

Western University
Faculty of Science
Department of Computer Science
Computer Science 2211a

Welcome to the class!

Course Information:

Computer Science 2211a
Software Tools and System Programming
Course Outline – **Summer Term 2021**

Calendar Description:

This course provides an introduction to software tools and systems level programming. Topics include: understanding how programs run (compilation, linking, and loading), an introduction to a complex operating system (UNIX), scripting languages, and the C programming language. As time permits, other topics will be chosen from: system calls, memory management, libraries, multi-component program organization and builds, version control, debuggers and profilers.

Prerequisites

[Either] Computer Science 1027a/b, 1037a/b, or 2101a/b with a grade of at least 65%; [-Or-]
Integrated Science 1001X with a grade of at least 60%.

Unless you have either the requisites for this course or written special permission from your Dean to enroll in it, you may be removed from this course and it will be deleted from your record. This decision may not be appealed. You will receive no adjustment to your fees in the event that you are dropped from a course for failing to have the necessary prerequisites. For questions about this, contact Science Academic Support and not the instructor.

Antirequisites

Software Engineering 2250a/b and the former Software Engineering 201a/b

Instructor: L. Russell
Office: Online
Office Hours: MS Teams/Zoom : Typically Wednesdays at 6pm (email 48h before for a meeting link)
E-Mail: luke.russell<at>uwo.ca

Required Material:

Required Textbooks:

- S. Das, Your UNIX/Linux: The Ultimate Guide. McGraw-Hill: 3rd edition, 2013.
- K.N. King, C Programming: A Modern Approach. Norton: 2nd edition, 2008.

These books are available from the campus bookstore, or many online sources.

The instructor has requested that portions of the book be scanned and placed on reserve at the Western Library (for free!).

Technical Requirements:

- Internet connection reliable for synchronous components of the course.
- Ability to connect to lab resources and to run required software

Course Topics

The course will strive to address as many of the following topics as time allows:

- **UNIX Fundamentals:** UNIX vs. Windows; logging on; files and directories; path names, and directory and file structure; editors; shells; I/O redirection; UNIX concurrency (processes); utilities; file permissions and security; regular expressions; shell programming.
- **C programming:** compiling, linking and loading; data types and operators; control structures; formatted I/O; file I/O; connections between I/O and the underlying operating system; function calls; structs; enumerations; arrays; pointers (pointer arithmetic, pointers and arrays, arrays of pointers, pointers to functions); memory management; linked lists and other dynamically allocated data structures; strings; calling C from UNIX; general libraries; standard libraries and headers; the C preprocessor; C program organization.
- **UNIX Tools:** building and managing multi-component programs; the make utility; version control and configuration management; debuggers; code performance and profiling.

Course Web Page:

The course website is located within OWL (powered by Sakai). To access the website, navigate to <http://owl.uwo.ca> and login with your university personal computer account (user id and password). Lecture notes, assignments and class information will be posted at this site. You are responsible for checking the course site regularly.

The course will also use Microsoft Teams for some components of the course. Please be sure to [install MS Teams](#) on your computer (do not rely on the web version).

Course Schedule:

The scheduled lab times will be run in most weeks as a synchronous lecture. Please plan to attend one or the other.

Section 002 Tuesdays 7-9pm
Section 003 Thursdays 7-9pm

Lab Schedule:

- There will be 6-12 labs, and they will carry an equal weight.
- Lab details are scheduled each week as posted on OWL, and are completed on your own
- In this summer session, the number of labs per week may vary.
- Lab descriptions will be posted on the course website.
- All labs are to be submitted only through OWL (similar to the assignment submission process).

Course Information

Scheduled Lectures - blended format and Attendance:

The course will primarily be run in an “online blended” style with an expectation of 5-6 live sessions. The remaining material will be provided in an asynchronous format (readings, videos, labs, etc.)

To fully gain the knowledge of the course, it is expected that you attend each class on time. Please plan to attend the live sessions as scheduled.

