	Carleton University *School of Computer Science* **COMP 2401** Intro. to Systems Programming **Course Outline (W2021)**	

Course Information:

- **Instructor:**   Mark Lanthier (**lanthier@scs.carleton.ca**)
- **Class:**   Tuesdays & Thursdays 1:05pm – 2:25pm, with pre-recorded lectures.
- **Office Hours:**   Tuesdays & Thursdays via **zoom** (ID posted on CULearn) from 1pm-4pm

Pandemic Adjustments:

- Lectures: All class lectures have been pre-recorded so that you can watch them at your own convenience. The lectures have been recorded via zoom and consist of me walking you through the course notes and working out the various coding examples so that you can see how the solutions are obtained. It is VERY similar to how I conduct my in-class lectures … so don't feel that you are missing out on anything due to the fact that they are pre-recorded. I will be on zoom during the class times. You can watch the lectures, pause them, connect through zoom to ask me questions, and then continue the lecture, or you can watch the lectures in advance and discuss the content with me during class time.

- Office Hours: I will be on zoom for the office hour times listed above. I will give priority to students asking lecture questions or questions on the course notes. If you cannot make my listed office hours you can email me with any meeting requests … but this should be to discuss course notes and lecture material only. For assignment questions, it is best to contact the Teaching assistants who will also have various office hours throughout the week (see course website for details).

Course Overview:

This course provides an introduction to systems-level programming. It covers fundamental OS concepts, procedures, primitive data types and user-defined types using the C programming language. The course will cover the following topics:

- Introduction to Systems Programming
- Working within a Linux environment
- Programming using the C language
- Data Representation (Bit representation, Primitive data types, Compound data types, Pointers)
- Memory Management (Stack and heap, Dynamic memory allocation)
- Arrays and Linked lists
- Concurrent Computing (Concurrent systems, Processes (signals, sockets) and Threads)
- Program Structure (I/O, Procedural program design and organization, Using libraries)
- File I/O, X11 windows and Graphics, Shell scripts

Course Objectives:

One main objective of this course is to teach you the C programming language. The code that you write may be lower-level code than you are used to.   Many students struggle with pointers and understanding what goes on behind the scenes when you create variables and call functions.   This course will give you a thorough understanding of how variables and stored and accessed and how the computer memory can be managed carefully and correctly.   These are concepts that you did not need to worry about in JAVA or Python as it was all handled for you. This course also has the objective of giving you some familiarity with using the Linux operating system. You will use a Virtual Machine and issue direct low-level commands with the underlying operating system.

- To take this course, a grade of **C-** or above MUST have been earned in **COMP1406**.
- You MUST **earn a C- or better in this course** to take some required 2nd/3rd year courses starting Fall 2021 !!

Course Notes:

There is no textbook assigned to this course. Instead, there is an in-depth set of course notes and coding examples available on the CULearn website. All materials created for this course (i.e., course notes, coding examples, lecture recordings, tutorials, tutorial code, assignments, assignment code bases, marking schemes, tests, exams, and test solutions) remain the intellectual property of the instructor. They are intended for the personal and non-transferable use of students registered in the course. Reproducing, reposting, and/or redistributing any course materials, in part or in whole, without the written consent of the instructor, is a **copyright violation** and is **strictly prohibited**.

Evaluation:

Component	Weight	Details	Due Date
Tutorials	**10%**	best 10 out of 11 at 1% each	Weekly, starting Jan 13th
Assignments	**45%**	best 5 of 6 at 9% each	Biweekly, usually due Wednesdays at 6pm
In-Class Tests	**30%**	best 2 of 3 at 15% each	Online (during class time) Feb 2, Mar 2, Mar 23
Final Exam	**15%**	no flexibility, do well	(to be announced)

Laboratory Software

You will be programming in the Linux environment using **VirtualBox**.   Go to this website and follow the instructions to get it all set up: https://carleton.ca/scs/technical-support/virtual-machines/

Once you install the VirtualBox, you need to install the Virtual Machine.   The Virtual Machine that we will use is named **COMP2401-F20.ova**.   You need to download that file and then when you run the VirtualBox, you can select **Add...** from the **Machine** menu to add the virtual machine. One added, you simply click on the virtual machine that you added (on the left side of the window) and then press the **Start** button. The username and password is always **student**.

