

# **IT250T**

## **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: TB143T Introduction to Personal Computers or equivalent

**Credit hours: 4**

**Contact hours: 60 (36 Theory Hours, 24 Lab Hours)**

# Syllabus: Linux Operating System

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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. Perform an installation of Linux.
2. Use the components and features of the GNOME desktop environment.
3. Perform basic tasks by using the command-line interface (CLI).
4. Perform basic tasks by using the command-line interface (CLI) and use the various Linux process management features.

5. Use the various Linux process management features. Create and execute basic programs by using the perl programming language and Bourne Again Shell (bash).
6. Configure computer hardware in Linux.
7. Access Linux network services from a Linux client system.
8. Install and update Linux software.
9. Administer and maintain a Linux system.
10. Configure basic settings on 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
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Unit	Activities
1– An Introduction to Linux	<ul style="list-style-type: none"> <li>• Content Covered:               <ul style="list-style-type: none"> <li>○ <i>A Practical Guide to Fedora and Red Hat Enterprise Linux:</i></li> <li>○ Chapter 1, “Welcome to Linux”</li> <li>○ Chapter 2, “Installation Overview”</li> <li>○ Chapter 3, “Step-by-Step Installation,” pp. 51-84</li> </ul> </li> <li>• Assignments: 1.1</li> <li>• Labs: 1.1-1.3</li> </ul>
2– The Linux Desktop	<ul style="list-style-type: none"> <li>• Read from <i>A Practical Guide to Fedora and Red Hat Enterprise Linux:</i> <ul style="list-style-type: none"> <li>○ Chapter 4, “Introduction to Fedora and Red Hat Enterprise Linux,” pp. 89-119</li> <li>○ Chapter 8, “Linux GUIs: X and GNOME”</li> </ul> </li> <li>• Assignments: 2.1</li> <li>• Labs: 2.1</li> <li>• Quizzes: 2.1</li> </ul>
3– Command-Line Interface Basics	<ul style="list-style-type: none"> <li>• Read from <i>A Practical Guide to Fedora and Red Hat Enterprise Linux:</i> <ul style="list-style-type: none"> <li>○ Chapter 5, “The Linux Utilities,” pp. 147-166</li> <li>○ Chapter 6, “The Linux Filesystem,” pp. 185-207 and pp. 213-218</li> </ul> </li> <li>• Assignments: 3.1</li> <li>• Labs: 3.1-3.4</li> <li>• Quizzes: 3.1</li> </ul>
4– More Command-Line Interface	<ul style="list-style-type: none"> <li>• Read from <i>A Practical Guide to Fedora and Red Hat Enterprise Linux:</i> <ul style="list-style-type: none"> <li>○ Chapter 7, “The Shell”</li> <li>○ Chapter 9, “The Bourne Again Shell,” pp. 279-299 and pp. 315-337</li> </ul> </li> <li>• Assignments: 4.1</li> </ul>

Unit	Activities
	<ul style="list-style-type: none"> <li>• Labs: 4.1-4.3</li> <li>• Quizzes: 4.1</li> </ul>
5– Scripting in Linux	<ul style="list-style-type: none"> <li>• Read from <i>A Practical Guide to Fedora and Red Hat Enterprise Linux</i>: <ul style="list-style-type: none"> <li>○ Chapter 27, “Programming the Bourne Again Shell”</li> <li>○ Chapter 28, “The Perl Scripting Language”</li> </ul> </li> <li>• Assignments: 5.1</li> <li>• Labs: 5.1-5.4</li> <li>• Quizzes: 5.1</li> </ul>
6– Peripheral Hardware Configuration	<ul style="list-style-type: none"> <li>• Read from <i>A Practical Guide to Fedora and Red Hat Enterprise Linux</i>: <ul style="list-style-type: none"> <li>○ Chapter 3, “Step-by-Step Installation,” p. 85</li> <li>○ Chapter 14, “Printing with CUPS”</li> <li>○ Chapter 17, “Configuring a LAN”</li> </ul> </li> <li>• Assignments: 6.1</li> <li>• Labs: 6.1-6.4</li> <li>• Quizzes: 6.1</li> </ul>
7– Linux Network Services	<ul style="list-style-type: none"> <li>• Read from <i>A Practical Guide to Fedora and Red Hat Enterprise Linux</i>: <ul style="list-style-type: none"> <li>○ Chapter 10, “Networking and the Internet”</li> <li>○ Chapter 18, “OpenSSH: Secure Network Communication”</li> <li>○ Chapter 19, “FTP: Transferring Files Across a Network”</li> </ul> </li> <li>• Assignments: 7.1</li> <li>• Labs: 7.1</li> <li>• Quizzes: 7.1</li> </ul>
8– Installing Software in Linux	<ul style="list-style-type: none"> <li>• Read from <i>A Practical Guide to Fedora and Red Hat Enterprise Linux</i>: <ul style="list-style-type: none"> <li>○ Chapter 13, “Downloading and Installing Software”</li> </ul> </li> </ul>

