

**Saint Leo University  
School of Business**

**COM 212  
Systems Administration**

**Course Description:**

This course provides a broad and detailed coverage of system administration from the basics of installing and configuring operating systems to managing and maintaining them by applying best practices in security. Many of the security aspects of successful system administration are covered including developing security policies, adopting access controls, managing user accounts, configuring password policies, using authentication methods, performing periodic updates, installing patches, securing file systems, following backup strategies, setting up secure network configuration, and maintaining security components such as IDPS and Firewalls.

**Textbook:**

Basta, A., Basta, N., Finamore, D., & Palladino, S. (2013). *Linux operations and administration* (1st ed.). Boston, MA: CENGAGE Learning. ISBN-13: 9781111035303.

OpenSUSE 11.2: GNOME

[http://mirrors.vbi.vt.edu/mirrors/linux/opensuse/discontinued/distribution/11.2/iso/openSUSE-11.2-GNOME-LiveCD-x86\\_64.iso](http://mirrors.vbi.vt.edu/mirrors/linux/opensuse/discontinued/distribution/11.2/iso/openSUSE-11.2-GNOME-LiveCD-x86_64.iso)

OpenSUSE 11.2: KDE

[http://mirrors.vbi.vt.edu/mirrors/linux/opensuse/discontinued/distribution/11.2/iso/openSUSE-11.2-KDE4-LiveCD-x86\\_64.iso](http://mirrors.vbi.vt.edu/mirrors/linux/opensuse/discontinued/distribution/11.2/iso/openSUSE-11.2-KDE4-LiveCD-x86_64.iso)

**Learning Outcomes:**

The student, upon fulfillment of the requirements of the course, should be able to:

1. Install, configure, operate and maintain operating systems;
2. Set up user accounts, groups and enforce password policies;
3. Perform auditing, logging, back-up and recovery;
4. Execute commands on the command-line, and run shell scripts;
5. Configure networking elements with network security and manage resources such as files, printers, and mail server;
6. Install, configure, operate and maintain security components including updates and patches;
7. **VALUES OUTCOMES:** This course will strengthen the Core Value of Personal Development in one's ability to handle operating systems, not just as a user, but as an administrator who has a firm grasp of installing, configuring, operating and maintaining operating systems. Furthermore, all this to be done securely, both of the OS and its components, inculcating the Core Value of Integrity in the student.

**Saint Leo Core Values:**

*Personal Development:* Saint Leo University stresses the development of every person's mind, spirit, and body for a balanced life. All members of the Saint Leo University community must demonstrate their commitment to personal development to help strengthen the character of our community.

*Integrity:* The commitment of Saint Leo University to excellence demands that its members live its mission and deliver on its promise. The faculty, staff, and students pledge to be honest, just, and consistent in word and deed.

**Evaluation:**

**Assignment**

**Percentage**

Quizzes (2)	15
Midterm Exam	15
Final Exam	15
Discussions (8)	10
Labs	30
Homework	15
<b>Total</b>	<b>100%</b>

### Grading Scale (%)

A	95-100%
A-	90-94%
B+	86-89%
B	83-85%
B-	80-82%
C	75-79%
F	Below 75%

### Quizzes and Exams

Modules 2 and 6 contain a multiple-choice and true/false quiz consisting of 15 questions. You will have 20 minutes to complete each quiz once you begin. Each quiz will need to be completed by no later than the Sunday of that module. Quiz 1 covers Chapters 1-4 of your textbook, and Quiz 2 covers Chapters 9-12 of your textbook.

Modules 4 and 8 contain a multiple-choice, true/false, and short essay exam consisting of 30 questions. You will have 35 minutes to complete the Midterm and 40 minutes to complete the Final once you begin. Each exam will need to be completed by no later than the Sunday of that module. The Midterm Exam covers Chapters 1-8 of your textbook, and the Final Exam covers Chapters 9-16 of your textbook.

### Labs

Modules 1-8 contain lab exercises that must be completed by no later than Sunday of the respective module. A worksheet is provided to document your completion of the labs and must be uploaded to the appropriate Assignment folder when finished. You may access the lab worksheets by clicking on the Labs link under each module menu and selecting the attachments. Be sure to follow the directions in the worksheet as well as those listed in your textbook.

