IT250
Linux Operating System
[Onsite]

Course Description:

Installation, configuration and management of a Linux operating system will be explored. Focus will be on functions that resemble the UNIX environment. Directory and file management, user account management and certain device management (such as drives, printers, interface cards, etc.) will be discussed.

Prerequisite(s) and/or Corequisite(s):

Prerequisites: TB143 Introduction to Personal Computers or equivalent

Credit hours: 4

Contact hours: 50 (30 Theory Hours, 20 Lab Hours)

Syllabus: Linux Operating System

Instructor:	_____
Office hours:	_____
Class hours:	_____

Major Instructional Areas

1. Introduction to Linux
2. Linux installation
3. Graphical user interface (GUI) desktops
4. Command-line interface (CLI) essentials
5. Hardware configuration: display, network, and printer
6. Networking: Resource sharing and remote access
7. Backup and restore utilities
8. Installing software in Linux
9. Scripting: Bourne Again Shell (bash) and Perl
10. Apache Web Server installation and configuration

Course Objectives

1. Discuss the history and unique characteristics of the Linux operating system.
2. Perform an installation of Linux.
3. Use the components and features of the GNOME desktop environment.
4. Perform basic tasks by using the command-line interface (CLI).
5. Use the various Linux process management features.
6. Create and execute basic scripts by using the Perl programming language and Bourne Again Shell (bash).
7. Configure computer hardware in Linux.
8. Administer and maintain a Linux system.
9. Install and update software in Linux

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10. Access Linux network services using a Linux client system.
11. Configure basic settings on an Apache Web server.
12. Manage and troubleshoot an Apache Web server.

SCANS Objectives

SCANS is an acronym for Secretary's Commission on Achieving Necessary Skills. The committee, created by the National Secretary of Labor in the early 1990s, created a list of skills and competencies that the committee feels are necessary for employees to function in a high-tech job market.

1. Competently perform the tasks of acquiring data and evaluating information to determine specific information needs.
2. Organize, process, and maintain written or computerized records systematically.
3. Use computers to acquire, organize, analyze, and communicate information.
4. Competently use computers to process information, including typing, modifying, retrieving, storing, and verifying data.
5. Work collaboratively with others and contribute to the group with ideas, suggestions, and effort.
6. Learn about how technological systems work and operate effectively.
7. Demonstrate competence in applying technology.

Course Outline

Note: All graded activities, except the Project, are listed below in the pattern of <Unit Number>.<Assignment Number>. For example, Lab 1.5 refers to the 5th lab activity in Unit 1.

Unit	Activities
1– An Introduction to Linux	• Content Covered: *A Practical Guide to Fedora and Red Hat Enterprise Linux:* o Chapter 1, "Welcome to Linux" o Chapter 2, "Installation Overview" o Chapter 3, "Step-by-Step Installation," pp. 51-84 • Assignments: 1.1

Unit	Activities
	• Labs: 1.1

2–
 	
The Linux Desktop
	• Read from *A Practical Guide to Fedora and Red Hat Enterprise Linux:*
	  ○ Chapter 4, “Introduction to Fedora and Red Hat Enterprise Linux,” pp. 89-109
	  ○ Chapter 8, “Linux GUIs: X and GNOME”
	• Assignments: 2.1
	• Labs: 2.1
	• Quizzes: 2.1

3–
 	
Command-Line Interface Basics
	• Read from *A Practical Guide to Fedora and Red Hat Enterprise Linux:*
	  ○ Chapter 5, “The Linux Utilities,” pp. 147-166 and pp. 174-181
	  ○ Chapter 6, “The Linux Filesystem,” pp. 187-207 and pp. 211-218
	• Assignments: 3.1
	• Labs: 3.1-3.2
	• Quizzes: 3.1

4–
 	
More Command-Line Interface
	• Read from *A Practical Guide to Fedora and Red Hat Enterprise Linux:*
	  ○ Chapter 7, “The Shell”
	  ○ Chapter 9, “The Bourne Again Shell,” pp. 279-299 and pp. 314-335
	• Assignments: 4.1
	• Labs: 4.1-4.3
	• Quizzes: 4.1

5–	• Read from *A Practical Guide to Fedora and Red Hat Enterprise Linux:*

Unit	Activities
Scripting in Linux	○ Chapter 27, “Programming the Bourne Again Shell” ○ Chapter 28, “The Perl Scripting Language” • Assignments: 5.1 • Labs: 5.1-5.4 • Quizzes: 5.1
6– Peripheral Hardware Configuration	• Read from *A Practical Guide to Fedora and Red Hat Enterprise Linux:* ○ Chapter 3, “Step-by-Step Installation,” pp. 84-85 ○ Chapter 14, “Printing with CUPS,” pp. 519-527 and pp. 530-540 ○ Chapter 17, “Configuring a LAN,” pp. 595-599 • Assignments: 6.1 • Labs: 6.1-6.4 • Quizzes: 6.1
7– Linux Network Services	• Read from *A Practical Guide to Fedora and Red Hat Enterprise Linux:* ○ Chapter 10, “Networking and the Internet” ○ Chapter 18, “OpenSSH: Secure Network Communication” ○ Chapter 19, “FTP: Transferring Files Across a Network” • Assignments: 7.1 • Labs: 7.1-7.3 • Quizzes: 7.1
8– Installing Software in Linux	• Read from *A Practical Guide to Fedora and Red Hat Enterprise Linux:* ○ Chapter 13, “Downloading and Installing Software” • Assignments: 8.1

