



COURSE OUTLINE

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Course Name: Introduction to Computer Design

Department Head/Coordinator: Andy Sellwood

Effective Date: September 2015

School or Centre:		Department:
School of Arts and Science		Science
Course History:		Year of Study:
New Course		1st Year Post-secondary
Name of Replacing Course (if applicable):	Course Number:	SCIE 1020
	Number of Credits:	3.0

Course Pre-requisites (if applicable):

Discrete Mathematics (MATH 1120) with a C- and Introduction to Computer Programming 1 (CMPT 1010) with a C-.

Course Co-requisites (if applicable):

PLAR (Prior Learning Assessment & Recognition)

No Yes (details below):

Course Description:

This course introduces students to digital design concepts, focusing on how basic logic blocks of a simple computer are designed. Topics covered include: basic Von Neumann computer architecture; an introduction to assembly language programming; combinational logic design; and sequential logic design.

Note to instructors: An instructional strategy is an approach that an instructor uses to achieve the learning outcomes (e.g., lecture, case study, video, group work).

Instructional Strategies:

Lectures and labs.

Course Learning Outcomes:

Upon successful completion of this course students will be able to:

- Use black boxes to represent functional components of circuits
- Use an ECAD tool, such as Designworks, for schematic entry and simulation of both combinational and sequential circuits.
- Define and explain both the purpose and function of the typical components of a simple computer: CPU (registers, ALU, control unit), RAM, ROM, bus.
- Describe the basic fetch/execute cycle with reference to the components listed above, and a variety of assembly level instructions.
- Explain the control unit algorithm: fetch-decode-execute.
- Explain the von Neumann architecture and its significance.
- Apply binary to computer design.
- Write programs in an assembly language.
- Design combinational circuits.
- Design sequential circuits.
- Design the components of a datapath.

Program Learning Outcomes:

If this course is taken as a requirement or an elective in the following first year, University Transfer Certificate program, the learning outcomes are found in the relevant Program Content Guides available at the Counselling and Advising Service areas.

University Transfer Computing Science and Software Systems Certificate

Evaluation/Grading System *(Click on drop down box arrows to see list of options)*

Grading System	Specify if 'Other':	Specify Passing Grade:
Letter Grades		D

Components and Weighting of the Assessment/Evaluation Plan: *(Click on drop down box arrows to see list of options)*

Type	Percentage	Evaluation Plan (provide a brief explanation for each component especially if value exceeds 35%):
Assignments	30	
Midterm Exam	35	3 midterms
Final Exam	35	
	Total	100

Learning Environment/Type *(Select all that are used within the course)*

Instruction Type	Hours Per Instruction Type	Comments
L - Classroom	45	
B - Lab (Computer, Chemistry...)	15	
Enter Total Hours	60	

Resource Material(s):

Resources are items in addition to tuition that the student is responsible for purchasing. Course resource information will be supplied by the department/instructor.

Course Topics and Sequence Covered:

- Encoding systems for numbers and characters. Intro. to Boolean Algebra
- Combinational logic design using gates, adders, decoders, multiplexers, ALU's, etc.
- Sequential logic design using flip-flops, registers etc. Intro. to finite state machines.
- Introduction to Memory devices: read-only memory (ROM), random access memory (RAM).
- Introduction to basic CPU architecture, addressing modes and program execution.
- Introduction to assembly language programming; branching, iteration, subroutines.

VCC Education and Education Support Policies

There are a number of **Education** and **Education Support** policies that govern your educational experience at VCC, please familiarize yourself with them.

The policies are located on the VCC web site at:

<http://www.vcc.ca/about/governance--policies/policies/>

To find out how this course transfers, visit the BC Transfer Guide at www.bctransferguide.ca.

FOR COMMITTEE USE ONLY

Date Approved by Education Council:		Date Approved by VCC Board (if applicable):	
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