

## COMPSCI 2211B Course Outline

### Winter 2026

#### 1. Course Information

##### **Course Description – COMPSCI 2211B: Software Tools and Systems Programming**

An introduction to software tools and systems programming. Topics include

- understanding how programs execute (compilation, linking, and loading);
- an introduction to a complex operating system (UNIX);
- scripting languages;
- the C programming language;
- system calls;
- memory management;
- libraries;
- multi-component program organization and builds;
- version control;
- debuggers and profilers.

##### **List of Prerequisites**

Computer Science 1027A/B, Computer Science 1037A/B, or the former Computer Science 2101A/B, in each case with a mark of at least 65%.

Unless you have either the prerequisites for this course or written special permission from the Department of Computer Science to enroll in it, you may be removed and withdrawn from this course in accordance with university policy. This may be done after the add/drop deadline of the academic term, and the course will be marked as withdrawn (WDN) on your academic record. This decision may not be appealed.

#### 2. Instructor and Contact Information

Instructors	Email	Office	Office Hours
Duff Jones	<a href="mailto:djone5@uwo.ca">djone5@uwo.ca</a>		Tuesday: 11:30 AM to 12:30 PM
TA	TBD	TBD	TBD

## Email Policy

Students must use their Western (@uwo.ca) email addresses when contacting their instructors.

Occasionally, email messages may be sent to the entire class or to individual students. Email will be sent to your UWO email address as assigned to you by Western Technology Services (WTS). **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.

Email contact with the course instructors is encouraged, and we endeavour to reply to messages within 24 hours between Monday and Friday and within 48 hours on Saturday, Sunday, and holidays.

Students can ask questions via email; however, if there are any large, somewhat complicated issues, it is recommended to discuss them during office hours. You **must** use your UWO account for security and privacy reasons.

**NOTE:** In the subject line, please include **[2211]** and include a title or topic description of the contents of the email 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.

For example, please ensure e-mail looks like this:

From: Student Name <[sname123@uwo.ca](mailto:sname123@uwo.ca)>  
Subject: [2211] Assignment 3 part 1: Question about strings

and NOT like this:

From: Crazy ALIAS name <[super+crazy\\_email@weirddomain.tv](mailto:super+crazy_email@weirddomain.tv)>  
Subject: RE: RE: FWD: re: Subject FW: Bunch O' Questions

## Office Hours

Office hour locations and times are listed in the table above. Office hours can be used to ask assignment questions, but we encourage students to drop by to ask questions related to course materials as well. There often is not enough time during lecture to answer more complex questions; office hours are the best time for that.

### 3. Course Syllabus, Schedule, Delivery Mode

#### Course Topics

This course will address as many of the following topics as time will allow:

- **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.

#### Learning Outcomes

Upon completion of this course, a student will have

- **An understanding of program execution and UNIX fundamentals:** Students will be able to explain how programs run by understanding compilation, linking, and loading processes, and demonstrate proficiency in using UNIX operating system tools.
- **Proficiency in C programming:** Students will develop the ability to write, compile, and debug C programs, utilizing data types, control structures, pointers, etc.
- **An understanding of how to use libraries in C Programming:** Students will demonstrate the ability to incorporate and use general and standard libraries in C programming.
- **The ability to develop and debug multi-component software:** Students will be able to build, manage, and debug multi-component software applications using UNIX tools and the C programming language.

#### Course Schedule and Delivery

Lecture Section	Instructor	Day and Time	Location
001	Duff Jones	Tuesday: 9:30 AM – 10:30 AM Friday: 9:30 AM – 11:30 AM	

All classes are delivered in person at the times listed above.

**Please check your schedule to determine which lab section you are registered in.** There is not enough room for you to attend a lab that you are not scheduled to attend, so only attend the lab you have been scheduled to attend.

## 4. Course Materials

### Recommended Textbooks

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

Both textbooks, and their costs, can be found at the UWO Bookstore using [this link](#).

### Course Web Page

All course material will be posted to OWL: <https://westernu.brightspace.com/>.

