

Linux Operating Systems I

SCHOOL OF ADVANCED TECHNOLOGY

Course Number: CST8207	Contribution to Program: Vocational Core	Normative Hours: 75
Applicable Program(s): 0150X01FWO Computer Systems Technician 1 0150X03FWO Computer Systems Technician 1 0155X01FWO Computer Systems Technology - Networking 1 0156X01FWO Computer Systems Technology - Security 1	AAL: 1 1 1 1	Approval Date: 13/06/2011
Prepared by: Todd Kelley Professor		Approved by: Andrew Pridham Academic Chair, ICT
Co-Requisites N/A		Approved for Academic Year: 2011-2012
Pre-Requisites N/A		

COURSE DESCRIPTION

This course introduces students to the basic concepts and core functions of the Linux operating system in a stand-alone environment. Students learn basic command structures and capabilities of the Linux operating system, along with the skills required to perform common basic system configuration and management tasks. Typical tasks covered include, but are not limited to installing the operating system, working the command line shell, managing/mounting/creating file systems, file permissions overview, managing and troubleshooting the boot process, task automation, software management and customizing the operating system environment.

RELATIONSHIP TO VOCATIONAL LEARNING OUTCOMES

This course contributes to your program by helping you achieve the following Vocational Learning Outcomes:

Computer Systems Technician 0150X01FWO

- 1 Analyze and resolve information technology problems through the application of systematic approaches and diagnostic tools.(T,A)
- 2 Support the implementation and administration of computer systems. (T,A)
- 4 Install, configure, troubleshoot, maintain, and upgrade components of computer systems. (T,A)
- 6 Use a variety of scripting tools and languages to automate routine tasks. (T)
- 7 Follow, monitor, and document data storage procedures designed to ensure the integrity of information. (T,A)
- 10 Conform to workplace expectations found in information technology (IT) environments. (T)

Computer Systems Technician 0150X03FWO

Computer Systems Technology - Networking 0155X01FWO

Computer Systems Technology - Security 0156X01FWO

T: Teach A: Assess CP: Culminating Performance

ESSENTIAL EMPLOYABILITY SKILLS

The course contributes to your program by helping you achieve the following Essential Employability Skills:

- 2 Respond to written, spoken or visual messages in a manner that ensures effective communication.(T,A)
- 4 Apply a systematic approach to solve problems.(T,A)
- 5 Use a variety of thinking skills to anticipate and solve problems.(T,A)
- 6 Locate, select, organize and document information using appropriate technology and information systems.(T,A)
- 7 Analyze, evaluate and apply relevant information from a variety of sources.(T,A)

11 Take responsibility for one's own actions, decisions and consequences.(A)

T: Teach A: Assess CP: Culminating Performance

COURSE LEARNING REQUIREMENTS/EMBEDDED KNOWLEDGE AND SKILLS

COURSE LEARNING REQUIREMENTS When you have earned credit for this course, you will have demonstrated the ability to:	EMBEDDED KNOWLEDGE AND SKILLS
1. Use standard Linux commands	<ul style="list-style-type: none"> • Accurately interpret the basic command set of the Command Line Interface within the Linux environment • Utilize and deduce the basic behaviours of commands associated with the Graphical User Interface within the Linux environment • Properly use and identify the behaviour of redirection and pipes within the shell environment. • Relate the architecture of shell environments. Identify the steps involved in parsing the command line within the shell environment. Identify the behaviour of redirection and pipes within the shell environment.
2. Installing Linux	<ul style="list-style-type: none"> • Review the basic computer hardware layout; with emphasis on the hard drive, partition types and the Master Boot Record • Identify the steps involved in creating and be able to modify Linux partitions • Recognize and execute the basic installation steps of a Linux-based operating system.
3. Create and manage a file system under Linux.	<ul style="list-style-type: none"> • Relate the history and responsibilities of a file system within the Linux environment. Identify and modify file systems within the Linux environment. • Identify the basic data structures that make up a Linux-based file system • Utilize and accurately recognize the behaviour of the tools and utilities available to create and manage partitions and file systems within Linux • Create and manage journaling file systems with ext2 and ext3
4. Create and manage user accounts and access control in a Linux-based environment	<ul style="list-style-type: none"> • Plan for a multi-user operating system • Recognize the use of and modify file and directory access control under Linux • Understand and implement proper user account management of the Linux environment
5. Install and configure software in a Linux-based environment.	<ul style="list-style-type: none"> • Implement software installation procedures of a Linux-based O/S, both package based (RPM), compiled and automated (YUM)
6. Manage the boot process under Linux.	<ul style="list-style-type: none"> • Recognize and accurately modify the Linux boot & startup process • Properly identify the system startup and shutdown procedures • Manage services after start-up: service management scripts and run-levels • Configure the boot loader (GRUB/LILO)

