

SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY

SAULT STE. MARIE, ONTARIO



COURSE OUTLINE

COURSE TITLE: Advanced Linux

CODE NO. : CSO203 **SEMESTER:** 4

PROGRAM: IT Studies

AUTHOR: Fred Carella

DATE: Winter 2010 **PREVIOUS OUTLINE DATED:** Winter 2009

APPROVED: "B. Punch"

CHAIR

DATE

TOTAL CREDITS:

PREREQUISITE(S):

HOURS/WEEK:

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I. COURSE DESCRIPTION:

This course prepares the technician for installing and managing the Linux operating system.

It develops skills in typical systems management tasks including installation, upgrading, system configuration, security, backups, performance tuning, system monitoring and account management.

The operating system to be used is Fedora/Redhat Enterprise however the skills learned are generic enough to be transferable to other distributions.

This is the second of two courses in Linux which will develop the students ability to use and manage various operating systems (CSO 102 was the first course).

II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:

Upon successful completion of this course, the student will demonstrate the ability to:

1. Install and configure a Linux distribution Potential Elements of the Performance:

- understand and discuss the following
 - what is Linux
 - the components make up a Linux distribution
 - Fedora Core Linux
- perform the following procedures
 - Install Fedora Core
 - pre installation research
 - create an installation checklist
 - choose an installation class
 - choose an installation method (nfs, ftp, http, smb, cdrom)
- install
 - prepare and partition hard drives
 - choose a boot loader
 - create boot floppies
 - install it.
 - startup and shutdown properly
 - post installation procedures

- keyboard configuration
- sound configuration

2. Perform System Administration

Potential Elements of the Performance:

- Update and Upgrade Fedora Core Linux
 - update the system using different methods.
 - update using Fedora Core Update
 - update with “yum” and “apt”
 - upgrade the System
- Manage Services
 - start and stop services
 - configure boot time services
 - understand and manipulate run-levels
- Manage Software Resources
 - understand software distribution, the Open Source Model and the Fedora Core Package Manager (RPM)
 - use command line RPM
 - use GUI RPM tools
 - install, remove, upgrade software packages.
 - understand binary versus source application software distribution and how to build and install software distributed as a “tarball” and as an “SRPM”.
 - understand and apply software updates using YUM and APT
- Manage Users.
 - define users
 - define user accounts and their attributes
 - understand passwords and security issues.
 - Add/modify/delete accounts using command line and GUI tools.
- Manage File Systems.
 - understand devices in general and disks in particular.
 - manipulate partitions using various command line tools
 - create devices using mknod
 - understand filesystems.
 - compare and contrast various filesystems available in linux.
 - create file systems.
 - Interact with other vendor file systems (Windows FAT, VFAT, NTFS)
 - understand and manipulate /etc/fstab, the file system table.
 - Mount and unmount filesystems.
- Backup and Restore and Recovery
 - understand backup strategies.
 - become aware of various hardware and backup media
 - use various backup and restore software including some but not all of

- tarball
 - cpio
 - dump and restore
 - ark
 - dd
 - Amanda
 - commercial software
- Recovery
 - backup and restore the MBR
 - boot from rescue CD
 - boot from generic boot floppies
 - installation disk recovery procedures
3. System Services
- Potential Elements of the Performance:
- understand the lpd system and /etc/printcap
 - configure client printing services using GUI tools.
 - Configure Network Connectivity
 - Use gui tools to configure
 - Subnets
 - Addressing
 - network devices
 - dhcp
 - Configure various network file systems including
 - nfs
 - samba (smb)
 - Understand and Configure DNS services
 - Configure Apache Web Server Software
 - Configure database servers in particular MySQL
 - Configure FTP services
4. Programming and Productivity Tools
- Potential Elements of the Performance:
- become aware of and use to a limited degree
 - the C/C++ compiler suite (gcc)
 - build tools (make, autoconf)
 - debugging tools
 - shell scripting
 - perl
 - understand the kernel and the need for rebuilding a kernel
 - configure a kernel
 - build a kernel
 - build modules
 - install above kernels
 - Productivity Applications.

- Become familiar with various productivity tools, in particular those which come with Gnome (stock and Ximian GNOME) and Open Office.

III. TOPICS:

1. Linux installation and configuration
2. System administration
3. System services
4. Programming and Productivity

IV. REQUIRED RESOURCES/TEXTS/MATERIALS:

A Practical Guide to RedHat Linux, Fedora Core and Redhat Enterprise Linux
 Author: Mark G. Sobell.
 Publisher: Prentice Hall

V. EVALUATION PROCESS/GRADING SYSTEM:

Tests:

Installation	10%
System Administration	25%
System Services	25%

Labs:

Linux	30%
Linux Practical Test(s)	<u>10%</u>
<i>Total</i>	<i>100%</i>

Note a passing grade in both the test and lab portion is required to pass the course.