If you must miss a class due to illness or a justifiable activity, please let the instructor know in advance so that arrangements can be made.

Note that selected classes and remaining material may be run **asynchronously** with suggested readings and/or activities posted instead of a live class. Please check Owl / MS Teams regularly for updates.

Emergencies and Extenuating Circumstances

COVID-19 has created many challenges for everyone. If you have an emergency or extenuating circumstance and are unable to complete a requirement, please discuss the situation with the instructor.

Helping peers on MS Teams:

Computer scientists often work in teams throughout our careers, and this work is more and more asynchronous in nature. To facilitate this, please ask technical questions in the MS Teams “Technical help-Questions” channel on MS Teams.

Please help your peers by replying to this channel and helping your peers. Actively helping peers is accounted in the miscellaneous assorted exercises category of your grade, and may also be used to “round up” your final grade.

Class Conduct

- It is expected that students behave in a professional manner, and unacceptable or unsafe conduct will not be tolerated. Out of respect for all course participants, please refrain from recording videos or audio, using SnapChat, Instagram Stories, E-mail, WhatsApp etc, or in any other medium. Even if it is to share every exciting moment of the class :)

Course Recordings:

- Portions of this class may be recorded by the instructor for educational purposes. These recordings may be shared with students enrolled in the course, if applicable. Students are not to initiate course recordings without prior permission.

Unauthorized Recordings/Distribution:

- Unauthorized student recording of classroom or other academic activities (including advising sessions or office hours) is prohibited. Unauthorized recording is unethical and may also be a violation of University policy. Students requesting the use of assistive technology as an accommodation should contact the Accessibility Centre. Unauthorized use of classroom recordings – including distributing or posting them – is also prohibited.
- Under the University’s Copyright Policy, instructors own the copyright to instructional materials – including those resources created specifically for the purposes of instruction, such as lectures slides, lecture notes, and presentations.
- Students cannot copy, reproduce, display, or distribute these materials or otherwise circulate these materials without the instructor’s written permission.
- Students who engage in unauthorized recording, unauthorized use of a recording, or unauthorized distribution of instructional materials will be reported to the appropriate University office.

Help/TAs:

Questions regarding assignments or lecture materials can be directed to a peer, or Teaching Assistant (TA) through the “Technical Help-Questions”. Questions requiring further information can be dealt with by contacting the course instructor. Peers may help you faster than the TA or instructor can get to it!

A list of teaching assistants and their contact information will be posted to OWL once available.

Time zone and Scheduling of Course Components:

All times listed in this document, Microsoft Teams, and on the OWL course site are assumed to be in Eastern Time (the local time of the Western University

campus) unless otherwise stated. Lectures, quizzes, meetings, and exams will be scheduled for the Eastern Time Zone.

Students must ensure they are available during these times even if they are located outside of Ontario. No alternative deadlines, quiz dates/times, or exam dates/times will be offered for students outside of the Eastern Time Zone.

Evaluation:

This course is a compressed summer course, so deadlines may seem a bit tight. Description provided for interest. Final version will be posted to course Owl page.

Element	Weight
<p>Assignments: There will be 3-5 assignments, and you will typically have 5 calendar days to complete them.</p>	20%
<p>Miscellaneous exercises: These assorted activities throughout this semester will be for a total of 30%, and will include in this category one quiz, small activities assigned, and your contribution to helping classmates on the MS Teams “technical help” channel</p>	30%
<p>Labs: There will likely be 1-2 labs assigned per week, for a total as few as 6 and as many as 12 labs. You will typically get at least 3 calendar days to complete them.</p>	15%
<p>Final Exam: This is as scheduled by the University.</p>	35%

If for any reason the assignment, lab, or exercise schedule or frequency cannot be adhered to, the marks will be prorated.

