

## NET 260-81 Linux/Unix Systems Admin I Course Syllabus

### Contact Information

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### Course Information

**Course Title** Linux/Unix Systems Admin I

**Course Number** NET 260-81

This course will introduce the student to some of the key components of the Linux/UNIX operating system. The student will obtain a working knowledge of the Linux operating system. The student will also become familiar with the selection criteria for Linux/UNIX as an alternative (or cooperative) operating environment in the business world. Subject matter is reinforced by hands-on laboratory exercises and assignments.

Outline:

### Course Description

- History and overview of Linux/UNIX including historical context
- Linux operating system server configuration installation
- Configuration of the GNOME, KDE, and X-Windows GUI, and the command shell
- Learn and use common Linux/UNIX commands
- Implement user accounts and perform user administration tasks
- Create user and system-wide scripts
- Implement system utilities, performance monitoring and tuning tools, and security measures
- Configure and secure key Internet and intranet services, such as name service, file transfer, Web, e-mail, host configuration, and Windows file and print sharing

**Course Date** 09/02/07 - 12/18/07

**Prerequisite(s)** NET-102 NET-130 NET-140

### Student Learning Outcomes

- Compare and contrast Linux and UNIX, and cite relative advantages and disadvantages of the different implementations.
- Select appropriate hardware for the installation of the operating system.
- Install and configure the following key services and applications: File Transfer Protocol (FTP), Apache Web Server, SAMBA file and print services for Microsoft Windows, Network File System (NFS), and the Sendmail client and server applications.
- Distinguish the differences between using the command language interface versus using more automated Graphical based tools (including tools available from third party vendors).
- Determine (through a wide array of available resources) the mechanisms for which technical support can be obtained ranging from general questions to the resolution of complex technical issues.

- Per site requirements, demonstrate the ability to:
  - Install the operating system and server software
  - Add user accounts and groups & directory structure
  - Prepare logon scripts
  - Assign file permissions to users and groups
  - Set up network printers
  - Set up a Linux system to employ Windows file and print sharing
  - Manage applicable TCP/IP-based Internet/intranet services
  - Discuss security from the perspectives of:
    - Operating system vulnerabilities
    - Operating system security features
    - Operating system security tools from third-party vendors
    - Sources of security information and tools
- Install and configure the following key services and applications: File Transfer Protocol (FTP), Apache Web Server, SAMBA file and print services for Microsoft Windows, Network File System (NFS), and the Sendmail client and server applications.

#### Textbook, Software and System Requirements

- Hudson, Andrew and Hudson, Paul, *Fedora Unleashed*, Sams Publishing, 2008.
- *Linux Platform* – Students will need to have access to a Linux based system running the Fedora 8 operating system. There are a number of options available for setting up a system including:
  - *Standalone Workstation* - You can install you copy of *Fedora 8* on most intel based PCs. It will run on most X86 processors, so if you have an old PC available it will probably install successfully. This machine will need to be connected to a the same network that your Windows machine and the Internet are connect to.
  - *VMware Workstation* - Champlain College is a member of the VMware Academic Program. This means that you can obtain a fully licensed version of VMWare Workstation at no cost. Click the link below to go to the VMware website and download an evaluation copy of the latest version of VMware Workstation for Windows:

<http://www.vmware.com/products/ws/>

Then unlock the product by entering the following serial number:

A800M-2MG4V-V0QEQ-49HC8

- *Other Virtual Machine Products* - There are a number of other products available including the free Microsoft Virtual PC 2007 (<http://www.microsoft.com/windows/products/winfamily/virtualpc/default.mspx>). Champlain College does not not test or support these products, so students will need to use other support systems or rely on themselves for assistance.
- System Requirements - Students must have a system with a DVD-ROM, a minimum of 512MB memory for virtual machine systems, and at least 20GB of free disk space. In addition, it is preferred that students have a broadband network connection with a non-wireless NIC. You must have a printer to successfully complete the labs as some are too lengthy to do from the screen.

#### Overview of Work

This course will consist of both lecture and lab. In the lecture portion of the class, students will be provided with the information necessary to build a functioning Linux server for a variety of business environments with varying requirements (please refer to the Learning Objectives section above).

#### Lectures

Each week will commence with a lecture (or readings) outlining the Linux topic to be solved in the lab.

### Labs

The lab exercises will provide the actual “hands-on” experience in the implementation of the technologies. Students will be encouraged to seek the assistance of their peers in the resolution of implementation requirements and issues. Feel free to post your question to the discussion area where others can help out and learn through collaboration. In addition, students are encouraged to use a variety of outside resources to assist them with the tasks. Though the lab documents contain information needed to successfully complete each lab assignment, it is the responsibility of the student to take it a step further by obtaining additional supportive information through the use of research and available resources.

### Homework Assignments

In addition to textbook readings, students will be given homework assignments geared toward the successful completion of a given task. Of primary importance is the planning necessary for the implementation of a technology, and the documentation of available resources. The homework assignments are research oriented, and will be submitted in written form. The inability of a student to complete an assignment could jeopardize the successful implementation of a lab exercise. Students may be asked to present their homework assignments, and hopefully generate interesting discussions around a myriad of approaches that solve a similar problem.

