COMP 2404 B (Nel) Fall 2019

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Instructor: Louis Nel (http://www.scs.carleton.ca/%7Eldnel)
Prof. Nel's Lecture Notes (notes)
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USEFUL LINKS:

culearn (http://www.carleton.ca/culearn)
C++ API reference (http://www.cplusplus.com/reference)
w3schools (https://www.w3schools.com/)
codecademy (https://www.codecademy.com/catalog/subject/web-development)
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COMP 2404 Introduction to Software Engineering

COURSE OUTLINE

| Lectures | Mon, Wed 2:30-4:00 AT302 |
Calendar Description:

Introduction to object-oriented software development, with emphasis on design and implementation of medium-sized programs. Topics include abstraction, modularity, encapsulation, reusability, and design patterns.

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Precludes additional credit for COMP 2004 (no longer offered), SYSC 3010, SYSC 3110. Prerequisite(s): One of COMP 1406, COMP 1006 or SYSC 2004, with a minimum grade of C-. Students in the industrial applications internship option register in COMP 2404 Z*.

Course Description:

This course is an in-depth study of the programming model represented in C++, with emphasis on features supporting the development of large, efficient, and reusable object-oriented systems. This course also introduces foundations of Software Engineering including requirements management, development processes, refactoring, workflows, version control and combining modeling with programming.

Topics:

The follow are the topics we covered in the last offering and will be adjusted and updated as the course proceeds.

- Software Engineering and Requirements Management
- Foundations of Software Development Processes
- Software and Data Modeling
- Refactoring and Design Patterns
- Workflow and Software Version Control
- Review of C, Java, C++ style Syntax and Basics Types
- Programming Model that C++ is based on
- Resource Management: memory allocation and de-allocation
- Classes and Inheritance
- Memory (Stack and Heap Based objects)
Functions and Function Pointers
Methods and Method Pointers
Scope Resolution Operator
Values, Pointers and References
Static and Dynamic Binding
Operator Overloading Constants
Construction, Destruction and Initialization
Containers and Iterators
Templates
Multiple Inheritance

Textbook:
Course lectures and assignments are based on lecture notes available on the website and online sources. There is not an official text for the course that you need to buy but you are encouraged to seek out online resources. Some recommended books and web sites will be listed in the resources section of the course website.

Course Material Copyright Notice:
We remind you that lectures and course materials, including power point presentations, outlines, code examples, and similar materials, are protected by copyright. The professor is typically the exclusive owner of copyright and intellectual property of the course materials unless otherwise noted. You may take notes and make copies of course materials for your own private (educational) use. You may not (and may not allow others to) reproduce or distribute lecture notes and course materials publicly for commercial purposes without my express written consent.

This notice has been added, in part, because course content has ended up on public sites like OneClass, Course Hero, or GitHub without permission. Many students are eager to post there work on GitHub but you must be careful not to include copyrighted material.

Software:
Our programming language for the course is C++. We are going to try and keep the course as OS agnostic as possible however restrictions might be imposed on the compiler used to evaluate your assignment code.

We have installed both the Visual Studio 2017 compiler and the GCC linux-based compiler on lab machines (HP 4155). Linux images are made available as Open Stack (cloud computing) images or as an image you can download and run locally on your own machine using Virtual Box. (see the course resources section for additional details). Be aware that part of the course requirements will be knowing how to use the compiler directly through command line interfaces (like the linux bash shell).

In addition we will likely make use of SQLite databases and the SQLite sqlite3.exe command shell tool for modeling and manipulating assignment data. You might need to learn a bit of SQL but not much. Again see the course website resources section for more details.

The assignments and tutorials all involve programming and some code modeling and documentation.

Tutorials:
This class has compulsory tutorials that you must attend once a week. The tutorials are an important part of the course and make up a substantial portion of the marks. The tutorial exercises will be posted ahead of time and you are expected to work on them before you come to the tutorial. At the tutorial you will demonstrate your results to the supervising TA’s and may be asked to make minor modifications to demonstrate your understanding.

Assignments:

We will be using electronic submission of assignments using Carleton’s culearn (https://culearn.carleton.ca) system. Electronic submission enforces strict deadlines. Only assignments submitted through culearn will be graded. No assignments will be accepted late or directly by email or in other forms. TA’s are not allowed to accept assignments directly.

Lab/TA Co-ordinator:

We have a lab/TA co-ordinator assigned to this course offering.

The lab coordinator is responsible for organizing and overseeing the tutorial sections of the course and also imposing submission rules to help ensure that marking goes smoothly. If you notice any mistakes within a tutorial, have issues with a tutorial teaching assistant, or have any other tutorial related questions, the lab coordinator should be your first point of contact. The lab coordinator is also responsible for distributing assignments to teaching assistants for evaluation. If you are missing an assignment grade or are unsure about the status of your assignment, you can contact the lab coordinator.

Teaching Assistants:

A schedule for TAs will be posted on culearn and on the course website.