In-class Tests

There will be 3 in-class tests that will be **scheduled during class times … starting sharply at 1:00pm (Eastern Standard Time)**. They will be **45 minutes in length** and will be done online through CULearn. You MUST be available and online during the class time, otherwise you will receive a grade of zero. There is no accommodation for Wi-Fi failure … so please ensure that you are in a location with a strong/consistent internet connection.   Some of you have data plans on your smartphone … you may be able to use your phone as a Wi-Fi Hot Spot in cases where your home internet signal gets lost.   If you miss one test, the other two will count for your grade. If you miss two tests ... one will end up with a zero grade. If you miss all three tests ... then you will likely need to withdraw from the course to avoid a grade of **F**.

Assignments

There will be assignments in this course which will be available on the course web page.

Lateness: Assignments must be handed in before or on the due date and time. For every **15 minute interval** that an assignment is late, there will be a deduction of **1%** off the grade. Hence, for example, an assignment that is late by **3** hours and **5** minutes will have a deduction of **13%**. After **25** hours ... the deduction is **100%** and the assignment will not even be graded. **Being "sick" on the day an assignment is due is not a valid excuse for not handing anything in.** You have 14 days to do each assignment. If you do not start your assignment the first week ... and then get too sick to work on it the last week ... you will end up with zero. So, start early and submit partially completed versions so that if you get sick, you will at least have part of it done and submitted. Keep in mind that being sick, does not give you permission to miss an assignment.

Submission: Assignments will be submitted on CULearn. DO NOT email your assignments to any TAs. If you are at home trying to submit and you cannot get it to work, you will be late with your assignment and will be subject to late submission deductions. So … make sure that your internet connection is reliable. If not, maybe a family member could let you connect to a **WiFi hotspot** through their phone so that you can connect and submit.

Backups: Keep a backup of your work, perhaps on a USB flash drive or by sending yourself an email with your assignment attached.

Marking Issues: It is your responsibility to ensure that your marks on CULearn are correct. Keep in mind that TAs can make mistakes. All complaints regarding assignment marks should be brought to the attention of **the TA who marked it**. Only if the TA does not address the problem to your satisfaction should you bring the matter to the instructor. This MUST be done **no later than two weeks after the assignment has been graded**. After this time, no remarking will be done.

Cheating and Plagiarism (University Policies)

Sadly, every term, students are caught cheating on assignments (and sometimes tests) in this course. Copying on an assignment or a test is considered plagiarism:

> **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".

Some examples of offences are: plagiarism and unauthorized co-operation or collaboration. Information on this policy may be found in the Undergraduate Calendar. To be as clear as possible:

- You are not allowed to **copy & edit any portion of another student's code, nor from any websites**, but you may use code from the course notes.
- You are not allowed to **give your code (or portions of it) to another student**.
- You are not allowed to **work on your assignment with other students**, nor with friends, parents, relatives, etc..
- You are not allowed to **post full or partial assignment solutions** on discussion boards or websites (e.g., github, facebook, etc..).

You must work on your assignment on your own without collaboration with other students. If you need help, please see a TA or your instructor. Your assignment **WILL BE COMPARED** with others in the course and if there is any hint that you have been involved in a plagiarism case, such reported offences will be sent to the office of the Dean of the Faculty of Science. Even if this is your **first time** getting caught cheating, the standard penality is to **receive an F** in the course. Things only get worse after that.

Penalties for such offences can be found on the ODS webpage: https://science.carleton.ca/academic-integrity/.

Tutorials

There will be mandatory tutorials in this course which will be counted towards your final grade. You will be assigned 1% of your final grade each time you **attend AND participate in** the tutorial for the full 1.5 hours. While in the tutorial, you must work on the tutorial work provided. You may not work on your assignment in that lab while the tutorial is going on. Near the end of the tutorial, the TA will make a note of who is working on the tutorial and who is not. If the TA finds that you did not spend your time doing the tutorial work, then you **will not get your grade**, even if you are there for the full 1.5 hours. Also, you are not allowed to get a hold of the tutorial beforehand to work on it or complete it before your tutorial session. If you show up to the tutorial with it partially or completely done, you will not get your grade. So, to put it simply, come to the tutorial each week, do the work while you are there and then leave. You should plan to stay the full 1.5 hours each week. You MUST attend the tutorial that you are registered in. Tutorials take place online this term.

Undergraduate Academic Advisor

The Undergraduate Advisor for the School of Computer Science is available by email at undergraduate_advisor@scs.carleton.ca. The undergraduate advisor can assist with information about prerequisites and preclusions, course substitutions/equivalencies, understanding your academic audit and the remaining requirements for graduation. The undergraduate advisor will also refer students to appropriate resources such as the Science Student Success Centre, Learning Support Services and the Writing Tutorial Services.

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:

Religious & 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: http://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.

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: http://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.

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