### Project

A project is assigned where students get to work independently to simulate an “as real as possible” business environment where they have to successfully implement (in more detail) one or more of the technologies NOT covered throughout the semester. In addition to written documentation of the project, students will post their project reports to the class and discuss the results.

### Exams/Quizzes

Students are also given two quizzes and two exams aimed specifically at testing their understanding of the technology rather than their ability to memorize facts for a particular exam. Testing includes multiple choice, matching, short answers, and essays. Most of the questions are designed to have the student think about what they have learned, and answer accordingly. Students may use their system, notes, tests, and other reference materials. With any technology, it is crucial for administrators to be able to obtain answers through reference material.

### Course Schedule

Planned Weekly Topics			Assignments		
Week	Date (Monday)	Topics Covered	Reading	Labs	Homework
1	Sept 1	Introductions / Course Overview  <i>Lecture:</i> What is Linux – Origins to Current  <i>Homework 1 Distributed</i>	1 - 2		
2	Sept 8	<i>Lecture:</i> <ul style="list-style-type: none"> <li>• Installing Linux</li> <li>• Disk structure</li> </ul>	4, 11, 35		

		<ul style="list-style-type: none"> <li>• Network Configuration</li> <li>• Startup</li> <li>• KDE &amp; GNOME GUI familiarization</li> <li>• SHELL command familiarization</li> <li>• Logging in/out</li> <li>• System Startup and Shutdown</li> </ul> <p><i>Lab 1: Installing Linux:</i></p> <ul style="list-style-type: none"> <li>• Linux Installation and preliminary configuration</li> <li>• Using the GUI(s)</li> </ul>			
3	Sept 15	<p><i>Lecture:</i></p> <ul style="list-style-type: none"> <li>• Basic and Advanced System Administration concepts</li> <li>• System initialization and configuration files</li> <li>• X-Windows and Windowing Systems</li> <li>• System initialization and shutdown sequence</li> <li>• More on file systems</li> </ul> <p><i>Lab 2: Working with Linux Commands (the bash shell).</i></p>	3, 14 (Through Advanced Wireless Networking), 32	1	1
4	Sept 22	<p><b>Quiz 1</b></p> <p><i>Lecture: Working with Linux Commands</i></p>	10		
5	Sept 29	<p><i>Lecture: Users Groups, and file permissions</i></p> <p><i>Lab 3: Users, Groups &amp; File Permissions</i></p> <p><i>Homework 2 Distributed</i></p> <p><i>Participation Grade 1 Posted</i></p>	20	2	
6	Oct 6	<p><i>Lecture:</i></p> <ul style="list-style-type: none"> <li>• More commands, and scripting</li> <li>• Telnet, SSH</li> <li>• Brief discussion about FTP</li> </ul> <p><i>Lab 4: Remote Access and Management:</i></p> <ul style="list-style-type: none"> <li>• Setting up telnet clients and server</li> <li>• Using SSH</li> <li>• Issuing commands on a remote server</li> </ul>	8, 14 (From Advanced Wireless Networking to end of chapter)	3	2

		<i>Homework 2 Due</i>			
7	Oct 13	<b>Midterm Exam</b>		4	
		<i>Homework 3 Distributed</i>			
8	Oct 20	Lecture: Refresher on FTP from last time	19		3
		<i>Lab 5: FTP lab</i>			
9	Oct 27	Lecture: <ul style="list-style-type: none"> <li>• Samba and NFS</li> <li>• Printing in Linux.</li> </ul> <i>Lab 6: Implement NFS and SAMBA</i>	34	5	
		<i>Project Distributed</i>			
10	Nov 3	Lecture: <ul style="list-style-type: none"> <li>• Software/package management</li> <li>• Use of rpm, tar, vtar, gzip, gunzip, etc.</li> </ul> <i>Lab 7: Software package installation/update.</i>	21	6	
		<i>Participation Grade 2 Posted</i>			
11	Nov 10	<b>Quiz 2</b>	17	7	
		Lecture: Electronic Mail – Servers and Clients			
		<i>Lab 8: Setting up a mail server</i>			
		<i>Project Due</i>			
12	Nov 17	Read and comment on student projects in discussion area.			
		<i>Thanksgiving Recess - Nov 21-25</i>			
13	Nov 24	Lecture: APACHE web server discussion, setup and configuration	13, 31, 36	8	
		<i>Lab 9: Web server setup</i>			
		<i>Homework 4 Distributed</i>			
14	Dec 1	Lecture: Linux System Security & Firewalls	30	9	
		<i>Lab 10: Security</i>			
15	Dec 8	Wrap-up: Complete remaining assignments		10	4
		<i>Homework 4 Due</i>			

		<i>Participation Grade 3 Posted</i>		
16	Dec 15	<b>Final Exam</b>		

### Methods of Evaluation

Your final grade will be based on a weighted average of the following graded items:

