Concordia University
Department of Computer Science and Software Engineering
COMP 5421/1 BB – Advanced Programming
Summer 2018, May 2 – August 13
Course Outline

Lec BB	Wednesdays, 18:30-21:00, Room H431
Lab BBBI	Wednesdays, 14:45 – 16:35, Room H903
Lab BBBK	Wednesdays, 21:10 – 23:00, Room H929
Course TA	Yanal Alahmad, yanal.tg@gmail.com
Instructor	Sadegh Ghaderpanah, sadegh@cse.concordia.ca
Webpage	Moodle via the MyConcordia Portal

Course Description

This course provides students with a solid foundation for developing well-designed C++ programs using the object-oriented programming (OOP) paradigm. With emphasis on OOP principles and techniques, the course covers advanced C++ facilities including pointers and references, dynamic storage management, classes, operator overloading, function objects, lambda functions, inheritance, polymorphism, runtime type information, exception handling, I/O streams, templates, the C++ Standard Template Libraries (STL), and generic programming.

Prerequisites

COMP 5511 Principles of Data Structures

This course assumes students are familiar with basic principles of computer programming and with basic data structures. Specifically, familiarity with programming constructs such as data types, strings, numbers, objects, control flow, functions, argument passing, classes, arrays, and data structures such as lists, stacks, queues, recursion, and sorting algorithms such as quick sort, insertion sort, merge sort, selection sort.

Course Schedule

A weekly course schedule is posted on Moodle. The course schedule is tentative and may shift or change depending on how quickly we proceed.

Specific textbook chapters to be covered each week are indicated in the course schedule. Please note that the textbook chapters are not covered sequentially but are covered selectively according to the topics of each week.

To provide an overview of the contents of the chapters indicated in the course schedule, a copy of table of contents of the course textbook is also posted on Moodle.

Textbook

C++ How to Program, 10/e, Deitel & Deitel, Prentice Hall, 2017, ISBN:9780134448237

This is an intermediate level textbook that contains all the topics of interest in this course. Note that there are eText, loose-leaf and bounded versions of this title.

References and other useful resources are listed on the course Moodle page.

Assignments

There will be a maximum of five assignments, each with a fair amount of programming. Assignments are due by the date and time specified. Late assignments will be penalized by 10% per day for the first five days that the assignment is late. An assignments submitted more than five days late will receive a grade of 0.

Term Exams

There will be a mid-term exam and a final exam. The date, time, and place for the exams will be confirmed in class at least one week prior to each exam. Important tentative dates for the course are:

Wednesday, June 13	Mid-term exam
Wednesday, June 20	Mid-term break, no class
Wednesday, August 8	Final Exam

Evaluation Scheme

Assignments:	25%
Midterm Exam:	35%
Final Exam:	40%

To pass the course, students must obtain passing marks in each of the term components: assignments and the two term exams. Please note that *there is no standard relationship between the numerical percentages and the final letter grades given, except that higher percentages map into equal or higher grades.*

Criteria used in evaluation of a programming assignment

- Correctness and Testing: the program should conform to the functional requirements outlined in the assignment text, produce correct results, and handle special cases and error conditions. The submitted test cases take into consideration special cases and error conditions.
- Efficiency: the program must use suitable algorithms.
- Design: the program should be constructed from coherent modules, minimize dependencies, and hide as much information as possible.
- Documentation: the documentation should include concise description of your design and the algorithms implemented. Helpful identifiers and a clear layout are part of documentation.
- User Interface: the program should be easy to use.
- Style: the program should be well-organized and in a good style.

Assignment Submission

1. For each assignment, create an *assignment folder* named *A#_StudentID*, where *#* denotes the assignment number and *StudentID* denotes your student ID number. For example, student *7654321* would create assignment folders named *A1_7654321*, *A2_7654321*, *A3_7654321*, and so on.
2. Place the implementation (`.cpp`) files, header (`.h`) files, and input/output files for your assignment in your *A#_StudentID* assignment folder.

   Do *not* submit any IDE generated files as their large size may saturate your overall upload storage quota.