You are responsible for checking the course OWL site regularly for news and updates. This is the primary method by which information will be disseminated to all students in the class.

If you need assistance with the course OWL site, you can seek support on the [OWL Brightspace Help](#) page. Alternatively, you can contact the Western Technology Services Helpdesk. They can be contacted by phone at 519-661-3800 or ext. 83800.

### Technical Requirements

To participate in this course, you will need access to a stable Internet connection for accessing the Computer Science Department's senior undergraduate computing facility, GAUL.

GAUL accounts are automatically created, normally within 24 hours, after enrollment and the username/password is the same as your UWO email account. If you can log into your UWO email but are unable to log into the GAUL systems after three days of enrollment, please submit a ticket with Science Technology Services at <https://helpdesk.sci.uwo.ca>. In accepting the GAUL account, you agree to abide by the Computer Science Department's *Rules of Ethical Conduct*.

Access to GAUL is **REQUIRED** to complete this course. You are welcome to work on assignments and labs on your own Unix/Linux environment if you wish, but everything you submit must work on GAUL.

## 5. Methods of Evaluation

### Grading Scheme and Assessment Dates

The overall course grade will be calculated as listed below:

Assignments (5)	30%
Labs (10 of 12)	10%
Midterm Test	20%
Final Exam	40%

## Essential Learning Requirements

To be eligible to obtain a final grade of 60% or higher in this course, you must achieve

- at least a 50% weighted average<sup>1</sup> on the midterm and final exam; and
- at least a 50% weighted average<sup>1</sup> on the five assignments.

To be eligible to obtain a final grade of 50% or higher in this course, you must achieve

- at least a 40% weighted average<sup>1</sup> on the midterm and final exam; and
- at least a 40% weighted average<sup>1</sup> on the five assignments.

There will be no exceptions or waiving of these requirements for any reason or circumstance.

## Lectures

This course is delivered synchronously. Slides will be provided prior to the lectures, but slides will not contain all course material. You are expected to attend lectures and take your own notes. If absent (e.g., due to illness), you are expected to get notes from a classmate. Office hours provide an opportunity to ask questions related to missed material, but students should not expect the lecture to be re-delivered during office hours.

## Labs

There will be 12 equally weighted labs (one per week) worth 10% of the final grade.

- Labs begin in the **second week** of classes (i.e., the week of January 12).
- Lab descriptions will be posted on the course website each week.
- To be eligible for full marks, you must participate and complete **at least 10 out of 12 labs**; however, participating and completing all 12 labs is recommended.
- The labs don't need to be submitted and reviewed because they are not an assessment of your ability to apply the subject matter. That's what the assignments are for. Labs act as practice/tutorial sessions where you can solve problems and interact with the TA and other students. Collaboration and assisting others are both encouraged.
- Labs are the "attendance" portion of your grade. You must check in with the TA. The TA will mark your lab participation as complete or incomplete in OWL.

## Assignments

There are five assignments. Each is worth 6% of the final grade for a total of 30%.

You are expected to view the lecture materials and complete the online exercises to prepare for the assignments. Once the assignment is completed, all parts of the assignment must be submitted via OWL. It is your responsibility to ensure that all parts of each assignment are correctly uploaded and submitted via OWL to ensure that the assignment can be marked accordingly.

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

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<sup>1</sup> This weighted average is calculated by multiplying each assessment score by its assigned weight (the percentage it contributes to the final grade), then adding these values together. This total is divided by the sum of the weights to determine the overall average as a percentage.

### **Assignment Schedule (Tentative)**

<b>Assignment</b>	<b>Weight</b>	<b>Due Date (by 11:55 PM)</b>
1	6%	Tuesday, January 27, 2026.
2	6%	Tuesday, February 10, 2026.
3	6%	Tuesday, March 3, 2026.
4	6%	Tuesday, March 17, 2026.
5	6%	Tuesday, April 7, 2026.

