Computer and Internet Fundamentals

Information and Communications Technology

Course Number: CST8281	**Contribution to Program:** Vocational Core	**Normative Hours:** 60
Applicable Program(s): 0336X01FWO Computer Programmer	**AAL:** 2	**Approval Date:** 24/08/2011
Prepared by: Ian D. Allen Professor		**Approved by:** Andrew Pridham Academic Chair, ICT
Co-Requisites N/A		**Approved for Academic Year:** 2011-2012
Pre-Requisites CST8201		

COURSE DESCRIPTION

This introductory course focuses on fundamental concepts and terminology related to the computer and its use. Topics include security, mathematical concepts relevant to basic computer operation and programming (including number systems and Boolean/logical operations), and basic Internet usage (including FTP, HTML and web fundamentals).

RELATIONSHIP TO VOCATIONAL LEARNING OUTCOMES

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

Computer Programmer 0336X01FWO

2	Develop, test, document, deploy, and maintain secure program code based on specifications.(T,A)
8	Conform to workplace expectations found in information technology (IT) environments.(T,A)

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:

1	Communicate clearly, concisely and correctly in the written, spoken and visual form that fulfills the purpose and meets the needs of the audience.(A)
2	Respond to written, spoken or visual messages in a manner that ensures effective communication.(A)
3	Execute mathematical operations accurately.(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.(A)
10	Manage the use of time and other resources to complete projects.(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. Using terminology related to the computer and its use, describe the basic components of a computer and the underlying fundamental concepts.	• Assess the relative magnitudes of SI prefixes. • List the features and limitations of a vonNeumann architecture. • Break down a CPU into its basic components and describe each.

	• Enumerate the order-of-magnitude speeds of cache, memory, and disk operations. • Outline the memory hierarchy from fastest memory to slowest. • Describe how Virtual Memory works and the impact of excessive page faults (thrashing) on program execution. • Structure code to make best use of cache and memory working set. • Define the areas of responsibility of standards bodies such as ISO and IETF.
2. Perform mathematical operations relevant to basic computer operation and programming, including conversions between number systems and manipulation of Boolean/logical expressions.	• Use exponential notation for both decimal and binary numbers. • Recognize and convert between different representation of negative integers. • Assess two's-complement arithmetic for overflow. • Avoid the "zero hole" for floating-point operations. • Choose an appropriate numeric type (integer/float) for storing information. • Describe the internal structure of integers and IEEE 754 floating-point numbers. • Convert numbers between binary, octal, decimal, and hexadecimal bases. • Locate information in a hexadecimal computer memory dump. • Adjust byte order to conform to the Endian-ness of the hardware. • Assess the safety and security of mathematical operations with respect to overflow/underflow. • Simplify programming logic Boolean expressions using identities and deMorgan. • Create truth tables for Boolean expressions. • Translate between ASCII letter/number codes and text. • Relate ASCII to Latin-1 to Unicode character sets. • Calculate even and odd parity.
3. Use the Internet, including FTP and HTML/Web fundamentals.	• Define the Internet Robustness Principle. • Know which standards body is in charge of Internet protocols. • Identify a valid IP address and TCP/UDP port number. • Construct a valid URI/URL for HTTP and EMail targets. • Know which parts of URI/URLs are case-sensitive. • Convert IP addresses between dotted-quad and 32-bit integer form. • Use insecure FTP and secure SFTP and SCP to transfer files between computers. • Use a secure login program (e.g. PuTTY, SSH) to log in to a remote Linux system. • Manipulate permissions and locations of HTML and CSS files on a server. • Create a valid HTML 4.01 Strict web page. • Use Cascading Style Sheets to change the appearance of a web page. • Validate an HTML page to W3C HTML 4.01 Strict standards. • Validate a CSS page to W3C standards.

	• Use Firefox Web Developer add-ons to increase development productivity. • Search HTML and CSS tutorial sites for documentation on web page design.

LEARNING RESOURCES

The course has no paper textbook. There is nothing to purchase. On-line materials will be made available via Blackboard.

A small set of restricted-distribution slides is available on Blackboard. All Blackboard courses eventually close, usually at the end of term, and the slides will cease to be available. Students must copy to their own computers any content they might need from Blackboard before the course closes. Nothing on Blackboard is searchable from Google or from the College home page.

LEARNING ACTIVITIES

During this course, you are likely to experience the following learning activities:
The course is delivered using two hours of lectures and two hours of lab per week. Students are expected to attend all lectures and labs. You will need to spend an additional 3 hours per week, on average, of your own time for assignments and study outside of lecture and lab time.

