

Unix/Linux Shell Scripting

School of Advanced Technology

Course Number: CST8129	Contribution to Program: Vocational Core	Educator(s): Ian Allen
Applicable Program(s): Computer Engineering Technology - Computing Science – 006X Computer Engineering Technology – 178X	AAL: 02	Approval Date: Fall 2002
Course Hours: Delivered: 64 Normative: 64	Prerequisites: CST8110 (Intro to Computing) CST8201 (Desktop Operating Systems)	Approved By: Claude Brulé, Chair Computer Studies Department
	Corequisites: None	Approved for Academic Year: 2002-2003

COURSE DESCRIPTION

Unix/Linux Shell Scripting builds upon the foundation laid for systematic problem solving (CST8110) and the basics of the Unix/Linux operating systems (CST8201), both in Level 01, to cover in some detail the essential elements of shell scripting in both **bash** and **tcsh**. This course will also prepare the student for the successor courses by addressing **regular expressions**, and in making use of powerful command-line tools and utilities including **sed**, **grep**, and **awk**. Some issues involved in system administration will also be addressed.

RELATIONSHIP TO PROGRAM LEARNING OUTCOMES

This is a vocational course that supports the following vocational program standards:	This course contributes to your program by helping you to achieve the following provincial generic skills standards:
(Under review)	(Under review)

COURSE CURRICULUM

1. Course Learning Requirements/Embedded Knowledge and Skills

Course Learning Requirements	Knowledge and Skills
When you have earned credit for this course you will have demonstrated an ability to:	
Know the significant arguments for and use many of the common Linux commands	Fifty and more common Linux commands
Learn Linux file editing with one of the common variants of vi , the visual editor	Make use of on-screen editing control sequences, ed edit mode commands, etc.
Understand and be able to make effective and efficient use the LINUX file system	LINUX file structure, commonly used commands, file permissions
Understand the concept of process creation, program execution in the foreground and in the background, I/O redirection, and pipes	Process structure, process creation, concepts of command line redirection in bash and tcsh
Learn how to construct and analyze both standard and extended regular expressions	Regular expressions , as used in grep , sed , and other commands
Make use of awk and other Linux tools for data manipulation	Data manipulation tools: awk , sed , cut , tr , sort , etc.
Work effectively in the LINUX environment using available shell programming tools	Shell programming in both bash and tcsh
Understand some of the issues involved in system administration and security	login scripts, shell customization, environment settings, password files, etc.

2. Learning Resources

a. Required Text:

- Ellie Quigley, “Linux Shells by Example”, Prentice-Hall, 2000.
ISBN 0-13-014711-7
- Online Web Resources - CST8129 Home Page for Fall 2002:
URL: <http://www.algonquincollege.com/~alleni/cst8129/02f/>

b. Suggested References:

- Streib, Turner, et al, "Practical Linux"; Que Corporation, June 2000. ISBN 0-7897-2251-8 (from CST8201)
- The Linux operating system, free and widely available for Intel Pentium PC's.
- Any Linux or Unix book from O'Reilly & Associates, including:
 - Linux in a Nutshell
 - Learning the bash Shell;
 - Learning the vi Editor
 - sed and awk
 - Mastering Regular Expressions

c. Teaching/Learning Methods

Course material will be presented using classroom lectures, hands-on laboratory work, assignments, homework, and online resources such as Web pages. Students may develop solutions to assignments and homework using any Unix/Linux system they choose, including systems at home or at work; however, for full credit, the final solutions must work correctly on the Unix/Linux workstations provided for this course at the College.

Teaching / Learning Methods

This course consists of 2 hours lectures and a 2-hour lab per week. It is anticipated that you will spend an additional 5 hours/week on assignments and study.

During this course, you are likely to experience:

Lectures:

The theoretical material of the course will be presented during lectures, laboratory sessions, homework, and online through the Web. Students are responsible for **all** the theoretical material presented. If you miss a class, lab, or assignment, make sure you get the relevant notes from another student before the next class.

Students are strongly encouraged to ask questions during lectures and lab sessions. The course material is cumulative and does not lend itself well to "cramming" at the last minute. Ask your questions early and often.

Labs:

Laboratory assignments will be closely integrated with the lecture material and with material used to prepare tests and exams. The students' ability to successfully complete the assigned exercises will directly correlate with their level of success on tests and the final exam.