The due dates of the assignments are shown in the table above. Please note that all these dates are tentative. **The due dates will be confirmed when the assignments are posted on OWL.** The dates will coincide with the class progression on relevant assignment topics.

If for any reason the assignment schedule given above cannot be adhered to, then the assignment marks will be reweighted. The five (5) assignments are worth 30% of the overall mark for the course. If an assignment must be cancelled for any reason, the remaining assignments will be reweighted to add up to 30%.

### **Assignment Marking**

- Assignments will be marked by a TA within two weeks of the assignment due date where possible.
- Individual marks and a detailed mark breakdown will be posted on the OWL site once marks are returned.
- Questions regarding the marking of assignments should first be **directed to the TA who graded your assignment**. This should be done via email, clearly identifying what rubric element was graded incorrectly and why. If the discussion with the TA was not satisfactory, then you should forward the conversation with the TA to the instructor assigned to your section along with an explanation of why you believe further marks are warranted.
- Requests for mark adjustments will only be considered if they are made **within one week** of receiving the assignment mark and have been first discussed with the TA who marked the assignment. Assignment marks will be final after that date.

### **Late Policy for Assignments**

It is expected that students budget enough time to properly submit their assignments via OWL and allow for any unforeseen technological issues. 11:55 PM is a hard deadline, and no extensions or relief will be given for assignments that just miss this deadline or miss the deadline due to technical issues. Students are expected to regularly back up their assignments and submit well before any deadline.

- Assignments will be accepted only up to two (2) days late.
- Assignments submitted after 11:55 PM on the due date but before 11:55 PM on the day after the posted due date will be deducted 10% of the total grade.
- Assignments submitted after 11:55 PM on the day after the due date but before 11:55 PM on the second day after the posted due date will have 25% of the total grade deducted.
- Assignments cannot be submitted after 11:55 PM on the second day after the posted assignment due date (i.e., the maximum time an assignment can be late is 48 hours after the due date). Any assignments submitted after this point in time will receive a grade of zero (0).
- Late assignments will have a 10% or 25% deduction from the maximum mark for the assignment based on time of submission as listed in OWL. Thus, if you would have received 90% on an assignment based on 100%, then if it was submitted five hours late you would receive 80%. If the assignment is submitted 25 hours late, then you would receive 65%.

## **Exceptions to the Deadline and Late Policy**

Life happens, and sometimes it is not possible to submit an assignment on time. If events cause you to require flexibility, then you can take advantage of one of the following options:

- **Academic advising**
  - Academic accommodation may be provided by [Science Academic Advising](#) (or academic advising appropriate for your program). If there are circumstances beyond your control that preclude you from submitting on time, you should connect with an academic counsellor who can recommend an extension on your behalf. Documentation will likely be required by the academic counsellor. **Documentation should not be sent to the instructor.**
  - Once you have talked with your academic counsellor, you should connect with the instructor to decide an appropriate deadline given your circumstances. If it is not possible to determine an appropriate deadline, the weight of the assignment will be placed on the final exam.
  - This can be applied *proactively* or *retroactively* but only if recommended by the academic counsellor.
- **One late penalty automatically reversed**
  - Each assignment is worth 6% of the overall grade. A -25% late penalty on 6% is -1.5% of the overall course grade. Therefore, you will automatically receive the equivalent of +1.5% to your overall grade. In other words, **all students will receive +1.5% on their overall grade for free.**
  - In practice, this means

	Deduction from overall grade	One late penalty automatically reversed	Effective change to overall grade
<b>All assignments on time</b>	0.0%	+1.5%	+1.5%
<b>One assignment submitted two days late</b>	-1.5%	+1.5%	0.0%
<b>One assignment submitted one day late</b>	-0.6%	+1.5%	+0.9%
<b>Two assignments two days late</b>	-3.0%	+1.5%	-1.5%
...	...	...	...

- **Important notes:**
  - The late penalty will still be applied to the assignment. The +1.5% is added to the final course grade, not the assignment.
  - The final course grade is still capped at 100%.
  - This is applied *automatically*; input from the student is not required.

