

# CIS 330: INTRODUCTION TO LINUX OPERATING SYSTEM

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**Originator**

fmarhuenda

**Co-Contributor(s)****Name(s)**

Flores, Martin

**Justification / Rationale**

Offer as non credit for students who do not wish to take it for credit.

**Effective Term**

Spring 2022

**Credit Status**

Noncredit

**Subject**

CIS - Computer Information Systems

**Course Number**

330

**Full Course Title**

Introduction to Linux Operating System

**Short Title**

LINUX

**Discipline****Disciplines List**

Computer Information Systems (Computer network installation, microcomputer technology, computer applications)

**Modality**

Face-to-Face

100% Online

**Catalog Description**

Introduction to the Linux operating system primarily focused on command line usage. Covers the history, kernel, file systems, shells and user utilities. Also introduces students to the fundamentals of shell programming, processes, communications, and basic security.

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Introduction to the Linux operating system primarily focused on command line usage. Covers the history, kernel, file systems, shells and user utilities. Also introduces students to the fundamentals of shell programming, processes, communications, and basic security.

**Non-credit Hours**

162

**Lecture Units**

0

**Lab Units**

0

**In-class Hours**

90

**Out-of-class Hours**

72

**Total Course Units**

0

**Total Semester Hours**

0

**Override Description**

noncredit course

**Required Text and Other Instructional Materials****Resource Type**

Book

**Open Educational Resource**

No

**Author**

Nemeth, Evi; Snyder, Garth; Hein, Trent; Whaley, Ben; Mackin, Dan

**Title**

UNIX and Linux System Administration Handbook

**Edition**

5th

**Publisher**

Addison-Wesley Professional

**Year**

2017

**Flesch-Kincaid Level**

12

**ISBN #**

978-0134277554

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**Resource Type**

Book

**Open Educational Resource**

No

**Author**

Bresnahan, Christine; Blum, Richard

**Title**

Linux Essentials

**Edition**

2nd

**Publisher**

Sybex (Wiley)

**Year**

2015

**College Level**

Yes

**Flesch-Kincaid Level**

12

**ISBN #**

978-1119092063

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**Resource Type**

Book (Recommended)

**Open Educational Resource**

No

**Author**

Ward, Brian

**Title**

How Linux Works: What Every Superuser Should Know

**Edition**

2nd

**Publisher**

No Starch Press

**Year**

2014

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**Resource Type**

Book (Recommended)

**Open Educational Resource**

No

**Author**

Hahn, Harley

**Title**

Harley Hahn's Guide to UNIX and Linux

**Edition**

1st

**Publisher**

McGraw-Hill Higher Education

**Year**

2008

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**For Text greater than five years old, list rationale:**

Harley Hahn's book is a classic in Linux instruction and still relevant. I just want to give the instruction the option of using it.

**Class Size Maximum**

35

**Course Content**

1. Overview
  - a. Brief overview of operating systems
  - b. Overview and features of Linux
  - c. Pros and cons of Linux
2. History and Philosophy
  - a. Original and current philosophies
  - b. Origin and history of Linux systems and their derivatives
  - c. Overview of Linux standards
3. Components of Linux
  - a. Kernel
  - b. Shells
  - c. Utilities
  - d. Shell command line vs. GUI
4. The kernel and its subsystems
  - a. System Call Interface, File subsystem, I/O and device subsystem
  - b. Process Control: scheduler, time slicing
  - c. Memory management: paging vs. swapping
5. Getting Started with Linux
  - a. How to log in and log out
  - b. User accounts
  - c. The superuser
  - d. Account settings and configuration
  - e. Commands for getting information
  - f. Stopping a program
6. Introduction to Linux Shells
  - a. Function of shells
  - b. Comparison of Linux shell types
  - c. Shell environment
  - d. Shell variables and environment variables
  - e. Using variables
7. More about the Shell
  - a. Meta-characters
  - b. Quoting and escaping
  - c. Built-in and external commands
  - d. Search path
  - e. Aliases
  - f. Basic shell programming functions
8. Overview of Commands
  - a. Understanding man pages
  - b. Command line syntax
  - c. Arguments and options
  - d. command line history
  - e. command line completion
  - f. command line editing
9. Filter Commands
  - a. Displaying files
  - b. Comparing files
  - c. Counting lines, words and characters
  - d. Sorting data
  - e. Selecting lines
10. The Linux Filesystem
  - a. Overview of files
  - b. inode concepts
  - c. Hardware and processes as file abstractions
  - d. Modern Linux filesystem types

