ALGONQUIN COLLEGE

Computer Systems Architecture

SCHOOL OF ADVANCED TECHNOLOGY

Course Number: DAT2343	**Contribution to Program:** Vocational Core	**Normative Hours:** 60
Applicable Program(s):	**AAL:**	**Approval Date:** 28/09/2010
0336X01FWO Computer Programmer	4	
0336X03FWO Computer Programmer	4	
Prepared by: Ian D. Allen - alleni@algonquincollege.com Professor		**Approved by:** Andrew Pridham Academic Chair, Computer Studies
Co-Requisites N/A		**Approved for Academic Year:** 2010-2011
Pre-Requisites CST8281		

COURSE DESCRIPTION

This course provides students with a basic understanding of computer architecture. The focus of the course is on hardware and its functions, internal encoding of data and instructions, logic circuits, microprocessor instruction execution, levels of computer languages and how they are processed. Basic assembler simulation provides a practical application.

RELATIONSHIP TO VOCATIONAL LEARNING OUTCOMES

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

Computer Programmer 0336X01FWO

8	Conform to workplace expectations found in information technology (IT) environments.(T,A)

Computer Programmer 0336X03FWO

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:

3	Execute mathematical operations accurately.(CP)
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.(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. describe the function of computer hardware related to executing programs	• describe component parts of CPUs. • apply knowledge of how a CPU executes instructions.
2. Explain the relationship between various levels of computer languages and language processing.	• differentiate between compilers and assemblers. • describe the functions of linkers and loaders.

	• perform low level (simulated assembly language) coding.
3. Demonstrate facility with numbering systems.	• add and subtract in decimal, binary and hexadecimal bases. Perform conversion between the bases.
4. Identify and explain the different systems of data representation and discuss their implications on program design.	• describe numeric data encoding using unsigned binary, 2's complement, and IEEE floating point. • encode/decode character data using ASCII; describe how ASCII relates to Unicode

LEARNING RESOURCES

The course has no textbook. There is nothing to purchase.

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.

An unrestricted set of Class Notes is available via multiple public web sites: http://teaching.idallen.com/dat2343/10f/, http://teaching.idallen.org/dat2343/10f/, http://acadunix.algonquincollege.com/~alleni/teaching/dat2343/10f/, and http://elearning.algonquincollege.com/coursemat/alleni/idallen/dat2343/10f/. All these web sites are public and the intent is that they will be available even after the course is finished and you lose access to Blackboard. Since these sites are public, material in these sites is archived and indexed by Google and other search engines; material on Blackboard is not.

LEARNING ACTIVITIES

During this course, you are likely to experience the following learning activities:
The course is delivered using three hours of in-class lectures and one hour of hybrid (online) lecture per week. Students are expected to attend all lectures. You will need to spend an additional 3-4 hours per week, on average, of your own time for assignments and study outside of lecture time.

Lectures will present the theoretical material of the course, followed by homework 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 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.

Homework and Assignments will be closely integrated with the lecture material. Tests and exams will have the bulk of their material taken directly from the homework 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. 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:
Homework Exercises / Assignments / Projects (25%): Homework, in the form of exercises, assignments, and small projects to be picked-up from the web and answered and submitted electronically, will be assigned approximately weekly. 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.	• describe the function of computer hardware related to executing programs - [CLR 1] • Explain the relationship between various levels of computer languages and language processing. - [CLR 2] • Demonstrate facility with numbering systems. - [CLR 3] • Identify and explain the different systems of data representation and discuss their implications on program design. - [CLR 4] • 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.	• describe the function of computer hardware related to executing programs - [CLR 1]
	• Explain the relationship between various levels of computer languages and language processing. - [CLR 2]
	• Demonstrate facility with numbering systems. - [CLR 3]
	• Identify and explain the different systems of data representation and discuss their implications on program design. - [CLR 4]
	• 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 (30%): 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.	• describe the function of computer hardware related to executing programs - [CLR 1]
	• Explain the relationship between various levels of computer languages and language processing. - [CLR 2]
	• Demonstrate facility with numbering systems. - [CLR 3]
	• Identify and explain the different systems of data representation and discuss their implications on program design. - [CLR 4]
	• 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]
Course Feedback and Participation (10%): Opportunities will be given throughout the term for feedback and participation marks. You will be self-grading many of your assignments as credit toward this mark. Assignments, even late assignments, may be self-marked for credit.	• 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]
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	• Manage the use of time and other resources to complete projects. - [EES 10]

determine how the marks will be made up and/or final grade adjusted.	• 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

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.

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 Directives
E16 (http://www.algonquincollege.com/directives/sectionE/E16.pdf)
and E43 (http://www.algonquincollege.com/directives/sectionE/E43.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://www.algonquincollege.com/directives/sectionE/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://www.algonquincollege.com/directives/sectionE/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.