

SAN DIEGO COMMUNITY COLLEGE DISTRICT  
CONTINUING EDUCATION  
COURSE OUTLINE

**SECTION I**

**SUBJECT AREA AND COURSE NUMBER**

COMP 641

**COURSE TITLE**

LINUX ESSENTIALS

**TYPE COURSE**

NON-FEE

VOCATIONAL

**CATALOG COURSE DESCRIPTION**

This course includes the installation, configuration, and the management of the Linux Operating System. Students will learn about command line processing, user accounts and permissions, and basic shell programming. Students will be introduced to the history of Linux and the open source community, and the different distributions of Linux currently available.  
(FT)

**LECTURE/LABORATORY HOURS**

120

**ADVISORY**

Microcomputer Basics or equivalent.

**RECOMMENDED SKILL LEVEL**

Possess a 10<sup>th</sup> grade reading level; ability to communicate effectively in the English language; knowledge of math concepts at the 8<sup>th</sup> grade level and basic computer literacy.

**INSTITUTIONAL STUDENT LEARNING OUTCOMES**

1. Social Responsibility  
SDCE students demonstrate interpersonal skills by learning and working cooperatively in a diverse environment.
2. Effective Communication  
SDCE students demonstrate effective communication skills.

### INSTITUTIONAL STUDENT LEARNING OUTCOMES (CONTINUED)

3. Critical Thinking  
SDCE students critically process information, make decisions, and solve problems independently or cooperatively.
4. Personal and Professional Development  
SDCE students pursue short term and life-long learning goals, mastering necessary skills and using resource management and self-advocacy skills to cope with changing situations in their lives.

### COURSE GOALS

1. Introduce the Linux Operating System environment.
2. Learn the different distributions of Linux.
3. Have a basic understanding of files and directories.
4. Learn how to use permission and ownership to secure files and directories.
5. Understand what shells are and how they relate to the overall system.
6. Learn command line basics.
7. Understand and use basic shell programming.

### COURSE OBJECTIVES

Upon successful completion of this course, the student will be able to:

1. Describe and use the different distributions of Linux.
2. Demonstrate installation and upgrade of Linux Operating System.
3. Demonstrate managing network configuration.
4. Describe the Linux file system and manage system processes.
5. Demonstrate how to create and alter directories and files.
6. Describe the purpose of a shell and how they relate to the overall system.
7. Demonstrate basic shell programming.
8. Demonstrate command line basics.

## **SECTION II**

### COURSE CONTENT AND SCOPE

1. A Career in Open Source and Joining the Linux Community
  - 1.1. Linux evolution and popular operating systems
    - 1.1.1. Open source philosophy
    - 1.1.2. Distributions
    - 1.1.3. Embedded systems
  - 1.2. Major open source applications
    - 1.2.1. Desktop applications
    - 1.2.2. Server applications
    - 1.2.3. Mobile applications
    - 1.2.4. Development languages

COURSE CONTENT AND SCOPE (CONTINUED)

- 1.2.5. Package management tools and repositories
- 1.3. Open Source Software and Licensing
  - 1.3.1. Licensing
  - 1.3.2. Free Software Foundation (FSF)
  - 1.3.3. Open Source Initiative (OSI)
- 1.4. Information and Communication Technology (ICT) Skills and Linux
  - 1.4.1. Desktop skills
  - 1.4.2. Command line
  - 1.4.3. Industry uses of Linux, cloud computing and virtualization
- 2. Linux Basics
  - 2.1. Command line basics
    - 2.1.1. Basic shell
    - 2.1.2. Command format
    - 2.1.3. Options
    - 2.1.4. Variables
    - 2.1.5. Globbing
    - 2.1.6. Quoting
  - 2.2. Command Line to Get Help
    - 2.2.1. Man
    - 2.2.2. Info
  - 2.3. Directories and files
    - 2.3.1. Use directory commands
    - 2.3.2. List file commands
    - 2.3.3. Hidden files and directories
    - 2.3.4. Home
    - 2.3.5. Absolute and relative paths
  - 2.4. Create, move, and delete files
    - 2.4.1. Files and directories
    - 2.4.2. Case sensitivity
    - 2.4.3. Simple globbing and quoting
- 3. Command Line
  - 3.1. Archiving files on the command line
    - 3.1.1. Files and directories
    - 3.1.2. Archives and compression
  - 3.2. Search and extract data from files
    - 3.2.1. Command line pipes
    - 3.2.2. I/O re-direction
  - 3.3. Scripts
    - 3.3.1. Basic text editing
    - 3.3.2. Basic shell scripting
- 4. Linux Operating System Components
  - 4.1. Operating system selection
    - 4.1.1. Windows, Mac, Linux differences
    - 4.1.2. Distribution life cycle management
  - 4.2. Computer Hardware
    - 4.2.1. Hardware

