



# Broward Community College

## Course Outline

STATUS:   A  

COMMON COURSE NUMBER:   CTS1301C  

COURSE TITLE:   Linux Networking  

CREDIT HOURS:           4          

**CONTACT HOURS BREAKDOWN:**

Lecture/Discussion           56          

Lab                   8          

Other                           

Contact Hours/Week           4          

**CATALOG COURSE DESCRIPTION:**

This course covers common networking services, while providing an in-depth understanding of Linux and GNU network-related packages. It covers common services such as Apache, ssh, telnet, ftp, and sendmail; and provides a detailed walk-through of network configuration using console tools such as ifconfig, insmod, and route, as well as common GUI tools. This course also reviews network architectures and topologies, including the standard protocols. The skills developed by students completing this course (in combination with CEN1881C, CEN1882C, and CEN1884C) will help prepare them for the Sair Linux & GNU Level 1 and LPI Level 1 certification exams.

Prerequisite: CTS1321C

Corequisite:

**UNIT TITLES:**

1. Network Topologies, Interfaces, and Protocols
2. Using TCP/IP
3. Network Configuration Tools
4. Domain Name System (DNS)
5. Network Security
6. File and Printer Sharing and Directory Services
7. Mail Services
8. Web, FTP, and News Services
9. Other Network Services
10. Network Troubleshooting and Optimization

LAST REVIEW \_\_\_\_\_  
*Interim Revision Dates:*

NEXT REVIEW   Academic Year 2008-09

## **I. Course Overview:**

Upon successful completion of this course, the students should be able to describe network architectures and administer Linux systems in a network environment.

## **II. Units:**

### **Unit 1. Network Topologies, Interfaces, and Protocols**

#### General Outcome:

1.0 The student should be able to identify different networking topologies; understand the capabilities and limitations of different types of networks; identify a network interface; discuss the purpose of having protocols; and identify common protocols in use today.

#### Specific Learning Outcomes:

Upon successful completion of this unit, the students should be able to:

- 1.1 Identify the different networking topologies.
- 1.2 Identify IEEE 802 Categories.
- 1.3 Discuss the most commonly used networking protocols.
- 1.4 Describe what an interface is; and describe what type of connector is used with which network topology.
- 1.5 Describe the function of the OSI model.
- 1.6 Understand the Linux networking stack.

**Unit 2. Using TCP/IP**

General Outcome:

2.0 The student should be able to identify what the TCP/IP protocol does; describe an IP address, subnet mask and gateway; and subnet and aggregate network addresses.

Specific Learning Outcomes:

Upon successful completion of this unit, the students should be able to:

- 2.1 Identify the network and host portions of the IP address.
- 2.2 Understand the relationship of the subnet mask to the IP address.
- 2.3 Understand what a gateway is.
- 2.4 Subnet a network address.
- 2.5 Supernet a network address.

**Unit 3. Network Configuration Tools**

General Outcome:

3.0 The student should be able to configure their network settings using common Linux networking tools.

Specific Learning Outcomes:

Upon successful completion of this unit, the students should be able to:

3.1 Locate network configuration files.

3.2 Use the commands to configure their IP settings statically.

3.3 Assign a computer a hostname.

3.4 Add and remove to static routes to the routing table.

3.5 Configure the system to be a DNS and DHCP client.

**Unit 4. Domain Name System (DNS)**

General Outcome:

4.0 The student should be able to configure a DNS Server.

Specific Learning Outcomes:

Upon successful completion of this unit, the students should be able to:

- 4.1 Understand the concept of a name space.
- 4.2 Discuss what BIND is and which organization supports it.
- 4.3 Start and stop the named daemon; and configure named daemon to start at boot.
- 4.4 Identify the structure of the named configuration file and the zone files.
- 4.5 Create and configure the named configuration file and the zone files.

**Unit 5. Network Security**

General Outcome:

5.0 The student should be able discuss Linux security and identify the causes of security lapses.

Specific Learning Outcomes:

Upon successful completion of this unit, the students should be able to:

5.1 Discuss the security vulnerabilities with users and administrators.

5.2 Discuss the security vulnerabilities with software bugs.

5.3 Identify "open doors" created by insecure software programs.

5.4 Discuss security problems in the /etc/passwd and /etc/shadow files.

5.5 Identify improperly set file permissions.

5.6 Discuss common sense security issues.

General Outcome:

- 6.0 The student should be able to setup a directory service server, and share files and printers.

Specific Learning Outcomes:

Upon successful completion of this unit, the students should be able to:

- 6.1 Setup a Network File Server.
- 6.2 Manually mount a remote share on local system; and automatically mount a remote share at boot.
- 6.3 Understand the structure of the export file.
- 6.4 Setup a directory service server.
- 6.5 Setup client computer to authenticate to the directory service server.

**Unit 7. Mail Services**

General Outcomes:

7.0 The student should be able to implement a mail server and setup mail clients for the users.

Specific Learning Outcomes:

Upon successful completion of this unit, the students should be able to:

7.1 Understand the concept of how email works.

7.2 Understand SMTP, IMAP and POP protocols.

7.3 Understand the relationship between email and DNS.

7.4 Install the sendmail mail service.

7.5 Configure sendmail.

7.6 Configure Pine, the email client.

**Unit 8. Web, FTP, and News Services**

General Outcomes:

8.0 The student should be able to setup an Apache web server, configure WU-ftp server software, and setup News Feeds.

Specific Learning Outcomes:

Upon successful completion of this unit, the students should be able to:

- 8.1 Understand the HTTP, FTP and NNTP protocols.
- 8.2 Start and stop the httpd, innd, and wu-ftpd; and configure these daemons to start automatically on boot.
- 8.3 Locate the configuration files for Apache, Inn and WU-ftp; and understand the structure of these files.

## Unit 9. Other Network Services

### General Outcomes:

9.0 The student should be able to setup a DHCP server, configure an NIS server, and setup NIS clients.

### Specific Learning Outcomes:

Upon successful completion of this unit, the students should be able to:

- 9.1 Start and stop the dhcpd; and configure this daemon to start automatically on boot.
- 9.2 Locate the dhcp.conf file; understand the structure of the file; and edit the file to suit the environment.
- 9.3 Configure the client to automatically receive its IP settings from the DHCP server.
- 9.4 Understand the Network Information Service (NIS).
- 9.5 Understand the concept of a name space.
- 9.6 Locate the yp.conf file; understand the structure of the file; and edit the file to suit the environment.
- 9.7 Start and stop the ybind; and configure this daemon to start automatically on boot.
- 9.8 Create NIS maps.
- 9.9 Setup NIS clients.

**Unit 10. Network Troubleshooting and Optimization**

General Outcome:

10.0 The student should be able to diagnose network problems and improve network performance.

Specific Learning Outcomes:

Upon successful completion of this unit, the students should be able to:

10.1 Perform fault detection for networks, gateways, and critical servers.

10.2 Identify schemes for notifying an administrator of problems.

10.3 Perform general monitoring, to balance load and plan expansion.

10.4 Document and visualize of the network.

10.5 Administer of network devices from a central site.