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Unit	Activities
	• Labs: 8.1-8.2 • Quizzes: 8.1

9–
Basic Linux Administration
	• Read from *A Practical Guide to Fedora and Red Hat Enterprise Linux:*
	  ○ Chapter 11, “System Administration: Core Concepts,” pp. 403-435
	  ○ Chapter 16, “Administration Tasks”
	• Assignments: 9.1
	• Labs: 9.1-9.3
	• Quizzes: 9.1

10– Basic Apache Configuration and Management	• Read from *A Practical Guide to Fedora and Red Hat Enterprise Linux:* ○ Chapter 26, “Apache (httpd): Setting Up a Web Server” • Assignments: 10.1 • Labs: 10.1-10.5
11– Course Review and Final Exam	• Review Session • Final Exam

Instructional Methods

The Linux Operating System course incorporates various learning strategies such as quizzes, homework assignments, lab exercises, and a final exam to help you understand concepts. Each unit includes a homework assignment that may require you to work on chapter-end questions, write short paragraphs, or conduct research using the ITT Tech Virtual Library. The assignments are based on the concepts discussed within that unit. Units 2-10 have one quiz each. The quizzes will help you analyze your learning and recall of previously taught concepts. Each unit has at least one lab exercise in which you will perform hands-on exercises involving various Linux operating system concepts. Unit 11 includes the final exam, which evaluates your understanding of the Linux operating system concepts covered in this course.

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Instructional Materials and References

Student Textbook Package

- Sobell, Mark G. *A Practical Guide to Fedora and Red Hat Enterprise Linux. 5th ed. Upper* Saddle River, NJ: Pearson Prentice Hall, 2010.
- Fedora 12 DVD (shipped in the textbook)

References

ITT Tech Virtual Library

Log on to the ITT Tech Virtual Library at http://library.itt-tech.edu/ to access online books, journals, and other reference resources selected to support ITT Tech curricula.

Books

You may click “Books” or use the “Search” function on the home page to find the following books.

Main Menu> Books> Research Collections> Ebrary

- Brown, Martin C. *Linux Transfer for Windows Power Users: A Roadmap for Migrating to Linux for Experienced Windows Users. Whitefish Bay, WI: Hentzenwerke Publishing, 2004.*
- Grant, Rickford. *Linux for Non-Geeks. San Francisco: No Starch Press, Inc.,* 2004.
- Jang, Michael. *SAIR Linux/GNU Installation & Configuration Exam Cram: Exam 3X0-101. Scottsdale, AZ: The Coriolis Group. LLC, 2001.*
- Specialized Systems Consultants Staff (CB). *Linux in the Workplace. San* Francisco: No Starch Press, Inc., 2002.

Main Menu> Books> Research Collections> NetLibrary

- Barkakati, Nabajyoti. *Red Hat Linux Fedora All-in-one Desk Reference for Dummies. Hoboken, NJ: John Wiley & Sons, Inc., 2004.*

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- Negus, Chris. *Linux Bible. Indianapolis, IN: John Wiley & Sons, Inc. (US),* 2005.
- Smith, Roderick W. *Linux+ Study Guide. 3rd ed. San Francisco: Sybex* Books, 2005.

Main Menu> Books> Digital Collections> O'Reilly Open Books Project

- *OpenSources Voices from the Open Source Revolution. Beijing: O'Reilly,* 1999.
- Raymond, Eric S. *The Cathedral & the Bazaar: Musings on Linux and Open Source by an Accidental Revolutionary. Sebastopol, CA: O'Reilly Media, Inc., 2001.*
- St. Laurent, Andrew M. *Understanding Open Source and Free Software Licensing. Sebastopol, CA: O'Reilly Media, Inc., 2004.*
- Williams, Sam. *Free as in Freedom: Richard Stallman's Crusade for Free Software. Sebastopol, CA: O'Reilly Media, Inc., 2002.*

Periodicals

You may click "Periodicals" or use the "Search" function on the home page to find the following periodicals.

Main Menu> Periodicals> Research Databases> ACM Digital Library (Type in the search term "Linux desktop")

- Gray, James. "Linux and the Enterprise Desktop: Where Are We Today?" *Linux Journal July 2008.*
- Gagné, Marcel. "Cooking with Linux: the evolution of the desktop–how far from the pinnacle?" *Linux Journal March 2009.*

Reference Resources

You may click "Reference Resources" or use the "Search" function on the home page to find the following reference resources.