Unit	Activities
	<ul style="list-style-type: none"> <li>• Assignments: 8.1</li> <li>• Labs: 8.1-8.3</li> <li>• Quizzes: 8.1</li> </ul>
9–  Basic Linux Administration	<ul style="list-style-type: none"> <li>• Read from <i>A Practical Guide to Fedora and Red Hat Enterprise Linux</i>:               <ul style="list-style-type: none"> <li>○ Chapter 11, “System Administration: Core Concepts,” pp. 407-425</li> <li>○ Chapter 16, “Administration Tasks”</li> </ul> </li> <li>• Assignments: 9.1</li> <li>• Labs: 9.1-9.3</li> <li>• Quizzes: 9.1</li> </ul>
10–  Basic Apache Configuration and Management	<ul style="list-style-type: none"> <li>• Read from <i>A Practical Guide to Fedora and Red Hat Enterprise Linux</i>:               <ul style="list-style-type: none"> <li>○ Chapter 26, “Apache (httpd): Setting Up a Web Server”</li> </ul> </li> <li>• Assignments: 10.1</li> <li>• Labs: 10.1-10.</li> </ul>
11–  Course Review and Final Exam	<ul style="list-style-type: none"> <li>• Review Session</li> <li>• Final Exam</li> </ul>

## 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.

## Instructional Materials and References

### Student Textbook Package

- Sobell, Mark G. *A Practical Guide to Fedora and Red Hat Enterprise Linux. 6<sup>th</sup> ed.* Upper Saddle River, NJ: Pearson Prentice Hall, 2012.
- Fedora 15 DVD (shipped in the textbook)

### References

- ITT Tech Virtual Library:  
<http://myportal.itt-tech.edu/library/Pages/HomePage.aspx>

### 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.

- 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")

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

### Professional Organizations

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



Main Menu> School of Study> School of Information Technology> Professional Organizations

- Association of Information Technology Professionals
- IEEE Computer Society

### Recommended Links

You may click School of Study> School of Information Technology or use the “Search” function on the home page to find the following Recommended 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> General

- Linux Security.com
- TechRepublic
- Whatis.com: The IT-specific Encyclopedia

Main Menu> School of Study> School of Information Technology> Recommended Links> Online magazines and journals

- LINUX JOURNAL
- NEWSFORGE: Linux/Open Source

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

- Loads of Linux Links

### 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

### Tutorial Links

You may click School of Study> School of Information Technology or use the “Search” function on the home page to find the following Tutorial Links.

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

- Linux Lessons
- Faculty Collaboration Portals:  
<http://myportal.itt-tech.edu/employee/dept/curriculum/FC/default.aspx>
- Curriculum Management Database:  
<http://myportal.itt-tech.edu/faculty/cdb/Pages/default.aspx>

### **Other References**

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

#### Books

- *The Linux Cookbook: Tips and Techniques for Everyday Use*  
[www.dsl.org/cookbook/cookbook\\_toc.html](http://www.dsl.org/cookbook/cookbook_toc.html) (accessed 3/12/12)  
This online book is a hands-on guide to getting things done on a Linux system, designed for the everyday user who is not necessarily a computer programmer.