Graded Elements	Weights
Participation	15%
Labs (11)	20%
Midterm Exam	15%
Final Exam	15%
Quizzes (2)	10%
Homework (4)	15%
Project	10%
Total	100%

### Course Policies

#### Netiquette

1. It is VERY important for you to check in with the class regularly. It is suggested you check into the course daily. It won't take you long to get used to checking the course, just as most of you check your e-mail. The more you participate, the more you'll learn.
2. If you are having trouble with any aspect of the course, be sure to contact the instructor promptly.
3. POST ON TIME! Discussion folders will remain open for two consecutive weeks and then will be locked. You will be able to read discussion posts in locked folders, but you will not be able to save new posts there. If you run into a problem and won't be able to post, or have a family emergency of some sort, make sure to call or email the instructor. You have a week to post – don't wait until the last minute! Post early, post often!
4. Follow the basic rules of "netiquette". No flaming, no disrespectful posts, no "inappropriate" language will be tolerated. Proper grammar and punctuation is expected. The basic premise is positive and professional at all times in the discussion areas.

#### Participation

Participation is a key factor to success in an online class. Participation in the discussion forums weighs heavily on the final grade (15%). In order to receive credit you will need to check into the discussion folders each week. Though it will vary from week to week, it is expected that you contribute at least one original post and respond to the posts of at least two other students each week. New discussion folders will be opened and past discussion folders will be locked at the start of each week, so points lost from prior weeks cannot be "made-up". Participate and you should be fine.

The rating scale ranges from 1 to 4 with 1 applying to student participation which is less than acceptable. A score of 4 represents the attainment of the highest standard of participation. Scored rubrics (see table below) will be emailed to students and participation grades will be posted to the course gradebook at

scheduled intervals throughout the semester.

Category	1	2	3	4	POINTS
Promptness and Initiative	Does not respond to most postings; rarely participates freely	Responds to most postings several days after initial discussion; limited initiative	Responds to most postings within a 24 hour period; requires occasional prompting to post	Consistently responds to postings in less than 24 hours; demonstrates good self-initiative	
Delivery of Post	Utilizes poor spelling and grammar in most posts; posts appear "hasty"	Errors in spelling and grammar evidenced in several posts	Few grammatical or spelling errors are noted in posts	Consistently uses grammatically correct posts with rare misspellings	
Relevance of Post	Posts topics which do not relate to the discussion content; makes short or irrelevant remarks	Occasionally posts off topic; most posts are short in length and offer no further insight into the topic	Frequently posts topics that are related to discussion content; prompts further discussion of topic	Consistently posts topics related to discussion topic; cites additional references related to topic	
Expression Within the Post	Does not express opinions or ideas clearly; no connection to topic	Unclear connection to topic evidenced in minimal expression of opinions or ideas	Opinions and ideas are stated clearly with occasional lack of connection to topic	Expresses opinions and ideas in a clear and concise manner with obvious connection to topic	
TOTAL					

### Homework and Lab Assignments

Homework and Lab assignments become available on Monday and are due before midnight on the Wednesday following. Late homework and lab assignments will be accepted up to one week after the due date but will receive a 15% penalty.

### Exams/Quizzes

Students are required to take all quizzes and exams during the scheduled time unless arrangements are made with the instructor prior to the test. Exams and quizzes are timed and become available on Friday at midnight and are due by the following Monday at midnight. Make-up tests will be more rigorous than the regular tests, and will be given at the discretion of the instructor.

### Students With Disabilities

If you believe that you have a disability requiring accommodations in this class, please contact Janine Allo in the Counseling Department, Office of Disability Services, as soon as possible. After you receive your accommodation form, please contact the instructor ASAP to insure all accommodations are implemented in a timely fashion. It is the student's

responsibility to seek and secure accommodations prior to the start of a test or project. Accommodations cannot be provided until you supply the instructor with a form from Janine

Contact: Janine Allo  
Counseling Department, Office of Disability Services  
Office: Hauke 007  
Phone: 802-865-5484  
Email: [jallo@champlain.edu](mailto:jallo@champlain.edu)

#### Academic Honesty

"In the preparation and presentation of any assigned work-including examinations, tests, quizzes, term papers, reports, themes and other written or oral exercises-every student shall conform to a strict standard of academic honesty. Any attempt to deceive a faculty member or to help another student to do so will be considered a violation of this standard. In all assignments, students must acknowledge the words and/or ideas of others taken from print or electronic media, whether a direct quotation or a paraphrase; any omission of this is dishonest. Cheating on examinations or tests consists of knowingly giving, receiving or using-or attempting to give, receive or use-unauthorized assistance during an examination or test. A faculty member may record a grade of "zero" for any assignment on which a student has plagiarized or cheated. For repeat offenses within a single course, the faculty member may record a grade of "F" for the course. Violations of this policy in multiple courses may result in dismissal from the College. A student may appeal these decisions according to the Academic Grievance Procedure."