Modesto Junior College
Course Outline of Record

CMPSC 210

I. **OVERVIEW**
The following information will appear in the 2010 - 2011 catalog

**CMPSC 210 Unix/Linux Administration** 3 Units

**Prerequisite:** Satisfactory completion of CMPSC 206.

This course guides students through the fundamental responsibilities of advanced UNIX/Linux system administration. Topics include file system monitoring, file and directory archiving, user account management, shutdown and rebooting sequences, system backups, system log responsibilities, system security and, configuration, monitoring and implementation of Web/DNS/Mail servers. Projects focus on the creation of shell scripts to automate system administration tasks. The course requires hands-on projects and scenario-based learning.

Field trips might be required. (A-F or P/NP - Student choice) Lecture /Lab

Transfer: (CSU, UC)

II. **LEARNING CONTEXT**
Given the following learning context, the student who satisfactorily completes this course should be able to achieve the goals specified in Section III, Desired Learning:

A. **COURSE CONTENT**

1. **Required Content:**

   a. Preparing for Linux Installation
      
      i. partition sizing and adjustments

   b. Linux installation
      
      i. CDROM install
      ii. Network install
      iii. ftp install

   c. Linux Filesystems
      
      i. exts4 vs jfs

   d. Storage Management
      
      i. logical volume managers
      ii. software vs hardware RAID

   e. Filesystem Administration
      
      i. fsck, defrag
f. Advanced Installation
   i. unattended install
   ii. automated install

g. X windows
   i. KDE
   ii. Gnome
   iii. others

h. System processes
   i. how to handle parent/child/zombies/orphan processes

i. Backup/Restore
   i. Dump/Restore
   ii. tar
   iii. cpio

j. Troubleshooting and Performance

k. Network configuration

l. Services
   i. Web server
   ii. Mail server
   iii. DNS server

m. Security

2. **Required Lab Content:**

   In lab, students perform the functions listed in the lecture content section. Assignments are given that require application of the content.

   a. Preparing for Linux Installation
      i. partition sizing and adjustments

   b. Linux installation
      i. CDROM install
      ii. Network install
iii. ftp install

c. Linux Filesystems
   i. exts4 vs jfs

d. Storage Management
   i. logical volume managers
   ii. software vs hardware RAID

e. Filesystem Administration
   i. fsck, defrag

f. Advanced Installation
   i. unattended install
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k. Network configuration

l. Services
   i. Web server
   ii. Mail server
   iii. DNS server

m. Security
B. **ENROLLMENT RESTRICTIONS**

1. **Prerequisites**
   Satisfactory completion of CMPSC 206.

2. **Requisite Skills**
   *Before entering the course, the student will be able to:*
   a. Describe UNIX shells, commands, and the UNIX file system
   b. Explain the role of UNIX system administrator and ordinary users

C. **HOURS AND UNITS**

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<th>INST METHOD</th>
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<th>UNITS</th>
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<tbody>
<tr>
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<tr>
<td>Lab</td>
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<tr>
<td>Disc</td>
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D. **METHODS OF INSTRUCTION (TYPICAL)**

*Instructors of the course might conduct the course using the following method:*

1. Reading, lecture, and discussion
2. Hands-on experience in laboratory exercises
3. Practical experience with actual system administration tasks
4. Demonstration of comparisons of methods in the handling of system administration tasks
5. Demonstration of analyses and evaluations of tools and techniques used
6. Laboratory exercises based on problem based scenarios, facilitated by instructor.

E. **ASSIGNMENTS (TYPICAL)**

1. **EVIDENCE OF APPROPRIATE WORKLOAD FOR COURSE UNITS**
   *Time spent on coursework in addition to hours of instruction (lecture hours)*
   - Weekly lab assignments and projects
   - Weekly quizzes and review questions
   - Chapter Exams and projects

2. **EVIDENCE OF CRITICAL THINKING**
   *Assignments require the appropriate level of critical thinking*
   a. Final Project
      i. Given a typical small business scenerio
         a. Install and configure a Linux server
         b. Add users
         c. Create/configure a database server
d. Create/configure a webserver

e. Create/configure a DNS server

f. Create/configure a VPN server

g. Create/configure a e-mail server

h. Configure networking

i. Create web forms and reports

F. TEXTS AND OTHER READINGS (TYPICAL)


III. DESIRED LEARNING

A. COURSE GOAL

As a result of satisfactory completion of this course, the student should be prepared to:

provide installation, operation, management, configuration, security, troubleshooting and basic UNIX/Linux hardware services for the UNIX/Linux operating system on workstations and servers.

B. STUDENT LEARNING GOALS

Mastery of the following learning goals will enable the student to achieve the overall course goal.

1. Required Learning Goals

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

a. Linux overview / review

b. Linux installation and usage

c. Filesystems

d. Storage Management (logical volume managers)

e. Filesystem administration

f. Advanced installation

g. Bash Shell scripting

h. X window managers

i. Common administration tasks

j. Backup/Restore

k. Performance and troubleshooting

l. Network configuration

m. Network Services (http, smtp, dns) and security
2. **Lab Learning Goals**

Upon satisfactory completion of the lab portion of this course, the student will be able to:

a. Explain the use of Linux in a typical IT department
b. Install Linux and explain typical usage
c. Create and monitor mount points and filesystems
d. Implement advanced Linux installations using network install configuration tools.
e. Create shell scripting tools for monitoring and system notifications
f. Describe, configure, and demonstrate various X window managers
g. Describe and implement common administration tasks
h. Evaluate and use the various Backup/Restore utilities.
i. Define and configure network configuration for both IPV4 and IPV6.
j. Install, monitor, and implement Network Services such as HTTP, DNS, and SMTP

IV. **METHODS OF ASSESSMENT (TYPICAL)**

A. **FORMATIVE ASSESSMENT**

1. Assignments
2. Exams/Quizzes
3. Projects/Labs

B. **SUMMATIVE ASSESSMENT**

1. Assignments
2. Exams/Quizzes
3. Projects/Labs