COURSE CONTENT AND SCOPE (CONTINUED)

- 4.3. File System
  - 4.3.1. Kernel
  - 4.3.2. Processes
  - 4.3.3. syslog, klog, dmesg
  - 4.3.4. /lib, /usr/lib, /etc, /var/log
- 4.4. Network
  - 4.4.1. Internet, network, routers
  - 4.4.2. Domain Name Service
  - 4.4.3. Network configuration
- 5. Security and File Permissions
  - 5.1. Basic security and user types
    - 5.1.1. Root account
    - 5.1.2. Standard users
    - 5.1.3. System users
  - 5.2. Users and groups
    - 5.2.1. User and group commands
    - 5.2.2. User IDs
  - 5.3. File permissions and ownership
    - 5.3.1. File permissions
    - 5.3.2. Directory permissions
    - 5.3.3. File ownership
    - 5.3.4. Directory ownership
  - 5.4. Special directories and files
    - 5.4.1. System files
    - 5.4.2. System libraries
    - 5.4.3. Symbolic links

APPROPRIATE READINGS

Appropriate readings may include, but are not limited to, periodicals, magazines, instructor-written materials, manuals, instructor selected URLs, and publications related to the implementation of desktop operating systems.

WRITING ASSIGNMENTS

Appropriate writing assignments may include, but are not limited to, preparing text for an assigned project, keeping a journal on all laboratory and project work, and completing all assigned reports.

OUTSIDE ASSIGNMENTS

Outside assignments may include, but are not limited to, reading texts and reference resources; research as needed to complete projects; and organizing and preparing written answers to assigned questions.

### APPROPRIATE ASSIGNMENTS THAT DEMONSTRATE CRITICAL THINKING

Assignments which demonstrate critical thinking may include, but are not limited to, analysis and evaluation of assigned text and reference resources, and utilize this analysis in classroom discussions, writing assignments, and in performing laboratory activities. Students must select and use appropriate methods and resources to complete laboratory assignments.

### EVALUATION

A student's grade will be based on multiple measures of performance and will include evaluation of student's ability to:

1. Perform in a variety of activities and assignments.
2. Complete written and practical examinations.
3. Contribute to class and group discussions.
4. Maintain attendance and punctuality per current policy.
5. Demonstrate ability to work independently and as a team member.

Upon successful completion of each course in the program, a Certificate of Course Completion will be issued. Upon successful completion of both courses included in the program, a Certificate of Program Completion will be issued.

### METHOD OF INSTRUCTION

Methods of instruction may include, but are not limited to, lectures, discussion, hands-on demonstrations, computer-assisted instruction, laboratory assignments and field trips. This course, or sections of this course, may be offered through distance education.

### TEXTS AND SUPPLIES

*Linux Essentials*, Roderick W. Smith, John Wiley & Sons, Inc., current edition  
*Linux+ Guide to Linux Certification*, Jason W. Eckert, Cengage Learning, current edition  
*Linux Bible: The Comprehensive, Tutorial Resource*, Christopher Negus, John Wiley & Sons, Inc., current edition

Web Resources: <http://www.lpi.org/>; <http://www.linux.org/>; <https://gnu.org/>; <http://www.fsf.org/>;  
<http://fedoraproject.org/>; <http://www.ubuntu.com/>

Supplies: Journal (composition book), USB Drive or other storage media

PREPARED BY: Richard Gholson DATE: 10/31/2014

REVISED BY: Richard Gholson DATE: 12/6/16

Instructors must meet all requirements stated in Policy 3100 (Student Rights, Responsibilities and Administrative Due Process), and the Attendance Policy set forth in the Continuing Education Catalog.

### REFERENCES:

San Diego Community College District Policy 3100  
California Community Colleges, Title 5, Section 55002  
Continuing Education Catalog