

University of Washington Extension
Certificate Program in UNIX/Linux Administration

INTENSIVE PROGRAM

Using UNIX/Linux Systems Administering UNIX/Linux Machines Coordinating Large UNIX/Linux System Administration

Summer Quarter, 2002

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Office Hours: Before or after class and by appointment

Certificate Overview:

Upon successful completion of the program the student will have a thorough understanding of the use and operation of a UNIX system. This will include both the command line and graphical "X-Windows" system. Students will also be able to do simple installations of the operating system. Additionally, students will have a broad knowledge of the tasks required to successfully administer a single UNIX/Linux machine or group of independent machines. Finally, students will receive a broad knowledge of the tasks required to successfully administer networks of UNIX/Linux machines

Certificate Description:

This program provides participants with an introduction to UNIX/Linux from a user's perspective, then moves on to a broad overview of system administration tasks and an introduction to writing programs in the PERL scripting language. It finishes with system administration skills for managing and administering groups of machines and more advanced topics in the PERL scripting language.

Program Objectives

After mastering this material, you will be able to:

- Perform basic UNIX installations and make informed installation decisions
- Comfortably operate a UNIX system using the X-Windows interface
- Manipulate files and directories using a wide variety of UNIX utilities
- Edit files using industry standard tools
- Troubleshoot system startup problems
- Understand, change and manipulate the security settings on files and directories
- Identify the state of system resources and manipulate the system for higher performance
- Setup and administer network services
- Setup and install printers
- Schedule jobs to happen at arbitrary times
- Simply configure *standard* UNIX services like ftp, sendmail, DNS and the Apache Web server
- Write simple scripts in PERL to support system administration task
- Configure systems to use the Network File System
- Allows groups of machines to function together using the Network Information Services (NIS)
- Design a network of machines with multiple and redundant specializations to maximize productivity and reliability
- Design tools to allow administration of many machines at the same time
- Write complex scripts in PERL to support system administration tasks

Program Topics

Among the topics covered in this program are:

- The UNIX/Linux environment
 - Fundamentals
 - Commands
 - File systems
- Linux installation
- Booting and startup
- Network setup
- Configuration files; users and groups
- Scheduling jobs; managing printers
- X Windows and GNOME
- Shell operations
- Building kernels
- Printer Setup
- Scheduling Jobs
- Setting up DNS, email, ftp & Web servers
- Setting up users and groups
- Performing most basic system administration tasks

- Writing scripts in the PERL programming language
- TCP/IP networking
- Internetworking
- Security; firewalls
- E-mail and sendmail
- Network File System (NFS)
- Web hosting and proxies
- Network Information Services (NIS)
- Samba

Required Text and Materials:

Evi Nemeth, Garth Snyder, Scott Seebass, Trent R. Hein; UNIX System Administration Handbook
Prentice Hall PTR
ISBN: 0130206016

Randal L. Schwartz, Tom Phoenix, Learning Perl
O'Reilly & Associates
ISBN: 0596001320

Copy of Redhat Linux 7.3: 3 CD Set

Handouts & class materials provided by instructor throughout program: a fee of \$40 will be collected at the beginning of the course to cover copying and binding costs.

Optional Materials:

Petersen, Richard (2001). LINUX: The Complete Reference (With CD-ROM).
4th ed. Osborne/McGraw-Hill Professional Publishing.
ISBN: 0-07-212940-9

Student Evaluation

There are three possible grades for this course: Successful Completion (SC); Unsuccessful Completion (USC); and Incomplete. To receive a passing grade of SC, you must:

- Attend 80% of the classes
- Homework
- Team Project
- Although not quantified, class participation is expected by all students. Your eventual mastery of the material will depend on the amount of effort put into classroom discussion.

Attendance

This class meets for 6 three hour sessions, and 9 eight hour sessions for a total of 90 hours of instruction. Students must attend a minimum of 72 hours of the 90, although higher attendance is recommended to maximize retention and understanding of the material. On 3-hour class nights, attendance will be taken once at the beginning of class. On 8-hour class sessions, attendance will be taken at the beginning of the class and again after the dinner break. Since it is impossible for the instructor to mentally keep track of attendance over the course of the program, **STUDENTS SHOULD NOTE, THAT ATTENDANCE IS BASED ON A SIGN IN SHEET. EACH SHEET WILL COUNT AS EITHER 3 OR 4 HOURS OF CLASS TIME. IF YOU DO NOT SIGN IN YOU DID NOT ATTEND!**

Homework

Each class students will receive a homework assignment. These will usually consist of performing some tasks on remote Linux machines setup for the class. Each of the tasks will be checked by the instructor for completeness. All assignments must be attempted and/or completed by the last day of classes for the student to receive a grade of SC.

