ITT Technical Institute

IT302

Linux System Administration

Onsite Course

SYLLABUS

Credit hours: 4

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

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

Prerequisite: IT250 Linux Operating System

Course Description:

This course covers intermediate to advanced system and network administrative tasks and related skills required by a Linux based network. Functional areas include the setup, configuration, maintenance, security and troubleshooting of Linux servers and related services in a complex network environment. Tools and scripting skills associated with these areas will also be discussed.

Syllabus: Linux System Administration

Instructor:	_____
Office hours:	_____
Class hours:	_____

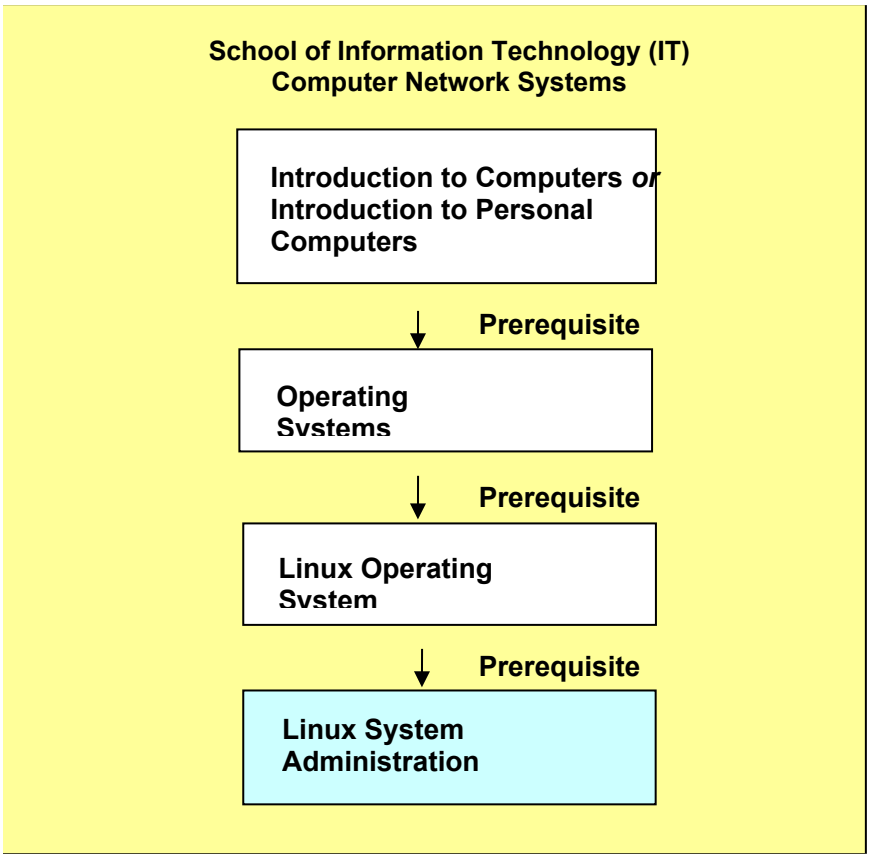
Where Does This Course Belong?

How does this course relate to the program? Take a look!

Linux System Administration is a course required to earn an Associate of Applied Science Degree in the Information Technology-Computer Network Systems program.

Graduates of this program may begin their careers in a variety of entry-level positions in various fields involving information technology-computer network systems, such as computer network analyst, computer network technician, help desk analyst, and WAN/LSAN technician.

The following course sequence provides an overview of how Linux System Administration fits in the program.



Note: Refer to the catalog for the state-specific course information.

Major Instructional Areas

1. Configuring file-sharing servers, including Samba and Apache
2. Configuring essential network addressing services, including DHCP, DNS, and other traditional network services
3. Configuring email servers, such as sendmail and Dovecot
4. Scripting in Linux
5. Linux server security

Course Objectives

1. Install Linux with common network services running at appropriate runlevels.
2. Configure security on a Linux server using standard Fedora tools.
3. Configure basic network services for printing and remote access.
4. Configure LAN file-sharing services.
5. Configure Internet file-sharing services.
6. Configure Internet Protocol (IP) addressing and resolution services.
7. Configure Simple Mail Transfer Protocol (SMTP) and Post Office Protocol version 3 (POP3) mail services.
8. Configure directory services on Linux.
9. Manipulate data using regular expressions and common UNIX utilities.