Lectures will present the theoretical material of the course, followed by laboratory assignments based on that material, followed by midterm and exam tests that test the understanding of that material.

On-line materials are available for most (but not all) of the lecture and lab content. The professor will not repeat a lecture; students must make up for missed lectures by getting in-class notes from other students.

Students are encouraged to ask questions at any time and to consult with the professor on topics that they do not clearly understand. Professors will inform students at the beginning of the course (and on-line) of suitable times for longer in-office consultations.

Laboratory assignments will be closely integrated with the lecture material. Tests and exams will have the bulk of their material taken directly from the lab assignments. Students' ability to successfully complete the assigned exercises will directly correlate with their level of success on tests and the final exam.

There is no textbook in this course. What would normally be assigned as textbook readings will be assigned as on-line notes and Internet readings. Learning HTML and Web Design is best done interactively, and students will be referred to excellent on-line resources and tutorials.

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:**
Assignments (20%): Assignments are presented approximately one per week. Not every assignment may be marked, but every assignment contains material that may appear on a later test or exam. Late assignments may be docked a mark penalty worth up to the full value of the assignment. Don't be late.	• Using terminology related to the computer and its use, describe the basic components of a computer and the underlying fundamental concepts. - [CLR 1] • Perform mathematical operations relevant to basic computer operation and programming, including conversions between number systems and manipulation of Boolean/logical expressions. - [CLR 2] • Use the Internet, including FTP and HTML/Web fundamentals. - [CLR 3] • Communicate clearly, concisely and correctly in the written, spoken and visual form that fulfills the purpose and meets the needs of the audience. - [EES 1] • Respond to written, spoken or visual messages in a manner that ensures effective communication. - [EES 2] • Execute mathematical operations accurately. - [EES 3] • 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] • Manage the use of time and other resources to complete projects. - [EES 10] • Take responsibility for one's own actions, decisions and

	consequences. - [EES 11]
Midterm Tests (15% and 20%): Material for each midterm test comes largely from questions already given in the weekly assignments.	• Using terminology related to the computer and its use, describe the basic components of a computer and the underlying fundamental concepts. - [CLR 1] • Perform mathematical operations relevant to basic computer operation and programming, including conversions between number systems and manipulation of Boolean/logical expressions. - [CLR 2] • Use the Internet, including FTP and HTML/Web fundamentals. - [CLR 3] • Communicate clearly, concisely and correctly in the written, spoken and visual form that fulfills the purpose and meets the needs of the audience. - [EES 1] • Respond to written, spoken or visual messages in a manner that ensures effective communication. - [EES 2] • Execute mathematical operations accurately. - [EES 3] • 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] • Manage the use of time and other resources to complete projects. - [EES 10] • Take responsibility for one's own actions, decisions and consequences. - [EES 11]
Final Exam (35%): Material for the final exam comes largely from questions already given in the weekly assignments. 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 your course professor no later than one week before final exams start, to allow for any special arrangements.	• Using terminology related to the computer and its use, describe the basic components of a computer and the underlying fundamental concepts. - [CLR 1] • Perform mathematical operations relevant to basic computer operation and programming, including conversions between number systems and manipulation of Boolean/logical expressions. - [CLR 2] • Use the Internet, including FTP and HTML/Web fundamentals. - [CLR 3] • Communicate clearly, concisely and correctly in the written, spoken and visual form that fulfills the purpose and meets the needs of the audience. - [EES 1] • Respond to written, spoken or visual messages in a manner that ensures effective communication. - [EES 2] • Execute mathematical operations accurately. - [EES 3] • 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] • Manage the use of time and other resources to complete projects. - [EES 10] • Take responsibility for one's own actions, decisions and consequences. - [EES 11]
Participation (10%): Opportunities will be given throughout the term for "participation" marks. Assignments, even late assignments, may be self-marked for credit.	• Communicate clearly, concisely and correctly in the written, spoken and visual form that fulfills the purpose and meets the needs of the audience. - [EES 1]

	• Respond to written, spoken or visual messages in a manner that ensures effective communication. - [EES 2] • Take responsibility for one's own actions, decisions and consequences. - [EES 11]
Notes: Laboratory attendance is recorded and recommended, but is not compulsory. Lecture attendance is recommended but is not recorded. Any missed evaluation points will result in a grade of zero. 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.	• Manage the use of time and other resources to complete projects. - [EES 10] • 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
- Project/Assignment

RELATED INFORMATION

The following information is course-specific:

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 – E43 in your Instaguide, and the School of Advanced Technology's Standard Operating Procedure on Plagiarism and Academic Dishonesty.

The following information is program-specific:

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/)**