- e. Hierarchical organization of filesystems
- f. Directory organization
- 11. Working with Directories and Files
  - a. Absolute and relative pathnames
  - b. Working directory
  - c. Moving about in the filesystem
  - d. Basic directory operations
  - e. Basic file operations
  - f. Permissions
  - g. Links
  - h. Finding files
- 12. Processes
  - a. Kernel management of processes
  - b. System processes vs. user processes
  - c. Foreground vs. background processes
  - d. Displaying process information
  - e. Suspending and killing processes
- 13. Regular Expressions
  - a. Introduction to regular expressions
  - b. Matching lines, words and characters
  - c. Character classes
  - d. Operators
  - e. Introduction to sed and awk
- 14. Input and Output
  - a. Standard input
  - b. Standard output and standard error
  - c. Redirection
  - d. Pipes
  - e. File descriptors
- 15. Communications
  - a. Introduction to basic utilities
  - b. Connecting to remote computers
  - c. Transferring files
- 16. Text Editors
  - a. Comparison of Linux text editors
  - b. Text editor basics
  - c. How to create, open and save a file
  - d. Editing a text file

**Course Objectives**

	<b>Objectives</b>
Objective 1	Describe the basic features of the Linux operating system.
Objective 2	Articulate the history and philosophy of Linux systems and standards.
Objective 3	Discuss the various components of Linux.
Objective 4	Create a user account, logon and get information using commands on a Linux system.
Objective 5	Compare Linux shell types and use variables in the shell environment.
Objective 6	Outline a basic shell script and demonstrate the understanding of the shell through the use of an alias and built in commands.
Objective 7	Use the man pages effectively and show proficiency in using the command line.
Objective 8	Display, count, sort and compare files using filter commands.
Objective 9	Discuss the Linux files system concepts and organization.
Objective 10	Perform directory and file operations including changing permissions, creation, deletion, moving and renaming.
Objective 11	Demonstrate an understanding of user and system processes and basic process operations.
Objective 12	Use regular expressions to effectively describe desired search patterns.

Objective 13 Write code to redirect input and output to and from the user, files and commands using redirection and pipe.

Objective 14 Connect to remote computers and transfer files using Linux commands.

Objective 15 Create and edit text files in a Linux text editor to illustrate knowledge of the text editor functions and commands.

### Student Learning Outcomes

**Upon satisfactory completion of this course, students will be able to:**

Outcome 1 Describe the various aspects of the Unix operating system from a user and administrator perspective.

Outcome 2 Perform the basic tasks of a system administrator necessary for an operational Linux environment.

### Methods of Instruction

Method	Please provide a description or examples of how each instructional method will be used in this course.
Lecture	Lectures which include history, structure and use of the Linux operating system.
Laboratory	A lab assignment web-page located on a college-hosted course management system or other department-approved Internet environment. Here, the students will review the specification of each laboratory assignment and submit their completed work.
Participation	A discussion web-page located on a college hosted course management system or other department-approved Internet environment. Here, students can request assistance from the instructor and interact publicly with other class members.
Discussion	In person or on-line discussion which engages students and instructor in an ongoing dialog pertaining to all aspects of the Linux operating system.

### Methods of Evaluation

Method	Please provide a description or examples of how each evaluation method will be used in this course.	Type of Assignment
Written homework	Multiple step-by-step homework assignments, will provide a positive learning environment where students interact with the Linux operating system and build on their skills and knowledge as they progress.	Out of Class Only
Laboratory projects	Work with students on projects that represent real world Linux computer maintenance scenarios.	In Class Only
Group activity participation/observation	Students will work on group projects that represent real world Linux system administrator tasks.	In and Out of Class
Product/project development evaluation	Class and individual skill assessment projects will cover key areas of Linux administration and installation.	In Class Only
Mid-term and final evaluations	Students will complete summative midterm and final assessments.	In Class Only
Computational/problem-solving evaluations	Students will be presented with various issues common to a Linux system admin whose solution will require they implement the material learned in class.	In and Out of Class
Presentations/student demonstration observations	Students will present to the class their results of the group projects in which they had to solve issues or provide system admin services.	In Class Only
Tests/Quizzes/Examinations	There will be regular examinations to assess student learning.	In Class Only
Written homework	Detailed review of written assignments which includes model solutions and specific comments on the student submissions.	Out of Class Only

Other	Out-of-class hours will be accounted for electronically through the learning management system.	Out of Class Only
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## Assignments

### Other In-class Assignments

- Students will complete an analysis of ongoing Case Studies from an end of chapter exercise in the textbook to apply operating systems principles
- Apply critical thinking to a Situation Analysis scenario given in the text book.
- Students will complete projects and case studies designed to implement and troubleshoot operating systems in use today.

