COMP 1020 - Introductory Computer Science 2

Calendar Description: More features of a procedural language, elements of programming (Lab required)
Prerequisite: Any one of COMP 1010, COMP 1011, COMP 1012, COMP 1013 (C) or both high school Computer Science 40S (75%) and any grade 12 or 40S mathematics or equivalent.
This course is a prerequisite for: COMP 2130, COMP 2140, COMP 2160, and COMP 2190.

Outline

1) Introduction (1 week)
    Review of COMP 1010 concepts: procedural programming, iterative development of "growing") algorithms, parallel arrays
2) File input and output (1 week)
    Character-oriented file I/O, line-oriented file I/O
3) Basic objects (1 week)
    Introduction to objects, constructors, variables, methods, representation of objects (object references/pointers)
4) Strings (1 week)
    Character manipulation, string manipulation, immutable objects
5) Object Collections (1 week)
    The ArrayList class, ArrayList operations
6) Object Inheritance (1 week)
    Object hierarchies, variable and method inheritance; shadowing and over-riding; polymorphism, the Object class; object cloning
7) Review (1 week)
    Finish inheritance and review first half of term, term test
8) Sorting (1 week)
    Bubble sort, selection sort, insertion sort
9) Recursion (1 week)
    Recursion: base case; recursive case
10) Multi-dimensional arrays (1 week)
    Simple introduction to multidimensional arrays (primarily two-dimensional)
11) Linked Lists (1 week)
    Organization of linked lists, linked lists using a Node class
12) Analysis of Algorithms (1 week)
    Introduction to analysis of algorithms, worst case $O(f(n))$, analysis of sorting algorithms and various other algorithms
13) Review (1 week)
    Review of course material

Text: David Scuse, *Growing Data Structures and Algorithms*, Course Notes