certification Practice Tests: Exam 101-500 and Exam 102-500. *Wiley, 2nd*. 978-1-119-61109-7.

Shotts Jr., William E. (2019). The Linux Command Line: A Complete Introduction. *No Starch Press, 5th*.

Minimum Qualifications

Computer Information Systems
 Computer Science (Masters Required)
 Computer Service Technology

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