Course ID: CNIT R143
Curriculum Committee Approval Date: 10/25/2017
Catalog Start Date: Fall 2018

COURSE OUTLINE

OXNARD COLLEGE

I. Course Identification and Justification:

A. Proposed course id: CNIT R143
Banner title: CompTIA Linux+ Fundamentals
Full title: CompTIA Linux+ Fundamentals and Certification Preparation

Previous course id: CNIT R143
Banner title: CompTIA Linux+ Fundamentals
Full title: CompTIA Linux+ Fundamentals and Certificate Preparation

B. Reason(s) course is offered:
Due to the surge in popularity of the Linux operating system, this course is offered to meet the employment demands of the computer networking/IT industry.

C. Reason(s) for current outline revision:
5-year update

D. C-ID:
1. C-ID Descriptor:
2. C-ID Status: Not Applicable

E. Co-listed as:
Current: None
Previous:

II. Catalog Information:

A. Units:
Current: 3.00
Previous: 3.00

B. Course Hours:
1. In-Class Contact Hours: Lecture: 43.75 Activity: 0 Lab: 26.25
2. Total In-Class Contact Hours: 70
3. Total Outside-of-Class Hours: 87.5
4. Total Student Learning Hours: 157.5

C. Prerequisites, Corequisites, Advisories, and Limitations on Enrollment:
1. Prerequisites
Current:
Previous:

2. Corequisites
Current:
Previous:

3. Advisories:
   Current:
   Previous:

4. Limitations on Enrollment:
   Current:
   Previous:

D. Catalog description:
Current:
This course provides instruction and hands-on training on the Linux operating system. Students will gain an understanding of an open-source operating system, perform a Linux installation, administer user accounts, configure file settings, and customize settings of the operating system. The course will also cover networking with Linux, security issues, and interoperability with other operating systems. In addition, this course prepares students for the CompTIA Linux+ certification. CompTIA certification voucher discounts are available to Oxnard College CNIT students.

Previous, if different:
This course provides instruction and hands-on training on the Linux operating system. Students will gain an understanding of an open-source operating system, perform a Linux installation, administer user accounts and file settings, and customize settings of the operating system. The course will also cover networking with Linux, security issues, and interoperability with other operating systems. In addition, this course prepares students for the CompTIA Linux+ certification. Certification voucher discounts are available to Oxnard College students.

E. Fees:
Current: $ None
Previous, if different: $

F. Field trips:
Current:
Will be required: [ ]
May be required: [X]
Will not be required: [ ]

Previous, if different:
Will be required: [ ]
May be required: [ ]
Will not be required: [ ]

G. Repeatability:
Current:
A - Not designed as repeatable
Previous:
1 -

H. Credit basis:
Current:
Letter graded only [X]
Pass/no pass [ ]
Student option [ ]

Previous, if different:

Letter graded only [ ]
Pass/no pass [ ]
Student option [ ]

I. Credit by exam:
Current:
Petitions may be granted: [X]
Petitions will not be granted: [ ]

Previous, if different:
Petitions may be granted: [ ]
Petitions will not be granted: [ ]

III. Course Objectives:
Upon successful completion of this course, the student should be able to:
- A. Explain the difference between an open-source operating system and a proprietary operating system.
- B. Analyze issues related to selecting an open-source operating system and list the issues related to providing support for the Linux operating system.
- C. Install the Linux operating system and determine system requirements for installation.
- D. Manage user accounts and the Linux file system.
- E. Configure client network services and settings such as TCP/IP.
- F. Define security terms and implement security settings in the Linux operating system.
- G. Monitor system performance and document maintenance and troubleshooting.
- H. Identify protocols that enable Linux to be interoperable with other operating systems.

IV. Student Learning Outcomes:
- A. Students will summarize the differences between Linux distributions, desktops, and presentation managers.
- B. Students will demonstrate proper use of the tools for managing Linux and open source software maintenance
- C. Students will change command behavior using cli switches, redirect output to a file, and use the output of one command as input to another which is called piping.

V. Course Content:
Topics to be covered include, but are not limited to:
- A. Open-source versus proprietary operating systems
  1. Popularity
  2. Licensing issues
  3. Costs
  4. Support Issues
- B. Linux installation
  1. System resources and hardware requirements
  2. Installation methods
     a. Boot disk
     b. CD-ROM
     c. USB
     d. Network

3. Optional installation parameters
4. File system options
    a. Ext2
    b. Ext3
    c. Reiser
5. Peripheral support and driver issues

C. Management
1. File system management using command line utilities
    a. Fsck
    b. Fdisk
    c. Mkfs
2. File system compatibility options with other operating systems
3. User account management
4. Command line interface (CLI) management of file system and user accounts
5. Graphic user interface (GUI) management of file system and user accounts

D. Network services
1. TCP/IP settings
2. Routing and subnetting
3. Linux printing
4. SAMBA and Apache

E. Security
1. Linux Intrusion Detection System (IDS)
2. Data security and encryption
3. IP and port security
4. Password policy and security
5. Security auditing and logging