### Discussions

At the beginning of the course, your instructor will assign you to Group A or Group B. You will respond to your group's discussion question board first by no later than Thursday of each module. You will then respond to two classmates' discussion posts on the opposite discussion board by no later than Sunday of each module. Be sure to follow the directions under the discussion board each week.

### Homework

Modules 1, 3, 4, 5, 6, and 8 all contain short homework assignments. These assignments are found in your textbook as case projects. Be sure to read the directions and complete the case projects identified in the Homework link under the module menu. You will type your answers/responses to the assignments in a Word doc and upload them to the appropriate Assignment folder by no later than the Sunday of the module in which they are due.

### Assessment of the Learning Outcomes:

Learning Outcome	Mandatory Assessment Method(s)	Optional Assessment Method(s)
1	Labs, Homework	Quiz question; Discussion
2	Quiz question; Labs, Homework	Exam question; Discussion
3	Quiz question; Labs, Homework	Exam question; Discussion
4	Lab exercise, Homework	Quiz question; Discussion
5	Exam question; Labs, Homework	Quiz question; Discussion
6	Quiz question, Labs, Homework	Exam question; Discussion
7	Exam question; Labs	Discussion

## Course Schedule:

### Module 1 Intro to Linux and Installing openSUSE

#### Objectives

When you complete this module, you should be able to:

- Summarize the functions of an operating system.
- Identify key historical points in the development of Linux.
- Explain the components of the Linux architecture and features of the operating system.
- Check your system configuration to determine whether it meets openSUSE installation requirements.
- Describe the benefits of installing an OS on a virtual machine.
- Summarize the installation phases in openSUSE.
- Describe features of the GNOME and KDE desktop environments.

#### Reading

Chapters 1 and 2

#### Assignments

Items to be Completed:	Due No Later Than:
Post an initial response to your group's discussion board	Thursday 11:59 PM EST/EDT
Post responses to at least two classmates on the opposite discussion board	Sunday 11:59 PM EST/EDT
Complete and submit Labs	Sunday 11:59 PM EST/EDT
Complete Homework Case 1-1	Sunday 11:59 PM EST/EDT

### Module 2 Managing Files and Directories and Using Text Editors

#### Objectives

When you complete this module, you should be able to:

- Describe the Linux file system and the Filesystem Hierarchy Standard.
- Navigate the Linux directory structure.
- Manage files and directories in Linux.
- Describe key features of GUI and command-line text editors available in Linux.
- Use the vim editor to create and edit text files.

#### Reading

Chapters 3 and 4

Items to be Completed:	Due No Later Than:
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## Assignments

Post an initial response to your group's discussion board	Thursday 11:59 PM EST/EDT
Post responses to at least two classmates on the opposite discussion board	Sunday 11:59 PM EST/EDT
Complete and submit Labs	Sunday 11:59 PM EST/EDT
Complete Quiz 1	Sunday 11:59 PM EST/EDT

## Module 3

### Shell Scripts and Managing Data

#### Objectives

When you complete this module, you should be able to:

- Identify and change Linux file permissions.
- Create and run shell scripts.
- Perform system backups at the command line.
- Compress and decompress files at the command line.
- Explain how to schedule backups with a cron table.

#### Reading

Chapters 5 and 6

#### Assignments

Items to be Completed:	Due No Later Than:
Post an initial response to your group's discussion board	Thursday 11:59 PM EST/EDT
Post responses to at least two classmates on the opposite discussion board	Sunday 11:59 PM EST/EDT
Complete and submit Labs	Sunday 11:59 PM EST/EDT
Complete Homework Case 6-1	Sunday 11:59 PM EST/EDT

## Module 4

### Managing User Groups and Network Services

#### Objectives

When you complete this module, you should be able to:

- Identify key user account information in the `/etc/passwd` and `/etc/shadow` configuration files.
- Describe the default user and group information in the `/etc/login.defs` and `/etc/default/useradd` configuration files.
- Create and modify user accounts at the command line.
- Create and modify groups at the command line.
- Manage user and group accounts with the YaST utility.
- Identify the important protocols at each layer of the TCP/IP model.
- Describe IP addresses and the difference between the network and host portions of an IP address.
- Convert decimal IP addresses into binary numbers.
- Describe the five TCP/IP classes.