   Regardless of the C++ IDE you use to develop your programs, be sure that the course marker can compile and run your programs on the computers in ENCS computer labs.
3. Place a `README.txt` text file in your folder; it should contain:
   (a) the assignment number
   (b) your name and ID,
   (c) any special instructions on how to run and use your program,
   (d) a list of extra features (if any) in your program,
   (e) a list of any known bugs (if any) in your program, and
   (f) any notes you wish the TA/instructor to consider while grading.
4. Compress (Zip) your *A#_StudentID* folder to a file named *A#_StudentID.zip*.
5. Submit the resulting zipped file *A#_StudentID.zip* at the course Moodle page. You may submit your assignment only once, so make sure it is your final copy.
6. Retain a copy of all your term work until you receive a final grade for the course.

Computer Labs

To complete the course assignments, you can use the computer lab assigned to you when you registered for the course. If you do not have a computer account, you can obtain one from Instructional and Information Technology Services (IITS) in H925. You can also complete the course assignments on your own computer, but be aware of compatibility issues between your C++ compiler and Microsoft's VC++ 2013 (or later) on the computers in ENCS labs.

C++ Compilers

You can use any C++ compliant compiler, including those listed below. However, regardless of the compiler you use, your programs (*.cpp and *.h) must compile and run within the VC++ IDE available on the computers in ENCS computer labs. The goal here is to promote writing portable programs, which in turn facilitates the task of marking your programs. Therefore, you must avoid using non-standard C++ features of your C++ compiler/IDE.

- Microsoft Visual Studio Express (Visual Studio Community)
  `https://www.visualstudio.com/en-US/products/visual-studio-express-vs`
- Apple C++ `https://developer.apple.com/xcode/`
- CLion `https://www.jetbrains.com/`
- Cygwin (GNU C++) `http://www.cygwin.com/`

- MINGW - "Minimalist GNU for Windows http://www.mingw.org/

Class Recording Policy

Students are not permitted to make audio or video recordings in this course.

Disability requests

Please let your instructor know if you have a disability which requires special arrangements.

Code of Conduct

While discussion amongst students are permitted, all write-ups and programming must be done independently. Students should be aware of the University's code of conduct (academic) as specified in section 16.3.13 of the 2001/2002 Undergraduate Calendar, especially the parts concerning cheating, plagiarism and the possible consequence of violating this code.

Rights and Responsibilities

The most common offense under the Academic Code of Conduct is plagiarism which the Code defines as "*the presentation of the work of another person as one's own or without proper acknowledgement.*"

This could be material copied word for word from books, journals, Internet sites, professor's course notes, etc. It could be material that is paraphrased but closely resembles the original source. It could be the work of a fellow student, for example, an answer on a quiz, data for a lab report, a paper or assignment completed by another student. It might be a paper purchased through one of the many available sources. Plagiarism does not refer to words alone - it can also refer to copying images, graphs, tables, and ideas. "Presentation" is not limited to written work. It also includes oral presentations, computer assignments and artistic works. Finally, if you translate the work of another person into French or English and do not cite the source, this is also plagiarism.

In Simple Words: *Do not copy, paraphrase or translate anything from anywhere without saying where you obtained it!*

(Source: The Academic Integrity Website:
http://provost.concordia.ca/academicintegrity/plagiarism/)

List of Services

- Concordia Counselling and Development offers career services, psychological services, student learning services, etc. http://cdev.concordia.ca/
- The Concordia Library Citation and Style Guides: http://library.concordia.ca/help/howto/citations.html
- Advocacy and Support Services http://supportservices.concordia.ca/
- Student Transition Centre http://stc.concordia.ca/
- New Student Program http://newstudent.concordia.ca/
- Access Centre for Students with Disabilities http://supportservices.concordia.ca/disabilities/

- Student Success Centre http://studentsuccess.concordia.ca/
- The Academic Integrity Website http://provost.concordia.ca/academicintegrity/
- Financial Aid & Awards http://web2.concordia.ca/financialaid/
- Health Services http://www-health.concordia.ca/