



## I. COURSE DESCRIPTION:

This course introduces the student to the Linux Operating system with particular emphasis on command line tools, utilities and shell scripting. The student will learn and apply the various commands and utilities related to file system management, process management, program development and data processing. In addition the student will learn about shell concepts and become proficient in the use of shell features such as command line editing and learn and apply Unix concepts such as pipes and filters. The student will apply the aforementioned utilities and concepts in the writing of shell scripts.

## II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:

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

### 1. **Discuss the history and development of the Linux Operating System.**

#### Potential Elements of the Performance:

- Describe the relationship between GNU and Linux.
- Describe the relationship between Linux and Unix.
- Discuss features which make Linux a viable and popular operating system.

Describe various operating system concepts such as multitasking, virtual memory and multiuser environments as they apply to Linux.

### 2. **Work within a command line environment.**

#### Potential Elements of the Performance:

- Log in, from a terminal, a virtual terminal and remotely.
- Log out.
- Work with the shell and learn shell features such as command line editing.

Access the various help systems.

**3. Describe and apply various command line utilities.**Potential Elements of the Performance:

- Describe and apply various file related commands
  - List the names of files
  - Display the contents of a file.
  - Delete a file.
  - Copy a file.
  - Move a file.
  - Print a file.
  - Search the contents of a file.
  - Pack and Unpack files (archiving).
  - Find files.
- Describe and apply various utilities
  - Display text.
  - Display time and date.
  - Test for a files contents.
  - Obtain user information.
  - Communicate with other users.

**4. Work with the file System.**Potential Elements of the Performance:

- Describe hierarchical file systems.
- Create and delete directories.
- Understand and apply knowledge of absolute and relative pathnames when specifying files.
- Describe the standard file and directory layout.
- Describe the various file types.
- Create and delete hard and soft (symbolic) links.
- Create and modify file permissions.

**5. Work with shells.**Potential Elements of the Performance:

- Understand how the command line is parsed and processed.
- Understand the concept of standard input and output.
- Understand and apply I/O redirection.
- Understand and apply the concepts of pipes and filters.
- Manipulate the directory stack.
- Understand the concept of shell parameters and variables.
- Create, view and delete shell variables.
- Understand how processes are created and their attributes.
- Create foreground and background processes.
- Create, view and delete processes.
- Work with shell history.
- Understanding the readline library and its features as applied to command line editing.
- Understand how shells are started and view/modify the shell configuration files.
- Create, modify and delete aliases.
- Create and execute simple shell scripts.
- Create and use functions.

**6. Write shell scripts.**Potential Elements of the Performance:

- Understand and apply the following concepts and features to the writing of shell scripts:
  - Flow Control structures:
    - if...then...else
  - Looping Control structures:
    - for ... in
    - for...
    - while...
    - until...
  - Menu Control Structures:
    - select...
  - The “here” document
  - Arrays.
  - Special parameters.
  - Positional parameters and shifting.
  - Expressions.
  - Operators.
  - Pattern matching.

**7. Data Processing Utilities.**Potential Elements of the Performance:

- Process files using gawk
- Process files using sed

**8. Programming in C**Potential Elements of the Performance:

- Write a simple C program
- Compile and run a C program
- Understand the “make” utility and create a makefile to build a program.
- Create and use shared libraries.

**III. TOPICS:**

1. Introduction to the Linux Operating System.
2. The Linux Command Line.
3. Command Line Utilities.
4. The File System.
5. Working with Shells.
6. Writing Shell Scripts.  
Data Processing Utilities.  
Programming in C

**IV. REQUIRED RESOURCES/TEXTS/MATERIALS:****A Practical Guide to Linux, Commands Editors and Shell Programming.**

Mark G Sobell,  
Prentice Hall,  
ISBN: 0-13-147823-0

**Bash Guide for Beginners**

<http://www.tldp.org/LDP/Bash-Beginners-Guide/html/index.html>

**Advanced BASH Scripting Guide:**

<http://www.tldp.org/LDP/abs/html/>

**V. EVALUATION PROCESS/GRADING SYSTEM:****Tests:**

Topics 1-3 – 20%

Topics 4-6 – 30%

Topics 7-8 – 10%

**Labs:**40%  
100%

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%	4.00
A	80 – 89%	3.00
B	70 - 79%	2.00
C	60 - 69%	1.00
D	50 – 59%	0.00
F (Fail)	49% and below	
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:

<b>Course Hours</b>	<b>Deduction</b>
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.