#### Reading

Chapters 7 and 8

## Assignments

Items to be Completed:	Due No Later Than:
Post an initial response to your group's discussion board	Thursday 11:59 PM EST/EDT
Post responses to at least two classmates on the opposite discussion board	Sunday 11:59 PM EST/EDT
Complete and submit Labs	Sunday 11:59 PM EST/EDT
Complete Homework Case 8-1	Sunday 11:59 PM EST/EDT
Complete the Midterm Exam	Sunday 11:59 PM EST/EDT

## Module 5

### Installing Software Packages and Web Servers

#### Objectives

When you complete this module, you should be able to:

- Manage software packages with the RPM utility.
- Handle RPM software dependencies.
- Install, upgrade, and remove software at the command line.
- Add remote software repositories in openSUSE.
- Work with software packages in YaST Software Manager.
- Install Apache Web Server along with additional Apache modules.
- Configure an Apache Web server with a GUI utility and by modifying Apache configuration files.
- Create a Web page by writing an HTML script.

#### Reading

Chapters 9 and 10

## Assignments

Items to be Completed:	Due No Later Than:
Post an initial response to your group's discussion board	Thursday 11:59 PM EST/EDT
Post responses to at least two classmates on the opposite discussion board	Sunday 11:59 PM EST/EDT
Complete and submit Labs	Sunday 11:59 PM EST/EDT
Complete Homework Case 9-1	Sunday 11:59 PM EST/EDT

## Module 6

### DNS and Configuring a Mail Server

#### Objectives

When you complete this module, you should be able to:

- Describe Domain Name System and how it relates to the Internet.
- Install and configure Berkeley Internet Name Daemon (BIND).
- Identify zones and describe the elements in a zone file.
- Explain how the different types of resource records affect zones.
- Identify key elements in the Linux e-mail architecture.
- Describe how MTAs and MUAs are used in the Linux mail system.

#### Reading

Chapters 11 and 12

Items to be Completed:	Due No Later Than:
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**Assignments**

Post an initial response to your group's discussion board	Thursday 11:59 PM EST/EDT
Post responses to at least two classmates on the opposite discussion board	Sunday 11:59 PM EST/EDT
Complete and submit Labs	Sunday 11:59 PM EST/EDT
Complete Quiz 2	Sunday 11:59 PM EST/EDT

## Module 7

### Network File Systems and Planning for a Linux Installation

#### Objectives

When you complete this module, you should be able to:

- Describe the Network File System.
- Export and import file systems with YaST system modules.
- Identify key NFS services.
- Edit NFS configuration files to export and import network file systems manually.
- Identify the hardware components in a Linux computer.
- Develop a preinstallation checklist.
- Use an automated method to install openSUSE.

#### Reading

Chapters 13 and 14

#### Assignments

Items to be Completed:	Due No Later Than:
Post an initial response to your group's discussion board	Thursday 11:59 PM EST/EDT
Post responses to at least two classmates on the opposite discussion board	Sunday 11:59 PM EST/EDT
Complete and submit Labs	Sunday 11:59 PM EST/EDT
Complete Homework Case 13-1	Sunday 11:59 PM EST/EDT

## Module 8

### Managing File Systems and Resources in Linux

#### Objectives

When you complete this module, you should be able to:

- Describe features of Linux file systems.
- Administer the Linux file system at the command line.
- Perform file system management tasks.
- Identify common X Window versions and configure X Window with Linux utilities.
- Explain how to use a display manager in KDE and GNOME.
- Manage the root user account as well as disk quotas.

#### Reading

Chapters 15 and 16

#### Assignments

Items to be Completed:	Due No Later Than:
Post an initial response to your group's discussion board	Thursday 11:59 PM EST/EDT
Post responses to at least two classmates on the opposite discussion board	Sunday 11:59 PM EST/EDT
Complete and submit Labs	Sunday 11:59 PM EST/EDT
Complete Homework Case 15-1 and 16-2	Sunday 11:59 PM EST/EDT
Complete the Final Exam	Sunday 11:59 PM EST/EDT