LEARNING RESOURCES

Required Textbook:

Package (ISBN: 0-132-37382-3) containing:

- [A Practical Guide to Fedora and Red Hat Enterprise Linux](#), 5th ed., by Mark Sobell, Prentice Hall ISBN 0-13-706088-2
- [Linux Phrasebook](#), by Scott Granneman, Prentice Hall ISBN 0-672-32838-0

N.B.: Package deal is ONLY available in Algonquin Bookstore.

Recommended Textbook:

- Linux Administration Handbook , 2nd ed., by Evi Nemeth et al, Prentice Hall, ISBN 0-13-148004-9 Linux Administration, A Beginner's Guide, 5th ed., by Wale Soyinka, McGraw Hill, ISBN 9780071545884
- Linux in a Nutshell, 5th ed., Jessica Perry Hekman, O'Reilly, ISBN 0-596-00930-5

Required Equipment for lab:

- A hard disk and ESATA drive enclosure *
- A blank CD-R or CD-RW
- A binder for labs & lab notes during the semester

* Included in incidental fees and associated package form the Algonquin College New Technology Store

LEARNING ACTIVITIES

During this course, you are likely to experience the following learning activities:

Lectures:

Lectures will present the theoretical material of the course. Students are expected to attend all of the lectures. Students are encouraged to ask questions during lectures and to consult with the professors on topics, which they do not clearly understand. Professors will inform students, at the beginning of the course, of suitable times for consultations.

An overview of concepts related to the administration of a stand-alone system, explanation of the use of related commands, and examples of implementation.

Labs:

Labs that include a guided section in which the student learns how to apply the tools used in the administration of a stand-alone system, and a challenge section in which the student learns how to implement the tools used in the administration of a stand-alone.

While the textbook and lectures constitute the prime source of information, students are expected to be proactive in following up reading and Internet references that are provided. The material in this course is constantly subject to change, so an ability to ferret out and exchange new information is a valuable asset.

Students are expected to perform initial analysis and design before their scheduled lab, in order to take advantage of the limited lab time. Laboratory assignments will be closely integrated with the lecture material.

The students' ability to successfully complete the assigned exercises will directly correlate with their level of success on tests and the final exam.

Samples of learning activities may include:

- Practical and reading assignments (book and online learning materials)
- Assigned laboratory work
- Research of course related-materials through supplied links - Homework assignments
- Group discussion

Lab assignments - typical assignments will include: hands-on assignments on the major topics covered in lectures.

EVALUATION/EARNING CREDIT

The following will provide evidence of your learning achievements:	This activity validates the following Course Learning Requirements and/or Essential Employability Skills:
Term Tests (x2) - 35%	<ul style="list-style-type: none"> • Use standard Linux commands - [CLR 1] • Installing Linux - [CLR 2] • Create and manage a file system under Linux. - [CLR 3] • Create and manage user accounts and access control in a Linux-based environment - [CLR 4] • Install and configure software in a Linux-based environment. - [CLR 5] • Manage the boot process under Linux. - [CLR 6] • Apply a systematic approach to solve problems. - [EES 4] • Use a variety of thinking skills to anticipate and solve problems. - [EES 5] • Respond to written, spoken or visual messages in a manner that ensures effective communication. - [EES 2]