- Smith, R. *Linux+ Complete Study Guide (Exams LX0-101 and LX0-102)*. Indianapolis, IN: Wiley Publishing, Co., 2010.

### Periodicals

- Linux Pro Magazine  
<http://www.linuxpromagazine.com> (accessed Feb. 29, 2012)  
News, reviews, blogs, and information for Linux programmers

### Websites

- Anaconda–Fedora Project Wiki  
<http://fedoraproject.org/wiki/Anaconda> (accessed Feb. 29, 2012)

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 Feb. 29, 2012)

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 Feb. 29, 2012)

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

- Fedora Project  
[docs.fedoraproject.org](http://docs.fedoraproject.org) (accessed Feb. 29, 2012)

Many resources are available here. On the left panel of the site, choose your preferred language at the top. Click the version number to see manuals released specifically for that version. Next to each manual name is a pull-down to choose the format (html, html-single, or pdf). Not all manuals are available for all released versions, and not all manuals are available in every language. Direct links for Fedora 15, English, html documents are:

- Deployment Guide:  
[http://docs.fedoraproject.org/en-US/Fedora/15/html/Deployment\\_Guide/index.html](http://docs.fedoraproject.org/en-US/Fedora/15/html/Deployment_Guide/index.html) (accessed 3/12/12)

- Installation Guide:  
[http://docs.fedoraproject.org/en-US/Fedora/15/html/Installation\\_Guide/sn-making-media.html#sn-making-disc-media](http://docs.fedoraproject.org/en-US/Fedora/15/html/Installation_Guide/sn-making-media.html#sn-making-disc-media) (accessed 3/12/12)
- Filesystem Hierarchy Standard  
<http://proton.pathname.com/fhs/> (accessed Feb. 29, 2012)  

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 Feb. 29, 2012)  

This website offers information on GNOME, an easy-to-understand desktop for GNU/Linux or UNIX computers.
- K Desktop Environment–Be free  
<http://www.kde.org/> (accessed Feb. 29, 2012)  

This website 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 Feb. 29, 2012)  

This website 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 Feb. 29, 2012)  

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 Feb. 29, 2012)  

This website 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 Feb. 29, 2012)

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

- UNIX History

<http://www.levenez.com/unix/> (accessed Feb. 29, 2012)

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 Feb. 29, 2012)

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

- vim online

<http://www.vim.org/> (accessed Feb. 29, 2012)

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

- X.Org Foundation

<http://wiki.x.org/wiki/> (accessed Feb. 29, 2012)

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

- Learning the Shell

[http://linuxcommand.org/learning\\_the\\_shell.php](http://linuxcommand.org/learning_the_shell.php) (accessed Feb. 29, 2012)

This site explains the importance of and how to learn to use the shell.

- GNU Manuals Online

[www.gnu.org/manual](http://www.gnu.org/manual) (accessed Feb. 29, 2012)

This site lists official GNU packages with links to their primary documentation, where available.

- Welcome to JustLinux

[www.justlinux.com](http://www.justlinux.com) (accessed Feb. 29, 2012)

[This site is an online forum of users helping users; it includes a large help file library.](#)

- The Linux Documentation Project

<http://tldp.org/> (accessed Feb. 29, 2012)

The Linux Documentation Project is an organization of volunteers authoring, reviewing, and managing documents about the Linux operating system.

- Linux Software equivalent to Windows software  
[http://wiki.linuxquestions.org/wiki/Linux\\_software\\_equivalent\\_to\\_Windows\\_software](http://wiki.linuxquestions.org/wiki/Linux_software_equivalent_to_Windows_software) (accessed Feb. 29, 2012)  
This site lists popular Windows software in multiple categories and their equivalent Linux programs, along with links to download the Linux versions.

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%
<b>Total</b>	<b>100%</b>

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

*(End of Syllabus)*