The following semester grades will be assigned to students:

<u>Grade</u>	<u>Definition</u>	<u>Grade Point Equivalent</u>
A+	90 – 100%	
A	80 – 89%	4.00
B	70 - 79%	3.00
C	60 - 69%	2.00
D	50 – 59%	1.00
F (Fail)	49% and below	0.00

CR (Credit) Credit for diploma requirements has been

	awarded.
S	Satisfactory achievement in field /clinical placement or non-graded subject area.
U	Unsatisfactory achievement in field/clinical placement or non-graded subject area.
X	A temporary grade limited to situations with extenuating circumstances giving a student additional time to complete the requirements for a course.
NR	Grade not reported to Registrar's office.
W	Student has withdrawn from the course without academic penalty.

VI. SPECIAL NOTES:

Course Outline Amendments:

The professor reserves the right to change the information contained in this course outline depending on the needs of the learner and the availability of resources.

Retention of Course Outlines:

It is the responsibility of the student to retain all course outlines for possible future use in acquiring advanced standing at other postsecondary institutions.

Prior Learning Assessment:

Students who wish to apply for advance credit transfer (advanced standing) should obtain an Application for Advance Credit from the program coordinator (or the course coordinator regarding a general education transfer request) or academic assistant. Students will be required to provide an unofficial transcript and course outline related to the course in question. Please refer to the Student Academic Calendar of Events for the deadline date by which application must be made for advance standing.

Credit for prior learning will also be given upon successful completion of a challenge exam or portfolio.

Substitute course information is available in the Registrar's office.

Disability Services:

If you are a student with a disability (e.g. physical limitations, visual impairments, hearing impairments, or learning disabilities), you are encouraged to discuss required accommodations with your professor and/or the Disability Services office. Visit Room E1101 or call Extension 2703 so that support services can be arranged for you.

Communication:

The College considers **WebCT/LMS** as the primary channel of communication for each course. Regularly checking this software platform is critical as it will keep you directly connected with faculty and current course information. Success in this course may be directly related to your willingness to take advantage of the **Learning Management System** communication tool.

Plagiarism:

Students should refer to the definition of “academic dishonesty” in *Student Code of Conduct*. A professor/instructor may assign a sanction as defined below, or make recommendations to the Academic Chair for disposition of the matter. The professor/instructor may (i) issue a verbal reprimand, (ii) make an assignment of a lower grade with explanation, (iii) require additional academic assignments and issue a lower grade upon completion to the maximum grade “C”, (iv) make an automatic assignment of a failing grade, (v) recommend to the Chair dismissal from the course with the assignment of a failing grade. In order to protect students from inadvertent plagiarism, to protect the copyright of the material referenced, and to credit the author of the material, it is the policy of the department to employ a documentation format for referencing source material.

Student Portal:

The Sault College portal allows you to view all your student information in one place. **mysaultcollege** gives you personalized access to online resources seven days a week from your home or school computer. Single log-in access allows you to see your personal and financial information, timetable, grades, records of achievement, unofficial transcript, and outstanding obligations. Announcements, news, the academic calendar of events, class cancellations, your learning management system (LMS), and much more are also accessible through the student portal. Go to <https://my.saultcollege.ca>.

Electronic Devices in the Classroom:

Students who wish to use electronic devices in the classroom will seek permission of the faculty member before proceeding to record instruction. With the exception of issues related to accommodations of disability, the decision to approve or refuse the request is the responsibility of the faculty member. Recorded classroom instruction will be used only for personal use and will not be used for any other purpose. Recorded classroom instruction will be destroyed at the end of the course. To ensure this, the student is required to return all copies of recorded material to the faculty member by the last day of class in the semester. Where the use of an electronic device has been approved, the student agrees that materials recorded are for his/her use only, are not for distribution, and are the sole property of the College.

Attendance:

Sault College is committed to student success. There is a direct correlation between academic performance and class attendance; therefore, for the benefit of all its constituents, all students are encouraged to attend all of their scheduled learning and evaluation sessions. This implies arriving on time and remaining for the duration of the scheduled session.

Absenteeism will affect a student's ability to succeed in this course. Absences due to medical or other unavoidable circumstances should be discussed with the instructor. Students are required to be in class on time and attendance will be taken within the first five minutes of class. A missed class will result in a penalty in your marks unless you have discussed your absence with the professor as described above. The penalty depends on course hours and will be applied as follows:

Course Hours	Deduction
5 hrs/week (75 hrs)	1% / hr
4 hrs/week (60 hrs)	1.5% /hr
3 hrs/week (45 hrs)	2% /hr
2 hrs/week (30 hrs)	3%/hr

Absentee reports will be discussed with each student during regular meetings with Faculty Advisors. Final penalties will be reviewed by the professor and will be at the discretion of the professor.

Tuition Default:

Students who have defaulted on the payment of tuition (tuition has not been paid in full, payments were not deferred or payment plan not honoured) as of the first week of March will be removed from placement and clinical activities. This may result in loss of mandatory hours or incomplete course work. Sault College will not be responsible for incomplete hours or outcomes that are not achieved or any other academic requirement not met as of the result of tuition default.

Students are encouraged to communicate with Financial Services with regard to the status of their tuition prior to this deadline to ensure that their financial status does not interfere with academic progress.