Team Project

All students will be divided into five teams (one for each machine). Each team will receive a list of tasks to perform on their team machine. The work can be divided up among the team members as the team decides. All work must be completed by the last class. Task lists will be distributed at the 7th class session.

Course Topics and Readings

<u>Session</u>	<u>Date</u>	<u>Topic</u>		<u>Readings</u>
1	6/11	Course Introduction History of UNIX	<u>USH</u>	Chapter 1
2	6/13	Basic Installation Steps	<u>Internet</u>	Redhat Install Guide
3	6/18	X-Windows	<u>Internet</u>	X-Windows Overview X-Windows User Guide
4	6/20	Introduction to UNIX Fundamentals Introduction to UNIX Commands	<u>Internet</u>	Linux Users Guide Chapter 3 Chapter 4 Chapter 6
5	6/25	UNIX Commands	<u>Internet</u>	Linux Users Guide Chapter 7 Chapter 11 Chapter 6
6	6/27	Editors	<u>Internet</u>	Linux Users Guide Chapter 8 Appendix A
7	7/2	Booting & Startup Network Setup Configuration Files Users & Groups	<u>USH</u>	Chapter 2 Chapter 3 Chapter 6
8	7/9	Scheduling Jobs Managing Printers Building Kernels Managing File Systems Name Services	<u>USH</u>	Chapter 9 Chapter 23 Chapter 12 Chapter 16
9	7/11	Mail Servers FTP Servers Apache Web Server RPM Firewalls	<u>USH</u>	Chapter 19 Chapter 22 Chapter 21

10	7/16	Introduction to PERL Scalar Data Lists & Arrays Subroutines Hashes I/O Basics	<u>LP</u>	Chapter 1 Chapter 2 Chapter 3 Chapter 4 Chapter 5 Chapter 6
11	7/18	Regular Expressions More Control Structures File Handles & Tests Directory Operations Manipulating Files & Dirs Process Management Strings & Sorting Simple Databases	<u>LP</u>	Chapter 7, 8 & 9 Chapter 10 Chapter 11 Chapter 12 Chapter 13 Chapter 14 Chapter 15 Chapter 16
12	7/23	Network File System (NFS) The Automounter Network Information Service (NIS)	<u>USH</u>	Chapter 17 Chapter 18
13	7/25	Integration of NFS, Automounter, & NIS	<u>USH</u>	Review Chapters 17 & 18
14	7/30	Sendmail Configuration Apache Web Server Setup	<u>USH</u>	Chapter 19 Chapter 22
15	8/1	SAMBA Setup Course Wrap-up	USH	Chapter 25

Classroom Closure Information During An Emergency

In the event of an emergency, UWEO staff will gather UWEO facility and campus classroom closure information as soon as possible. Once the information is collected, it will be recorded in three locations:

- Main UW info line, 206-547-INFO (an option will be recorded specifically for UWEO student and instructor information.)
- Main UWEO info recording at 206-543-2320 (option #8 on main menu.)
- UWEO web site, www.outreach.washington.edu. (Information will be provided in the form of a red alert. There will also be a link from the main UW page to this alert.)

Disability Services

If you would like to request academic accommodations due to a disability, please contact the Disability Services Office, 4045 Brooklyn Ave. NE, #230, (206) 543-6450 or (206) 685-7208 (V), (206) 543-6452 (TTY). If you have a letter from the Disability Services Office indicating you have a disability that requires academic accommodations, please present the letter to me so we can discuss the accommodations you might need for the class.

Shared Machines

During this program students will be evenly distributed to 5 different machines to perform their homework assignments. The machines will be available from the Internet 24 hours a day through the entire quarter (barring unforeseen downtime). It is expected that students will not abuse these systems in any way. That includes tampering with other students account, running any unauthorized services, sending SPAM, hacking or anything else that would be considered unethical. If in doubt, ask the instructor. Violations of this privilege will result in expulsion from the program according to UWEO policies.