Assignments:

Students are expected to attend the synchronous components of the class and complete all asynchronous materials and complete the online exercises to prepare for the assignments. Once the assignment is completed, all parts of the assignment must be submitted on the OWL site. It is the student’s responsibility to ensure that all parts of each assignment are correctly uploaded and submitted in OWL, to ensure that the assignment can be marked accordingly.

Assignments emailed to the instructor or teaching assistant will not be accepted, unless there are extenuating circumstances and prior approval from the instructor.

Assignment Posting and Deadlines:

3-5 assignments will be posted throughout the term, and you will typically get 5 calendar days to complete them.

You may need to read ahead in the textbook/resources and review all posted material to complete the assignments.

Assignment Marking:

Assignments will typically be marked by a TA within 2 weeks of the assignment due date where possible.

Individual marks will be posted on the OWL site once marks are returned.

Questions regarding the marking of assignments should first be directed to the teaching assistant that graded your assignment and then the course instructor if your discussion with the teaching assistant was not satisfactory, with a detailed explanation of what was awarded and why you believe this is in error.

Requests for mark adjustments will only be considered if they are made within 1 week of receiving the assignment mark, and have been first discussed with the teaching assistant who marked the assignment. Assignment marks will be final after that date.

Requests for mark adjustments will only be considered when they are for adjustments of 5% or more

Late Policy for Assignments:

0-1h: -10%, 1h-24h: -20%, 24-48h: -40%, after 48h: 0%

Self-Reported extensions for assignments:

- This allots a 48 hour grace period based on the original assignment due date. No late penalty extension as described above is provided nor will be applied for Self-Reported extensions.
- Submissions for Self-Reported extension will not be accepted after 48 hours past the original due date.
- Please email the TA and CC the instructor to confirm your submission of a self-reported extension. Details are: [Academic Consideration for Absences - Academic Consideration for Absences - Western University \(uwo.ca\)](#)

Online Quizzes:

One quiz is expected to be given online (likely via the OWL platform).

For a major quiz, the date will be announced 5 calendar days before the quiz.

Quizzes must be started at the given date and time. Failing to complete the quiz during the given times will result in a 0 grade being entered for the quiz.

Quizzes are open book but must be done individually and without the assistance of others. Sharing quiz questions/solutions, completing a quiz for or with another person or otherwise cheating on a quiz will result in a 0% quiz grade for ALL quizzes.

If the quiz is not given or the quiz must be cancelled for any reason, the weight of the cancelled quiz will be placed on the final exam.

The makeup quiz will be scheduled likely one week after the original quiz.

A student must have an approved absence to be eligible to take the makeup quiz. If for any reason the student cannot complete the original quiz and then cannot complete the makeup quiz, then the weight of a quiz missed due to documented and approved medical or compassionate grounds will be placed on the final exam.

Final Exam:

The final exam will be conducted online and cover all course material including assigned readings, tutorials, lecture slides, and materials covered in assignments and lab homework. The final exam will be scheduled during Finals Period at Western.

The final examination in this course may be conducted using the remote proctoring service, such as Proctortrack. By taking this course, you are consenting to the use of this software and acknowledge that you will be required to provide personal information (including some biometric data) and the session will be recorded. More information about this remote proctoring service is available in the Online Proctoring Guidelines at the following link:

<https://www.uwo.ca/univsec/pdf/onlineproctorguidelines.pdf>

Completion of this course will require you to have a reliable internet connection and a device that meets the technical requirements for this service. Information about the technical requirements are available at the following link:

<https://www.proctortrack.com/tech-requirements/>

The final exam is to be completed individually, with no assistance or contact with others. Violation of this rule, any other exam rule, or cheating of any kind will result in a 0% grade for the final exam and the possibility of additional penalties as deemed appropriate by the course instructor, department or university including but not limited to a failing grade being entered for the course.

Email Contact:

Occasionally email messages may be sent to the entire class or to students individually. Email will be sent to your UWO email address as assigned to you by Information Technology Services (ITS). It is your responsibility to read this email on a frequent and regular basis.