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 ideas, suggestions, and effort to the group.
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 and Final Exam, are listed below in the pattern of <Unit Number>.<Assignment Number>. For example, Labs: 1.3 refers to the 3rd lab activity in Unit 1.

Unit	Activities
1— Linux Server Installation and Configuration	• Content Covered: *A Practical Guide to Fedora™ and Red Hat® Enterprise Linux®*: o Chapter 2, "Installation Overview" (reference only) o Chapter 3, "Step-by-Step Installation" (reference only) • Assignments: 1.1 • Labs: 1.1, 1.2, 1.3, 1.4, 1.5

Unit	Activities

2—
Linux Security Basics
	• Read from *A Practical Guide to Fedora™ and Red Hat® Enterprise Linux®*:
	  ○ Chapter 11, “System Administration: Core Concepts,” pp. 459-489
	  ○ Chapter 25, “system-config-firewall and iptables: Setting Up a Firewall”
	• Quizzes: 2.1
	• Research Assignments: 2.1 (Start)
	• Assignments: 2.1
	• Labs: 2.1, 2.2

3—
Printing and Remote Access
	• Read from *A Practical Guide to Fedora™ and Red Hat® Enterprise Linux®*:
	  ○ Chapter 14, “Printing with CUPS”
	  ○ Chapter 18, “OpenSSH: Secure Network Communication”
	• Quizzes: 3.1
	• Assignments: 3.1
	• Labs: 3.1, 3.2

4—
LAN File Sharing
	• Read from *A Practical Guide to Fedora™ and Red Hat® Enterprise Linux®*:
	  ○ Chapter 22, “NFS: Sharing Directory Hierarchies”
	  ○ Chapter 23, “Samba: Linux and Windows File and Printer Sharing”
	• Quizzes: 4.1
	• Assignments: 4.1
	• Research Assignments: 2.1 (Submit)
	• Research Assignments: 4.1 (Start)
	• Labs: 4.1, 4.2, 4.3, 4.4, 4.5, 4.6

5—
Internet File Sharing
	• Read from *A Practical Guide to Fedora™ and Red Hat® Enterprise Linux®*:
	  ○ Chapter 19, “FTP: Transferring Files Across a Network”
	  ○ Chapter 26, “Apache (httpd): Setting Up a Web Server”
	• Quizzes: 5.1
	• Assignments: 5.1
	• Labs: 5.1, 5.2, 5.3, 5.4

6—
Internet Addressing Servers
	• Read from *A Practical Guide to Fedora™ and Red Hat® Enterprise Linux®*:
	  ○ Chapter 11, pp. 489-493, section titled “DHCP: Configures Network Interfaces”
	  ○ Chapter 24, pp. 846-865, sections titled “Setting Up a DNS Cache”, “JumpStart II: Setting Up a Domain Using system-config-bind”, “Configuring a DNS Server”
	• Quizzes: 6.1
	• Research Assignments: 4.1 (Submit)
	• Assignments: 6.1
	• Labs: 6.1, 6.2, 6.3, 6.4, 6.5

7— Internet Email	• Read from *A Practical Guide to Fedora™ and Red Hat® Enterprise Linux®*: ○ Chapter 20, “sendmail: Setting Up Mail Servers, Clients, and More”

Unit	Activities
	• Quizzes: 7.1 • Assignments: 7.1 • Labs: 7.1
8— Directory Services	• Read from *A Practical Guide to Fedora™ and Red Hat® Enterprise Linux®*: ○ Chapter 21, “NIS and LDAP” • Quizzes: 8.1 • Assignments: 8.1 • Labs: 8.1, 8.2