F. Documentation
1. Baseline measurements
2. Written procedures
    a. Installation
    b. Configuration
    c. Security
    d. Management
3. Linux documentation resources and help files
4. Best practices for recording trouble tickets

VI. Lab Content:

A. Install Linux OS on a Client
1. Determine system resources needed
2. Utilize a boot disk
3. Install from a CD/DVD
4. Install from USB
5. Install from network

B. Manage the File System
1. Format the drive
2. Configure the various EXT file systems
3. Use the command line interface (CLI) to manage the file system
4. Use the graphic user interface (GUI) to manage the file system
5. Secure the file system

C. Configure Network Services
1. Configure IP address settings
2. Configure TCP/IP settings
3. Network Linux clients together to form a LAN

4. Implement printing on a Linux network

D. User Accounts
   1. Configure user accounts utilizing Linux
   2. Apply appropriate permissions for user accounts
   3. Implement a strong password policy for Linux user accounts

E. Security
   1. Implement Linux intrusion detection system (IDS)
   2. Implement data security and encryption
   3. Reduce the attack surface by disabling non-essential ports and protocols.
   4. Update the Linux OS with the latest patches and drivers
   5. Analyze network communication utilizing a protocol analyzer

VII. Methods of Instruction:

Methods may include, but are not limited to:

A. Lectures by instructor on topics including but not limited to installing, managing, configuring, and troubleshooting the Linux operating system.

B. Hands-on labs some of which will be completed individually and some of which will be completed in team pairs on installing Linux, managing user accounts and file systems, configuring network services, and performing troubleshooting using command line utilities and system help.

VIII. Methods of Evaluation and Assignments:

A. Methods of evaluation for degree-applicable courses:
   Essays [X]
   Problem-solving assignments (Examples: Math-like problems, diagnosis & repair) [X]
   Physical skills demonstrations (Examples: Performing arts, equipment operation) [X]

   For any course, if "Essays" above is not checked, explain why.

B. Typical graded assignments (methods of evaluation):
   1. Exams and quizzes on course topics including but not limited to identifying various flavors of Linux and the benefits of each, installation parameters, file system types, network protocols used by Linux, security and encryption, password policies, and documentation.
   2. Homework assignments that measure the knowledge of a student gained from presentations, discussions, and reading assignments from the textbook.
   3. Lab assignments that demonstrate the ability of a student to install Linux, manage user accounts, manage a file system, configure passwords, manage network protocols, and implement security measures.
   4. Group work performing research on Linux related topics such as new versions of Linux coming to the market, industry statistics and trends on Linux acceptance, updates and fixes to known bugs in the operating system. Students will be required to document the research and share the information with other team members and potentially the class.
   5. Short essays at the conclusion of specific lab activities.

C. Typical outside of classroom assignments:
   1. Reading
      a. Students are required to read and study the information in the assigned chapter of the textbook in between classes in order to be prepared for the lecture and classroom activities. Examples of unit topics that

students will be assigned to read are file system management, user and group administration, security, and troubleshooting of the Linux environment.

b. Students are required to perform reading from assigned Linux support websites such as www.redhat.com, www.ubuntu.com, and www.suse.com.

2. Writing
   a. Students are required to write reports on their analysis of articles they are assigned to read on the Internet on topics assigned by the instructor including new versions of Linux coming to the market and current security updates for the operating system.
3. Other
   a. In order to be prepared for the CompTIA Linux+ Certification and the course final, students will be required to answer certification preparation questions from the CD that comes with the book. Students will also be required to take a simulated certification preparation exam to help ensure their readiness for the actual course final and the Linux+ certification.

IX. Textbooks and Instructional Materials:

A. Textbooks/Resources:
   1. Bresnahan, C (2015). *CompTIA Linux+ Study Guide* (3rd/e). Sybex.

B. Other instructional materials:
   1. Linux Operating System
   2. MeasureUP Linux + Exam preparation software (included with book)

X. Minimum Qualifications and Additional Certifications:

A. Minimum qualifications:
   1. Computer Information Systems

B. Additional certifications:
   1. Description of certification requirement:
      CompTIA Linux + Certification
   2. Name of statute, regulation, or licensing/certification organization requiring this certification:
      CompTIA

XI. Approval Dates

Curriculum Committee Approval Date: 10/25/2017
Board of Trustees Approval Date: 10/25/2017
State Approval Date: 01/09/2018
Catalog Start Date: Fall 2018

XII. Distance Learning Appendix

A. Methods of Instruction

Methods may include, but are not limited to:

1. A VCCCD approved learning management system (LMS) will be utilized to facilitate synchronous and asynchronous communication which includes but is

not limited to the following: Live chat, asynchronous discussion forums, direct messages, grading assignments and providing feedback to students regarding performance on the assignments. The instructor may also utilize the LMS to provide course progress updates.

B. Information Transfer

Methods may include, but are not limited to:

1. Chat/IM
2. Course announcements
3. Discussion boards
4. E-Mail
5. Instructor-provided online materials
6. Messaging via the LMS
7. Modules on the LMS
8. Personalized feedback
9. Textbooks