Unix/Linux laboratory time is scarce. Students are expected to perform initial analysis and design work before their scheduled lab time. There is not enough time to do all of read, analyse, code, and demonstrate a lab assignment during the assigned lab hours. Be prepared.

Some laboratory work has time as an evaluation parameter and will require you to complete the work by a specified time for full marks. Late assignments will be penalized (and the penalty may be up to 100% per assignment). For full marks, pay attention to the submission deadlines set for each laboratory assignment.

Assignment deadlines may differ between sections of this course. Your assignments are due in the lab shown on your timetable.

Tests:

Online tests, exams, and in-laboratory exercises will be conducted in a Unix/Linux-only test environment similar to that found on the Unix/Linux workstations provided for this course. For this reason, students must develop facility with Unix/Linux command-line text editors and shell commands; no access to a GUI or other machines or operating systems (e.g. OSX, Windows) will be allowed.

Tests and exams are prepared from material given in assignments and homework. Failure to do the assignments or homework may mean you don't have enough time to complete similar questions found on tests and exams. Do your homework.

Consultation (News Groups / Office Appointments):

Your instructor is available outside of classroom time for group or personal consultation on topics related to the course material. Consult the course home page for details on how to ask questions outside of class time and/or arrange an office appointment:

URL: <http://www.algonquincollege.com/~alleni/cst8129/02f/>

Questions about course content should not be sent directly, but instead be posted to the news group (discussion board) dedicated to the course. The address of this news group is available on the course home page. Answers will be posted frequently. This will allow everyone in the course to share information about the course content in a more meaningful way.

3. Evaluation/Earning Credit

Final marks are calculated as following:

ITEM	DESCRIPTION	WEIGHT
1.	Term test 1	10 %
2.	Term test 2	15 %
3.	Final Exam	25 %
4.	In-lab Exercises	25 %
5.	Assignments	25 %

To receive a course credit, the student must achieve a minimum of 50% in **each** of the following evaluation areas:

- Weighted sum of the Term Tests
- Final Exam
- Weighted sum of In-lab Exercises
- Weighted sum of Assignments

Evaluation Notes:

1. Attendance at the laboratory sessions is strongly recommended but is not mandatory, although attendance will be recorded. Students who are unable to attend a lab session must obtain their instructor's prior consent in order to keep their attendance records current. **Lab attendance will play a role in evaluating student performance.**
2. The Computer Studies Department has adopted a standard for the submission of homework and laboratory assignments. Student submissions that do not meet the published submission standards for this course will be penalized, and the penalty may be up to 100% per assignment. The submission standards for this course are available as a link on the home page for this course: URL: <http://www.algonquincollege.com/~alleni/cst8129/02f/>
3. Late assignment submissions and late in-lab exercise demonstrations will be penalized, and the penalty may be up to 100% per evaluation. Extenuating personal circumstances and extensions may be considered if good documentation is supplied (e.g. a medical note).
4. See the course web page for the exact dates of tests and the weights of assignments and homework. Later assignments are weighted more heavily than earlier ones.

All students are required to write the final exam. There are no provisions for "making up" a missed final exam. If, as a result of being off-track in your program or some unforeseen circumstance, you note that there is a scheduling conflict in your final exam schedule, it is your responsibility to alert the Registrar's Office no later than one week before final exams start, to allow for any special arrangements.

VI. Related Information

Retention of course material. It is your responsibility to retain copies of all assignments, labs and mid-term tests (returned from the professor), and any other evaluations and pertinent records (except for final exams, which are not returned) in case you become involved in an appeal hearing at a later date.

It is also your responsibility to retain course outlines for possible future use to support applications for transfer of credit to other educational institutions.

See College Directives E15 or E24 for details in your Instaguide.

College email account. Algonquin College provides all full-time students with an email account. This is the address that will be used when the College, your professors, or your fellow students communicate important information about your program or course events. It is your responsibility to ensure that you know how to send and receive email using your Algonquin College account, and check it regularly.

Harassment/Discrimination/Violence will not be tolerated. Any form of harassment (sexual, racial, gender or disability-related), discrimination (direct or indirect), or violence, whether towards a professor or amongst students, will not be tolerated on the college premises. Action taken will start with a formal warning and proceed to the full disciplinary actions as outlined in Algonquin College Directive - A8.