9—
Regular Expressions and Scripting Utilities
	• Read from *A Practical Guide to Fedora™ and Red Hat® Enterprise Linux®*:
	  ○ Appendix A, “Regular Expressions” (in the textbook)
	  ○ Appendix I, “Lab 9.1 UNIX Scripting Utilities Handout” (provided by instructor)
	• Quizzes: 9.1
	• Assignments: 9.1
	• Labs: 9.1
	• Project (Start)

10— Course Project	• Project (Continue work)
11— Course Review and Final Exam	• Project (Submit) • Review Session • Final Exam

Instructional Methods

This course uses a variety of teaching strategies that support the outcomes described in the course objectives, fostering higher cognitive skills. Each unit provides multiple exercises to give you a solid foundation of where Linux can be applied in the business world. Weekly assignments, quizzes, and labs will monitor and assess your progress. In addition, you will complete a project and take a final exam. The course is designed to build on the Linux Operating System course and to add to your knowledge and hands-on skills. You are encouraged to log onto the ITT Technical Institute Virtual Library for additional research materials.

Instructional Materials and References

Student Textbook Package

- Sobell, Mark G. *A Practical Guide to Fedora™ and Red Hat® Enterprise Linux®*. 6th ed. Upper Saddle River, NJ: Pearson Prentice Hall, 2012.
- Sobell, Mark G. *Lab manual for A Practical Guide to Fedora and Red Hat Enterprise Linux*. 6th ed. Upper Saddle River, NJ: Prentice Hall, 2012.
- Fedora 15 DVD (shipped as part of the textbook)

(This textbook package was issued in the previous course, Linux Operating System.)

Equipment and Tools

- Student hard drive

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 Library Catalog on the home page to find the following books.

- Barkakati, Naba. *Linux All-in-One Desk Reference for Dummies*. 2nd ed. Hoboken, NJ: Wiley Publishing, Inc., 2006.
- Jang, Michael. *RHCE Red Hat Certified Engineer Linux Study Guide (Exam RH302)*. 5th ed. New York: McGraw-Hill/Osborne, 2007.
- Langridge, Stuart, and Tony Steidler-Dennison. *Run Your Own Web Server Using Linux & Apache*. Collingwood, VIC, Australia: SitePoint Pty. Ltd., 2005.
- Rash, Michael. *Linux Firewalls: Attack Detection and Response with iptables, psad, and fwsnort*. San Francisco: No Starch Press, Inc., 2007.
- Smith, Peter G. *Linux Network Security*. Hingham, MA: Charles River Media, Inc., 2005.

Periodicals

You may click “Periodicals” or use the E-Journal Lookup on the home page to find the following periodicals.

Full Text Electronic Journals>

- Linux Journal
  This online journal contains tips and tricks, in-depth tutorials, concise product reviews, insights from leading Linux personalities, and more.

EbscoHost>

- Bauer, Mick. “Introduction to SELinux.” *Linux Journal*, Feb2007 Issue 154, p36-39, 3p
- Bauer, Mick. “Introduction to SELinux, Part II.” *Linux Journal*, Mar2007, Issue 155, p30-33, 4p, 1c
- Szulik, Matthew J. “Open for change.” *Educause Review*, Jan/Feb2007, Vol. 42 Issue 1, p4-5, 2p, 1c

School of Study

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

Recomennded Links

- Certification> Linux Professional Institute Certification
- General> Linux Security.com

Tutorial Links

- Linux Lessons

Other References

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

Websites

- Fedora 15 Linux Documentation
  http://docs.fedoraproject.org/ (accessed April 3, 2012)
  The official documentation of Fedora 15 Linux
- LinuxInsider
  http://www.linuxinsider.com/ (accessed April 3, 2012)
  This site provides Linux news and information from around the world.
- LinuxSecurity.com
  http://www.linuxsecurity.com/ (accessed April 3, 2012)
  This Web site provides Linux news and information on security, open source, firewalls, and networks.

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
Labs	30%
Assignments	10%
Quizzes	10%
Research Assignments	15%
Project	15%
Final Exam	20%
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

(End of Syllabus)