You should note that email at the university and through other providers have quotas or limits on the amount of space that is dedicated to each account. Unchecked email may accumulate beyond those limits and you may be unable to retrieve important messages from the university. Losing email is not an acceptable excuse for not knowing about the information that was sent.

If you have any technical/lab/assignment questions, please post (and answer) them on the class MS Teams “Technical Help-Questions” channel.

Personal questions that are specific to you (e.g. accommodations, extension requests, etc.) or your assignment’s content should be sent to the course instructor assigned to your section

Please first check the MS Teams to see if the information has already been posted before creating a new post. Please use proper, appropriate and respectful English when sending an email message or posting on the course web site.

University Email

University policy states that Instructors must not respond to e-mail messages from students unless the e-mail originates the student’s University email account.

Do NOT use ‘Respond To’ from any email or announcement message from OWL. You MUST type in the instructor’s email in the destination. Please check the destination before sending an email to ensure it is addressed to the instructor and NOT to: postmaster@owl.uwo.ca [this is very important – please make sure you understand and follow the standards above.]

Meaningful Subject line

Please also include a meaningful subject line or topic description of the contents of the email, including the course code CS 2211 in the subject line and send e-mails from your @uwo.ca e-mail account.

The instructor will be unable to respond to questions about your personal grades, assignment, etc. if they are not sent via a known @uwo.ca e-mail account for security and privacy reasons.

Online Conduct:

All of the remote learning sessions for this course may be recorded. The data captured during these recordings may include your image, voice recordings, chat logs and personal identifiers (name displayed on the screen). The recordings will be used for educational purposes related to this course, including evaluations. The recordings may be disclosed to other individuals participating in the course for their private or group study purposes. Please contact the instructor if you have any concerns related to session recordings.

All Zoom/Teams contact will require that your video is turned on and that you can be seen by the instructor. Not only is this a simple courtesy and the standard of Zoom/Teams classes, but it allows for a positive interaction. Any student who is in attendance of a Zoom/Teams contact and does not have their video active may be removed from the session. Do not be concerned on how you may look. [You are welcome to enable a virtual background!!!!](#)

All Zoom/Teams contact will require that your audio is turned OFF and that you

cannot be heard by the instructor (unless you are interacting directly during the Zoom/Teams contact). Not only is this a simple courtesy and the standard of Zoom/Teams classes, but it allows for a positive interaction. Any student who is in attendance of a Zoom/Teams contact and does not have their audio active will be first muted by the professor and if this persists may be removed from the session.

Computing Facilities

- Each student will be given an account on the Computer Science Department senior undergraduate computing facility, GAUL. GAUL accounts are automatically created, normally within 24 hours, after enrolment and the username/password would be the same as your UWO email account.
- If a student is able to log into his/her UWO email, but is unable to log into the Gual systems after 3 days of enrolment, please submit a ticket with Science Technology Services at <https://helpdesk.sci.uwo.ca>.
- In accepting the GAUL account, a student agrees to abide by the computer science department's *Rules of Ethical Conduct*.

Accommodation and Accessibility

Accommodation Policies

Students with disabilities work with Accessible Education (formerly SSD) which provides recommendations for accommodation based on medical documentation or psychological and cognitive testing. The Academic Accommodation for Students with Disabilities policy can be found at: [https://www.uwo.ca/univsec/pdf/academic_policies/appeals/Academic Accommodation disabilities.pdf](https://www.uwo.ca/univsec/pdf/academic_policies/appeals/Academic_Accommodation_disabilities.pdf)

Academic Consideration for Student Absence – Self Reporting

Students will have up to two (2) opportunities during the regular academic year to use an on-line portal to self-report an absence during the semester, provided the following conditions are met: the absence is no more than 48 hours in duration, and the assessment for which consideration is being sought is worth 30% or less of the student's final grade.

Students are expected to contact their instructors within 24 hours of the date of the event of the self-reported absence, unless noted on the syllabus.

