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# CMPT 1010: Introduction to Computer Programming 1

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## EFFECTIVE DATE

September 2020

## DEPARTMENT

UT Computing Science&Software

## DESCRIPTION

This course provides students an introduction to computing science and computer programming, using a systems oriented language, such as C or C++. This course introduces basic computing science concepts. Topics will include: elementary data types, control structures, functions, arrays and strings, fundamental algorithms, computer organization and memory management.

## CREDITS

3.0

## YEAR OF STUDY

1st Year Post-secondary

## PREREQUISITES

Pre-calculus 12 or MATH 1020 Precalculus or MATH 0983/0993 Math Parts 1 & 2 or VCC Math Pre-calculus Assessment Test with a minimum grade of '72%' or equivalent

## COREQUISITES

None

## COURSE LEARNING OUTCOMES

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

- Identify different data types and describe the appropriate application of primitive data types.
- Analyze and design a C++ program that uses variables, operators, expressions, console input/output, file input/output, conditional structures, and/or iterative structures.
- Explain the importance of modularization and write reusable code using functions.
- Write a program that uses data structures such as arrays, strings, structures, and enumerated data types.
- Explain the concept of pointers and use them to manage dynamic memory allocation in a program.
- Describe fundamental algorithms such as recursion and basic search and sort algorithms.
- Analyze, test, and debug programs for syntax, logic, and run-time errors.

- Apply consistent documentation and program style standards to create readable and maintainable software.

## PRIOR LEARNING ASSESSMENT & RECOGNITION (PLAR)

None

## HOURS

Lecture: 45

Lab: 15

## INSTRUCTIONAL STRATEGIES

Lectures and computer labs (and assignments).

## GRADING SYSTEM

Letter Grade (A-F)

## PASSING GRADE

D

## EVALUATION PLAN

Type	Percentage	Assessment activity
Participation	5	Computer lab participation
Assignments	25	Programming assignments
Final Exam	30	
Quizzes/Tests	40	2-3 tests

## COURSE TOPICS

- Introduction to computing systems and programming (programming languages, compilers, and interpreters; software development cycle; algorithm design and programming process; programming errors and code debugging; Integrated Development Environments)
- Programming Fundamentals (primitive data types; variables, literals, constants; identifier naming conventions; assignment operator; basic I/O and output formatting; expressions and arithmetic operators; type casting; comments and code documentation)
- Conditional structures and loops (decision-making structures; relational operators; logical operators; repetition structures and loop design strategies; nested constructs)
- Functions (defining and calling a function; local, global and static local variables; passing parameters by

- value and by reference; default arguments; function overloading; mathematical library functions)
- Recursion (problem solving using recursion; recursive vs iterative implementations)
- Arrays and C-strings (array basics; passing and returning arrays to/from functions; range-based for loop; multi-dimensional arrays; arrays of characters and c-strings; c-string and character manipulation library functions)
- Searching and sorting algorithms (basic searching algorithms; introduction to sorting algorithms)
- Pointers and dynamic memory allocation (pointer variables; pointers as function parameters and return values; dynamic memory allocation)
- Introduction to object-oriented programming (structures; classes and objects; member variables and functions; private vs private class members; class constructors, destructors and constructing objects; accessors and mutators; arrays of objects)
- File input/output (text files vs binary files; basic file operations)
- Program style standards (readable programs; documentation; software maintenance)

## LEARNING RESOURCES

None

Notes:

- Course contents and descriptions, offerings and schedules are subject to change without notice.
- Students are required to follow all College policies including ones that govern their educational experience at VCC. Policies are available on the VCC website at:  
<https://www.vcc.ca/about/governance--policies/policies/>.
- To find out how this course transfers, visit the BC Transfer Guide at <https://www.bctransferguide.ca>.

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### Downtown campus

250 West Pender Street  
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### Annacis Island campus

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