Main Menu> Reference> Computers

- Linux.com
- The Linux Documentation Project

Program Links

You may click School of Study> School of Information Technology or use the "Search" function on the home page to find the following program links.

Main Menu> School of Study> School of Information Technology> Recommended Links> Certification

- Linux Professional Institute Certification
- RedHat Certifications

Main Menu> School of Study> School of Information Technology> Recommended Links

- Loads of Linux Links
- Tech Republic
- Whatis.com: The IT-specific Encyclopedia

Main Menu> School of Study> School of Information Technology> Tutorial Links

- Linux Lessons

Other References

The following resources may be found **outside** of the ITT Tech Virtual Library.

Periodicals

- Linux Pro Magazine
  http://www.linuxpromagazine.com
  News, reviews, blogs, and information for Linux programmers

Web sites

- Anaconda—Fedora Project Wiki

  http://fedoraproject.org/wiki/Anaconda (accessed Dec. 22, 2009).

  This Web page provides details about anaconda, which is the installer used by Fedora, Red Hat Enterprise Linux, and other distros.

- BASH—GNU Project—Free Software Foundation (FSF)

  http://www.gnu.org/software/bash/ (accessed Dec. 22, 2009).

  This site provides information on bash, which is the shell, or command language interpreter, in the GNU operating system.

- Common UNIX Printing System

  http://www.cups.org/ (accessed Dec. 22, 2009).

  This Web page provides details about the Common UNIX Printing System, or CUPS, an open source printing system.

- Fedora 10 and 11 Installation Guide

  http://docs.fedoraproject.org/install-guide (accessed Dec. 22, 2009).

  This site explains how to acquire and install Fedora.

- Fedora Project

  http://fedoraproject.org/ (accessed Dec. 22, 2009).

  This community-driven Web site provides information on Fedora, a free Linux-based operating system.

- Filesystem Hierarchy Standard

  http://proton.pathname.com/fhs/ (accessed Dec. 22, 2009).

  This is the home page of the Filesystem Hierarchy Standard (FHS) version 2.3.

- GNOME: The Free Software Desktop Project

  http://www.gnome.org/ (accessed Dec. 22, 2009).

  This Web site offers information on GNOME, an easy-to-understand desktop for GNU/Linux or UNIX computers

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- K Desktop Environment–Be free

  http://www.kde.org/ (accessed Dec. 22, 2009).

  This Web site provides information on KDE, or the K Desktop Environment, which is a network-transparent contemporary desktop environment for Linux and UNIX platforms.

- OpenSSH

  http://www.openssh.com/ (accessed Dec. 22, 2009).

  This Web site provides details about OpenSSH, a free version of the

  SSH connectivity tools.

- The Free Software Definition

  http://www.gnu.org/philosophy/free-sw.html (accessed Dec. 22, 2009).

  The Web page from the Free Software Foundation defines free software; it also provides links to categories and translations of free software.

- OpenOffice–The Free and Open Productivity Suite

  http://www.openoffice.org/ (accessed Dec. 22, 2009).

  This Web site provides an office suite that is compatible with all other major office suites and is free to download, use, and distribute.

- The Open Source Definition (Annotated)

  http://opensource.org/docs/definition.php (accessed Dec. 22, 2009).

  This Web page from the Open Source Initiative defines open-source software.

- UNIX History

  http://www.levenez.com/unix/ (accessed Dec. 22, 2009).

  This Web page provides a timeline on the history of UNIX as well as some useful links related to UNIX.

- vi Editor Cheat Sheet

  http://www.kcomputing.com/vi.html (accessed Dec. 22, 2009).

  This Web page provides a cheat sheet for learning the vi editor.

- vim online

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http://www.vim.org/ (accessed Dec. 22, 2009).

This Web site run by the vim community stores tips and tools for this text editor.

- X.Org Foundation

  http://wiki.x.org/wiki/ (accessed Dec. 22, 2009).

  This Web site is the wiki supporting an open-source implementation of the X Window System.

All links to Web references outside of the ITT Tech Virtual Library are always subject to change without prior notice.

Course Evaluation and Grading

Evaluation Criteria Table

The final grades will be based on the following categories:

CATEGORY	WEIGHT
Assignments	25%
Labs	30%
Quizzes	20%
Final Exam	25%
Total	**100%**

Note: Students are responsible for abiding by the Plagiarism Policy.

Grade Conversion Table

The final grades will be calculated from the percentages earned in the course, as follows:

A	90-100%	4.0
B+	85-89%	3.5
B	80-84%	3.0
C+	75-79%	2.5
C	70-74%	2.0
D+	65-69%	1.5
D	60-64%	1.0
F	<60%	0.0

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(End of Syllabus)

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