	<ul style="list-style-type: none"> • Take responsibility for one's own actions, decisions and consequences. - [EES 11]
<p>Final Exam - 30%</p>	<ul style="list-style-type: none"> • Use standard Linux commands - [CLR 1] • Installing Linux - [CLR 2] • Create and manage a file system under Linux. - [CLR 3] • Create and manage user accounts and access control in a Linux-based environment - [CLR 4] • Install and configure software in a Linux-based environment. - [CLR 5] • Manage the boot process under Linux. - [CLR 6] • Apply a systematic approach to solve problems. - [EES 4] • Use a variety of thinking skills to anticipate and solve problems. - [EES 5] • Respond to written, spoken or visual messages in a manner that ensures effective communication. - [EES 2]
<p>Lab Evaluation - 25%</p>	<ul style="list-style-type: none"> • Use standard Linux commands - [CLR 1] • Installing Linux - [CLR 2] • Create and manage a file system under Linux. - [CLR 3] • Create and manage user accounts and access control in a Linux-based environment - [CLR 4] • Install and configure software in a Linux-based environment. - [CLR 5] • Manage the boot process under Linux. - [CLR 6] • Respond to written, spoken or visual messages in a manner that ensures effective communication. - [EES 2] • Apply a systematic approach to solve problems. - [EES 4] • Use a variety of thinking skills to anticipate and solve problems. - [EES 5] • Locate, select, organize and document information using appropriate technology and information systems. - [EES 6] • Analyze, evaluate and apply relevant information from a variety of sources. - [EES 7] • Take responsibility for one's own actions, decisions and consequences. - [EES 11]
<p>Quizzes (In-class or online) - 10%</p>	<ul style="list-style-type: none"> • Use standard Linux commands - [CLR 1] • Installing Linux - [CLR 2] • Create and manage a file system under Linux. - [CLR 3] • Create and manage user accounts and access control in a Linux-based environment - [CLR 4] • Install and configure software in a Linux-based environment. - [CLR 5] • Manage the boot process under Linux. - [CLR 6] • Respond to written, spoken or visual messages in a manner that ensures effective communication. - [EES 2] • Apply a systematic approach to solve problems. - [EES 4] • Use a variety of thinking skills to anticipate and solve problems. - [EES 5] • Take responsibility for one's own actions, decisions and consequences. - [EES 11]

COLLEGE GRADING NUMERICAL EQUIVALENT TABLE

Final Grade	Mark Equivalent	Numeric Value	Final Grade	Mark Equivalent	Numeric Value
A+	90-100%	4.0	C+	67-69%	2.3
A	85-89%	3.8	C	63-66%	2.0
A-	80-84%	3.6	C-	60-62%	1.7
B+	77-79%	3.3	D+	57-59%	1.4
B	73-76%	3.0	D	53-56%	1.2
B-	70-72%	2.7	D-	50-52%	1.0
			F	0-49%	0
			FSP	0	0

PRIOR LEARNING ASSESSMENT AND RECOGNITION

Students who wish to apply for prior learning assessment and recognition (PLAR) need to demonstrate competency at a post-secondary level in all of the course learning requirements outlined above. Evidence of learning achievement for PLAR candidates includes:

- Challenge Exam
- Performance Test

RELATED INFORMATION

The following information is course-specific:

The following will provide evidence of your learning achievement:

Assessment of student learning will be done by means of three class tests/quizzes, final exam and laboratory assignments.

Labs:

Laboratory attendance for this course is **compulsory**, and **absence from more than 2 labs without the prior consent of the professor** will result in a final grade of "F". Students are responsible for keeping a record of the number of laboratory sessions they have missed.

Lab evaluation is conducted by the Lab Professor, and submitted to the final grade roll-up as a mark out of 25.

All laboratory assignments must be successfully completed in order to obtain course credit. Late assignments will be penalized and receive a mark of zero, but they must still be completed. Any missed evaluation points will result in a grade of "0". In the case of a documented emergency the professor, in consultation with the Chair, will determine how the marks will be made up and/or final grade adjusted.

Theory:

Term Tests and Final Exam will be conducted on the theory covered in lectures, material covered in the lab as well as any additional material indicated by the Professor.

Marks for lab assignments will not be included in the final grade unless the student achieves at least a grade of 50 % or "D-" on the combined tests/quizzes and final exam. Students who have a failing grade on the combined tests and the exam will receive a grade of "F".

The following information is program-specific:

0150X01FWO - Computer Systems Technician

Theory Evaluation:

Lab evaluation is conducted by the Lab Professor, and submitted to the final grade roll-up.