Students are not able to use the self-reporting option in the following circumstances:

- for exams scheduled by the Office of the Registrar (e.g., December and April exams)
- absence of a duration greater than 48 hours,
- assessments worth more than 30% of the student's final grade,
- if a student has already used the self-reporting portal twice during the academic year

Self-reporting for any of the quizzes must be approved by the course instructor. All self-reporting for quizzes must be emailed to the instructor with the subject of **CS2211 S21 – Self Reporting**. **Self-reporting** for any of the assignments must be included with the student assignment submissions using the assignment submission form. See OWL for full details on Assignment Submissions and Assignment Submission Forms.

If the conditions for a Self-Reported Absence are *not* met, students will need to provide a Student Medical Certificate if the absence is medical. Otherwise the student must provide appropriate documentation if there are compassionate grounds for the absence in question.

Students are encouraged to contact their Faculty academic counselling office to obtain more information about the relevant documentation.

Students should also note that individual instructors are not permitted to receive documentation directly from a student, whether in support of an application for consideration on medical grounds, or for other reasons. **All documentation required for absences that are not covered by the Self-Reported Absence Policy must be submitted to the Academic Counselling office of a student's Home Faculty.**

For policy on Academic Consideration for Student Absences - Undergraduate Students in First Entry Programs, see: https://www.uwo.ca/univsec/pdf/academic_policies/appeals/Academic_Consideration_for_absences.pdf and for the Student Medical Certificate (SMC), see: http://www.uwo.ca/univsec/pdf/academic_policies/appeals/medicalform.pdf

Religious Accommodation

Students should consult the University's list of recognized religious holidays, and should give reasonable notice in writing, prior to the holiday, to the Instructor and an Academic Counsellor if their course requirements will be affected by a religious observance. Additional information is given in the Western Multicultural Calendar: <https://multiculturalcalendar.com/ecal/index.php?s=c-univwo>

You may also be eligible to write the Special Exam if you are in a "Multiple Exam Situation" (see http://www.registrar.uwo.ca/examinations/exam_schedule.html).

Special Examinations

If a student fails to write a scheduled Special Examination, the date of the next Special Examination (if granted) normally will be the scheduled date for the final exam the next time this course is offered. The maximum course load for that term will be reduced by the credit of the course(s) for which the final examination has been deferred. See Academic Calendar for details (under [Special Examinations](#)).

Support Services:

Please visit the Science & Basic Medical Sciences Academic Counselling webpage for information on add/drop courses, academic considerations for absences, appeals, exam conflicts, and many other academic related matters: <https://www.uwo.ca/sci/counselling/>

Please contact the course instructor if you require lecture or printed material in an alternate format or if any other arrangements can make this course more accessible to you. You may also wish to contact Student Accessibility Services (SAS) at (519) 661-2147 if you have any questions regarding accommodations.

Western University is committed to a thriving campus as we deliver our courses in the mixed model of both virtual and face-to-face formats. We encourage you to check out the Digital Student Experience website to manage your academics and well-being: <https://www.uwo.ca/se/digital/>.

Learning-skills counsellors at the Student Development Centre (<http://www.sdc.uwo.ca>) are ready to help you improve your learning skills. They offer presentations on strategies for improving time management, multiple-choice exam preparation/writing, textbook reading, and more. Individual support is offered throughout the Fall/Winter terms in the drop-in Learning Help Centre, and year-round through individual counselling.

Students who are in emotional/mental distress should refer to Mental Health@Western (http://www.health.uwo.ca/mental_health) for a complete list of options about how to obtain help.

Additional student-run support services are offered by the USC, <http://westernusc.ca/services>.

Ethical Conduct:

Scholastic offences are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at the following Web site: http://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_undergrad.pdf.