Harassment means one or a series of vexatious comment(s) (whether done verbally or through electronic means), or conduct related to one or more of the prohibited grounds that is known or ought reasonably to be known to be unwelcome/unwanted, offensive, intimidating, derogatory or hostile.

This may include, but is not limited to: gestures, remarks, jokes, taunting, innuendo, display of offensive materials, offensive graffiti, threats, verbal or physical assault, stalking, slurs, shunning or exclusion related to the prohibited grounds.

For further information, a copy of the official policy statement can be obtained from the Student Association.

The School of Advanced Technology's Standard Operating Procedure on Plagiarism and Academic Honesty defines plagiarism as an attempt to use or pass off as one's own idea or product, work of another without giving credit. Plagiarism has occurred in instances where a student either directly copies another person's work without acknowledgement; or, closely paraphrases the equivalent of a short paragraph or more without acknowledgement; or, borrows, without acknowledgement, any ideas in a clear and recognizable form in such a way as to present them as one's own thought, where such ideas, if they were the student's own would contribute to the merit of his or her own work.

Plagiarism is one of the most serious academic offences a student can commit. Anyone found guilty will, on the first offence, be given a written warning and an "F" on the plagiarized work. If the student commits a second offence, an "F" will be given for the course along with a written warning. A third offence will result in suspension from the program and/or the college.

For further details on this directive, consult the Algonquin College Directive - E16 in your Instaguide, and the School of Advanced Technology's Standard Operating Procedure on Plagiarism and Academic Dishonesty.

Violation of the Copyright Act.

- General – The Copyright Act makes it an offence to reproduce or distribute, in whatever format, any part of a publication without the prior written permission of the publisher. For complete details, see the Government of Canada website at <http://www.cb-cda.gc.ca/info/act-e.html> . Make sure you give it due consideration, before deciding not to purchase a textbook or material required for your course.
- **Software Piracy.** The Copyright Act has been updated to include software products. Be sure to carefully read the licensing agreement of any product you purchase or download, and understand the term and conditions covering its use, installation and distribution (where applicable). Any infringement of licensing agreement makes you liable under the law.

The Use of Electronic Devices, with the sound turned on, during classes is strictly prohibited. In particular, cell phones are not to be used to communicate during a class. The use of any electronic devices during exams and mid-term tests, other than those sanctioned by the faculty in charge of the examination, is strictly prohibited.

Anyone caught using a prohibited device will be considered to have plagiarized, and will be treated as such in accordance with College Plagiarism Policy. For further details on this directive, consult the Algonquin College Directive E39 on the use of Electronic Devices in Class and Exams.

Disruptive Behaviour is any conduct, or threatened conduct, that is disruptive to the learning process or that interferes with the well-being of other members of the College community. It will not be tolerated.

Members of the College community, both students and staff, have the right to learn and work in a secure and productive environment. The College will make very effort to protect that right.

Incidents of disruptive behaviour must be reported in writing to the departmental Chair as quickly as possible. The Chair will hold a hearing to review available information and determine any sanctions that will be imposed. Disciplinary hearings can result in penalties ranging from a written warning to expulsion.

For further details, consult the Algonquin College Directive - E27 in your Instaguide.

Students with Disabilities. If you are a student with a disability that affects your learning ability, and wish to receive special dispensation or academic accommodation, you are first required to identify your needs to the Centre for Students with Disabilities (CSD) so that support services can be arranged for you.

If, as a result of that consultation process, you are issued a letter from the CSD office prescribing certain special academic accommodations for that academic term, it is your responsibility to present this letter to each of your course professors, in order to obtain the special dispensation you are entitled to.

For further details, consult the Algonquin College Directive – E4 in your Instaguide.

Prior Learning Assessment (PLA)

See College Directive E35 for details on eligibility and process.

For this course, evidence of learning achievement for PLA candidates will include the successful completion of:

- A challenge exam with a breadth of coverage and level of difficulty equivalent to the final examination in the course;
- A hands-on or practical component to ensure that the requisite skill level has been achieved; and
- A computer programming (where applicable) assignment comparable to a representative assignment in the course.