- Theory attendance, in-class quiz and tests may be a part of the course requirements, will be identified by your professor, and is unique to each individual course.
- All students are encouraged to prepare before class, attend class regularly, and actively participate while in class to enrich their learning experience.
- *It is important to note that there is NO REQUIREMENT to post any class notes or information to Blackboard. Any such information made available by professors is done solely to assist students in understanding the material presented and is not intended to replace attendance to theory class.*
- *Any and all information presented in class is considered testable material, be it presented verbally, written on the whiteboard, on-screen, or in a document - whether students were in attendance or not.*
- *It remains the student's responsibility to attend class. listen and take adequate notes, as needed.*

Lab Evaluation:

Lab evaluation is conducted by the Lab Professor, and submitted to the final grade roll-up. In this program, the following criteria may be required in

order to obtain a non-zero lab mark:

- Satisfactory attendance and participation in the lab;
 - **N.B:** *lab attendance requirements will be identified by your professor, and is specific to each individual course.*
- Satisfactory workmanship and behavior in the lab;
- Satisfactory adherence to rules prescribed for the lab facility;
- Being properly equipped & prepared for lab work prior to attending the lab;
 - **N.B.:** *coming to your lab period **without** the required equipment/tools or being prepared may result in you being marked as absent, at your professor's discretion.*
- Timely completion of individual labs and required work therein on the student's assigned lab computer, as prescribed by lab handouts.
 - *Late submission or extended deadlines may be afforded, along with associated penalties - these will be identified by your professor, and are specific to each individual course.*
 - *Work done outside of the lab environment may not be counted, unless indicated otherwise by your lab teacher.*

The Lab Professor reserves the right to suspend or deny access to the lab at any time if the above criteria are not being met. No allowances are made in the course for students whose access in the lab are suspended or denied.

Final Examination

All students are expected 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 your program coordinator no later than one week before final exams start, to allow for any special arrangements.

0150X03FWO - Computer Systems Technician

Lab Evaluation:

Lab evaluation is conducted by the Lab Professor, and submitted to the final grade roll-up. For this course, the following criteria must be satisfied in order to obtain a non-zero lab mark:

- Satisfactory attendance and participation in the lab
 - **N.B:** *absence from more than 2 labs without prior consent from the Professor may result in a final grade of "F" for the course, irrespective of your performance on the other portions of the course*
- Satisfactory workmanship and behavior in the lab
- Satisfactory adherence to rules prescribed for the lab facility
- Being properly equipped & prepared for lab work prior to attending the lab
 - **N.B.:** *coming to lab without required equipment/tools or being prepared may result in you being marked as absent*
- Timely completion of individual labs and required work therein on the student's assigned lab computer, as prescribed by lab handouts. Work done outside of the lab environment will not be counted, unless indicated otherwise.

The lab Professor reserves the right to suspend or deny access to the lab at any time if the above criteria are not being met. No allowances are made in the course for students whose access in the lab are suspended or denied.

Final Examination

All students are expected 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.

0155X01FWO - Computer Systems Technology - Networking

Theory Evaluation:

Lab evaluation is conducted by the Lab Professor, and submitted to the final grade roll-up.

- Theory attendance, in-class quiz and tests may be a part of the course requirements, will be identified by your professor, and is unique to each individual course.
- All students are encouraged to prepare before class, attend class regularly, and actively participate while in class to enrich their learning experience.
- *It is important to note that there is NO REQUIREMENT to post any class notes or information to Blackboard. Any such information made available by professors is done solely to assist students in understanding the material presented **and is not intended to replace attendance to theory class.***
- *Any and all information presented in class is considered testable material, be it presented verbally, written on the whiteboard, on-screen, or in a document - whether students were in attendance or not.*
- *It remains the student's responsibility to attend class. listen and take adequate notes, as needed.*

Lab Evaluation:

Lab evaluation is conducted by the Lab Professor, and submitted to the final grade roll-up. In this program, the following criteria may be required in order to obtain a non-zero lab mark:

- Satisfactory attendance and participation in the lab;
 - **N.B:** *lab attendance requirements will be identified by your professor, and is specific to each individual course.*
- Satisfactory workmanship and behavior in the lab;
- Satisfactory adherence to rules prescribed for the lab facility;
- Being properly equipped & prepared for lab work prior to attending the lab;

- o **N.B.:** coming to your lab period **without** the required equipment/tools or being prepared may result in you being marked as absent, at your professor's discretion.
- Timely completion of individual labs and required work therein on the student's assigned lab computer, as prescribed by lab handouts.
 - o Late submission or extended deadlines may be afforded, along with associated penalties - these will be identified by your professor, and are specific to each individual course.
 - o Work done outside of the lab environment may not be counted, unless indicated otherwise by your lab teacher.