Marking Scheme:

<table>
<thead>
<tr>
<th>deliverable</th>
<th>value</th>
<th>comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tutorials</td>
<td>25%</td>
<td>10 tutorials. Count best 8/10 (completed individually)</td>
</tr>
<tr>
<td>Assignments</td>
<td>30%</td>
<td>4,5, or 6 assignments equally weighted. You may work in pairs on assignments if you want. Count all but worst one assignment.</td>
</tr>
<tr>
<td>Midterm</td>
<td>10%</td>
<td>In class (Thu. Nov. 1 in class). (If your final exam mark is better than the midterm mark, the midterm mark will be replaced by the final exam mark)</td>
</tr>
<tr>
<td>Final Exam</td>
<td>35%</td>
<td>Formally scheduled exam during exam period</td>
</tr>
</tbody>
</table>

Missed assignments: You may miss up to 2 tutorials, 1 assignment and the midterm test for medical, compassionate, or other reasons. If you miss more than that a mark of 0 will be used for the missed items when the final grade is computed. We will NOT collect doctor’s notes for missed work; if you miss more than the allowed number a mark of 0 will be used for the missed work.
If your final exam mark is better than the midterm mark we will replace the midterm mark with the final exam mark. You do NOT need to supply a doctor’s note if you miss the midterm. Midterm or Exam marks will not be used to make up for missed, or poorly done, assignments or tutorials.

IMPORTANT: If you wish to appeal a mark (assignment, tutorial or midterm) you must make the appeal within 10 days of the mark being posted on culearn. After that we will not be obliged to accept appeals or change marks.

Collaboration is encouraged but cheating, or copying, is not allowed. You may work together and consult but any work you hand in must be your own and judged to be unique. Any two assignments judged to be too similar will both receive a grade of 0, and will be handled as a formal academic offence -see calendar for details. If you are working with a partner on assignments you must submit only one copy but have both your names on the assignment.

Course Web Page:

As well as being announced in class, all important information, such as course news, assignments, TA hours, instructor office hours, will be available on the course web page at http://www.scs.carleton.ca/~ldnel/2404fall2019. It is your responsibility to check this web page frequently for new information and announcements. Paper copies of outlines and assignments will not be provided. We will not send mass emails for routine announcements -emails will be used for exceptional circumstances.

Information on University Academic Accommodations

Requests for Academic Accommodation

You may need special arrangements to meet your academic obligations during the term. For an accommodation request, the processes are as follows:

Pregnancy obligation

Please contact your instructor with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details, visit the Equity Services website: carleton.ca/equity/wp-content/uploads/Student-Guide-to-Academic-Accommodation.pdf

Religious obligation

Please contact your instructor with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details, visit the Equity Services website: carleton.ca/equity/wp-content/uploads/Student-Guide-to-Academic-Accommodation.pdf

Academic Accommodations for Students with Disabilities

If you have a documented disability requiring academic accommodations in this course, please contact the Paul Menton Centre for Students with Disabilities (PMC) at 613-520-6608 or pmc@carleton.ca for a formal evaluation or contact your PMC coordinator to send your instructor your Letter of Accommodation at the beginning of the
term. You must also contact the PMC no later than two weeks before the first in-class scheduled test or exam requiring accommodation (if applicable). After requesting accommodation from PMC, meet with your instructor as soon as possible to ensure accommodation arrangements are made. carleton.ca/pmc

Survivors of Sexual Violence

As a community, Carleton University is committed to maintaining a positive learning, working and living environment where sexual violence will not be tolerated, and is survivors are supported through academic accommodations as per Carleton’s Sexual Violence Policy. For more information about the services available at the university and to obtain information about sexual violence and/or support, visit: carleton.ca/sexual-violence-support

Accommodation for Student Activities

Carleton University recognizes the substantial benefits, both to the individual student and for the university, that result from a student participating in activities beyond the classroom experience. Reasonable accommodation must be provided to students who compete or perform at the national or international level. Please contact your instructor with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. https://carleton.ca/senate/wp-content/uploads/Accommodation-for-Student-Activities-1.pdf

For more information on academic accommodation, please contact the departmental administrator or visit: students.carleton.ca/course-outline

Student Academic Integrity Policy

Every student should be familiar with the Carleton University student academic integrity policy. A student found in violation of academic integrity standards may be awarded penalties which range from a reprimand to receiving a grade of F in the course or even being expelled from the program or University. Some examples of offences are: plagiarism and unauthorized co-operation or collaboration. Information on this policy may be found in the Undergraduate Calendar, Section 14, Page 59.

Plagiarism

As defined by Senate, "plagiarism is presenting, whether intentional or not, the ideas, expression of ideas or work of others as one's own". Such reported offences will be reviewed by the office of the Dean of Science.

Unauthorized Co-operation or Collaboration

Senate policy states that "to ensure fairness and equity in assessment of term work, students shall not co-operate or collaborate in the completion of an academic assignment, in whole or in part, when the instructor has indicated that the assignment is to be completed on an individual basis". Please refer to the course outline statement or the instructor concerning this issue.