### Other Out-of-class Assignments

- Students will be assigned readings from the textbook and from the Learning Modules on the website.
- Every end of chapter section includes an ongoing Case Study which will be assigned.
- Writing technical prose documentation that supports and describes the assignments that are submitted for grades.

## Grade Methods

Pass/No Pass Only

## Distance Education Checklist

### Lab Courses

#### How will the lab component of your course be differentiated from the lecture component of the course?

The lab component will be focused around student activities performed on their Linux OS that are based on the lecture. They will then turn in different types of proof of completion of those activities.

#### From the COR list, what activities are specified as lab, and how will those be monitored by the instructor?

Getting started with Linux, Using basic commands, Exploring various environment and shell variables in the Linux operating system, Communicating with remote computers. The instructor will require some type of proof of completion of these activities (output, screenshot, etc.)

#### How will you assess the online delivery of lab activities?

We will base our assessment of these online activities on student evaluation, student retention, efficiency, and effectiveness.

## Instructional Materials and Resources

#### If you use any other technologies in addition to the college LMS, what other technologies will you use and how are you ensuring student data security?

We MAY be using McGraw-Hill's online system for this course. We are not sure yet as I have not had a chance to fully evaluate it.

#### If used, explain how specific materials and resources outside the LMS will be used to enhance student learning.

Their LMS contains various lab activities followed by similar activities which they are to complete. The activities also contain videos that explain the process in detail.

## Effective Student/Faculty Contact

#### Which of the following methods of regular, timely, and effective student/faculty contact will be used in this course?

##### Within Course Management System:

Chat room/instant messaging  
Discussion forums with substantive instructor participation  
Online quizzes and examinations  
Private messages  
Regular virtual office hours  
Timely feedback and return of student work as specified in the syllabus  
Video or audio feedback  
Weekly announcements

##### External to Course Management System:

Direct e-mail

E-portfolios/blogs/wikis  
Posted audio/video (including YouTube, 3cm mediasolutions, etc.)  
Synchronous audio/video  
Teleconferencing  
Telephone contact/voicemail

**Briefly discuss how the selected strategies above will be used to maintain Regular Effective Contact in the course.**

There will be weekly discussions regarding topics related to the course with appropriate instructor participation. Students will create logs describing the process to diagnose an issue. These logs are uploaded to the LMS and receive appropriate instructor feedback.

**If interacting with students outside the LMS, explain how additional interactions with students outside the LMS will enhance student learning.**

The CMS for McGraw-Hill contains videos and simulations that further learning.

## **Other Information**

### **MIS Course Data**

**CIP Code**

11.0103 - Information Technology.

**TOP Code**

070100 - Information Technology, General

**SAM Code**

C - Clearly Occupational

**Basic Skills Status**

Not Basic Skills

**Prior College Level**

Not applicable

**Cooperative Work Experience**

Not a Coop Course

**Course Classification Status**

Non-Enhanced Funding

**Approved Special Class**

Not special class

**Noncredit Category**

Workforce Preparation

**Funding Agency Category**

Not Applicable

**Program Status**

Stand-alone

**Transfer Status**

Not transferable

**General Education Status**

Y = Not applicable

**Support Course Status**

N = Course is not a support course



**Allow Audit**

Yes

**Repeatability**

Yes

**Repeatability Limit**

NC

**Repeat Type**

Noncredit

**Justification**

Noncredit

**Materials Fee**

No

**Additional Fees?**

No

**Approvals****Curriculum Committee Approval Date**

4/15/2021

**Academic Senate Approval Date**

4/22/2021

**Board of Trustees Approval Date**

05/21/2021

**Chancellor's Office Approval Date**

07/22/2021

**Course Control Number**

CCC000626166