Plagiarism

All required assignments, quizzes and exams may be subject to submission for textual and metadata similarity review to plagiarism detection software. All assignments, quizzes and exams submitted for such checking may be included as source documents in the reference database for the purpose of detecting plagiarism of papers subsequently submitted to the system. Use of such services are subject to the licensing agreement with The University of Western Ontario. These services and software may include but are not limited to Turnitin (<http://www.turnitin.com>), MOSS, SCANEX, and custom plagiarism detection software developed for the course.

Computer-marked multiple-choice quizzes and exams may be subject to remote proctoring software (Proctortrack) and submission for similarity review by software that will check for unusual coincidences in answer patterns that may indicate cheating. For details on Proctortrack and remote proctoring see the final exam section.

Students must write their assignments in their own words. Whenever students take an idea, or a passage from another author, they must acknowledge their debt both by using quotation marks where appropriate and by proper referencing such as footnotes or citations. Plagiarism is a major academic offence (see Scholastic Offence Policy in the Western Academic Calendar).

All assignments are individual assignments. You may discuss approaches to problems among yourselves; however, the actual details of the work (assignment coding, answers to concept questions, etc.) must be an individual effort. All assignments will be subject to both content and metadata plagiarism analysis.

All quizzes and the final exam are to be written individually, the content and questions not shared and provided rules followed.

Tutors and Outside ‘Help’ on assignments

Students may receive the help of a tutor on assignments, so long as the tutor only identifies errors or demonstrates sample problems that are **not** part of the assignment. If the content of your assignment is significantly different than if you had not received help, then this is an indication you may have crossed the line into cheating. Again, if you are unsure about how much help is too much, ask your instructor.

The role of tutoring is to help students understand course material. Tutors should not write any part or all of an assignment for the students who hire them. Tutors should not ‘advise’ or ‘suggest’ what is to be entered into an assignment or the solutions to any portion of the assignments. Any aid beyond what you would have received directly from the instructor will be

considered an academic offense. Having employed the same tutor as another student is not a legitimate defense against an accusation of collusion, should two students hand in assignments judged similar beyond the possibility of coincidence.

Academic dishonesty in assignments includes (but is not limited to):

- Unacceptable collaboration
- What is unacceptable? There is a difference between discussing assignments and solutions with fellow students and working together on the solutions to the point where the work submitted is clearly not individual work. **If in doubt, ask your instructor.**
- **Copying** of another student's assignment
- **Allowing** another student to copy your work (*this is also an **Academic Offense***)
- Sharing your assignment with another student electronically or otherwise *this is an **Academic Offense for both students.***
- Using another student's assignment or work as a "template" or "starting point" or your own work. *This an **Academic Offense for both students***
- Using sites dedicated to sharing assignment solutions or aiding cheating, including but not limited to Course Hero, OneClass, and Chegg.
- Using code from an external source (text, instructor, course website) where a student's own code is expected (**if in doubt, ask your instructor**)

Academic dishonesty in quizzes and exams includes (but is not limited to):

- Writing a quiz/exam with the aid of another person (*this an **Academic Offense for both students.***)
- Sharing quiz/exam questions/answers or using ones sent to/obtained by you.
- Having another person write a quiz/exam for you.
- Failing to follow the specific rules given in the quiz/exam.
- Sharing you screen or virtually taking a quiz/exam with others (e.g. being in an online chat of anykind while taking a quiz/exam).

The penalty for academic dishonesty in any course component is receiving 0% for that component **AND** the possibility of additional penalties as deemed appropriate by the course instructor, department or university including but not limited to an additional penalty equal to the course component, or a failing overall grade being entered for the course. Note that receiving 0% on an assignment may make you ineligible for a passing grade due to the 49% requirement given in the Student Evaluation section. Receiving 0% on the final exam, will make you ineligible for a passing grade in this course.

You are responsible for reading and respecting the Computer Science Department's policy on: Scholastic Offences:

https://www.csd.uwo.ca/undergraduate/current/policies/scholastic_offenses.html

and Rules of Ethical Conduct: https://www.csd.uwo.ca/undergraduate/current/policies/ethi_cal_conduct.html

Welcome to the class!