The lab Professor reserves the right to suspend or deny access to the lab at any time if the above criteria are not being met. No allowances are made in the course for students whose access in the lab are suspended or denied.

Final Examination

All students are expected 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 your program coordinator no later than one week before final exams start, to allow for any special arrangements.

0156X01FWO - Computer Systems Technology - Security

Lab Evaluation:

Lab evaluation is conducted by the Lab Professor, and submitted to the final grade roll-up. For this course, the following criteria must be satisfied in order to obtain a non-zero lab mark:

- Satisfactory attendance and participation in the lab
 - o **N.B.:** absence from more than 2 labs without prior consent from the Professor may result in a final grade of "F" for the course, irrespective of your performance on the other portions of the course
- Satisfactory workmanship and behavior in the lab
- Satisfactory adherence to rules prescribed for the lab facility
- Being properly equipped & prepared for lab work prior to attending the lab
 - o **N.B.:** coming to lab without required equipment/tools or being prepared may result in you being marked as absent
- Timely completion of individual labs and required work therein on the student's assigned lab computer, as prescribed by lab handouts. Work done outside of the lab environment will not be counted, unless indicated otherwise.

The lab Professor reserves the right to suspend or deny access to the lab at any time if the above criteria are not being met. No allowances are made in the course for students whose access in the lab are suspended or denied.

Final Examination

All students are expected 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.

The following information is school/department-specific:

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.

Harassment/Discrimination/Violence will not be tolerated. Any form of harassment (sexual, racial, gender or disability-related), discrimination (direct or indirect), or violence, whether involving a professor and a student 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.

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://laws.justice.gc.ca/en/C-42> . 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.

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 every 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.

The following information is College-wide:

Email

Algonquin College provides all full-time students with an e-mail 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 e-mail using your Algonquin account and to check it regularly.

Centre for Students with Disabilities (CSD)

If you are a student with a disability, it is strongly recommended that you identify your needs to the professor and the Centre for Students with Disabilities (CSD) by the end of the first month of the semester in order that any necessary support services can be arranged for you.

Academic Integrity*

Adherence to acceptable standards of academic honesty is an important aspect of the learning process at Algonquin College. Academic work submitted by a student is evaluated on the assumption that the work presented by the student is his or her own, unless designated otherwise. For further details consult Algonquin College Policies AA 18(http://www2.algonquincollege.com/directives/files/2011/01/AA-18-Academic-Dishonesty-and-Discipline.PEC_Approved.-Oct.27.2010.pdf) and E43 (<http://www2.algonquincollege.com/directives/files/2011/05/E431.pdf>)

Course Assessments*

It is Algonquin College's policy to give students the opportunity to complete a course assessment survey in each course that they take which solicits their views regarding the curriculum, the professor and the facilities. For further details consult Algonquin College Directive E38 (<http://www2.algonquincollege.com/directives/files/2010/09/E38.pdf>)

Use of Electronic Devices*

With the proliferation of small, personal electronic devices used for communications and data storage, Algonquin College believes there is a need to address their use during classes and examinations. During classes, the use of such devices is disruptive and disrespectful to others. During examinations, the use of such devices may facilitate cheating. For further details consult Algonquin College Directive E39 (<http://www2.algonquincollege.com/directives/files/2010/09/E39.pdf>)

Transfer of Credit

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

* College policies (previously called directives) are under review and redesign. The term *directives* is being retired. As such, the policy classification nomenclature is in transition. Students, it is your responsibility to refer to the Algonquin College Directives/Policies website for the most current information available at: (<http://www2.algonquincollege.com/directives/>)