## Examinations

There will be both a midterm and a final exam. The following is the tentative exam schedule (subject to change):

Exam	Weight	Date
Midterm	20%	Thursday, February 26, 2026. 9:30 AM to 11:00 AM (During lecture time in class)
Final Exam	40%	Scheduled by the Registrar's Office during the Final Exam Period

### ***Permissible Materials During Examinations***

Both the midterm and the final exam are closed book; however, you will be allowed to bring in **one 8.5 x 11 sheet of handwritten notes**. You may write on both sides of the page. Photocopies are not permitted. Handwritten notes written on a tablet and then printed off are also not permitted. You should contact your instructor regarding any accommodations to this policy for accessibility purposes.

No electronic devices of any kind are allowed.

All exams are 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 zero (0) for the examination and the possibility of additional penalties as deemed appropriate by the course instructor, department, or university. These penalties may include, but are not limited to, a failing grade being entered for the course

### ***Midterm***

The midterm will be conducted in person and cover all course material including assigned readings, tutorials, lecture slides, and materials covered in assignments and lab homework **up to the end of the week prior to the midterm (i.e., Friday, February 13 [due to Reading Week])**. The actual length of the midterm is 1.5 hours.

More information on the midterm's composition will be provided closer to the date it will be written.

**There is no makeup midterm.** If you have an approved absence from an academic advisor, the weight of the missed midterm will be placed on the final exam. If you do not have an approved absence, the midterm grade will be zero (0).

### ***Final Exam***

The final exam will be conducted in person 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 by the Registrar's Office during the Final Exam Period. You should not book any travel prior to the Registrar's Office releasing the final schedule.

When a student misses the final exam and their Academic Consideration has been granted, they will be allowed to write the Special Examination (the name given by the University to a makeup final exam). See the Academic Calendar for details (under [Special Examinations](#)), especially for those who miss multiple final exams within one examination period.

## General Information About Missed Coursework

Students must familiarize themselves with the *University Policy on Academic Consideration – Undergraduate Students in First Entry Programs*, posted on the Academic Calendar: [https://www.uwo.ca/univsec/pdf/academic\\_policies/appeals/academic\\_consideration\\_Sep24.pdf](https://www.uwo.ca/univsec/pdf/academic_policies/appeals/academic_consideration_Sep24.pdf).

This policy does not apply to requests for Academic Consideration submitted for **attempted or completed work**, whether online or in person.

The policy also does not apply to students experiencing longer-term impacts on their academic responsibilities. These students should consult [Accessible Education](#).

For procedures on how to submit Academic Consideration requests, please see the information posted on the Office of the Registrar's webpage: [https://registrar.uwo.ca/academics/academic\\_considerations/](https://registrar.uwo.ca/academics/academic_considerations/). All requests for Academic Consideration must be made within 48 hours after the assessment date or submission deadline.

**Important note:** For course elements without flexibility, the policy permits students to request one absence without proof of documentation. The midterm exam is excluded from this policy. Since sufficient flexibility is built into all other course components, all academic consideration requests will require proof of documentation from the relevant Academic Advising department.

## Use of Generative AI Tools

Generative AI tools (e.g., ChatGPT, Copilot, Claude, Gemini) are **permitted, but with significant limitations.**

**For labs**, Generative AI may be used when stuck, but it should be a last resort. Labs are meant to be collaborative with the people in your class rather than with a Generative AI.

**For assignments**, Generative AI can be used for parts of the assignment not directly related to the learning outcomes for that assignment. Each assignment will identify the expected learning outcomes for that assignment with examples provided. All use of Generative AI **MUST be cited** in comments within your code. Any other use of Generative AI (or failure to cite its use) will be considered an academic offence and referred to the department's Academic Integrity Committee.

**For the midterm and final exam**, Generative AI cannot be used. The use of Generative AI will be considered an academic offence and referred to the department's Academic Integrity Committee.

## 6. Additional Statements

### Religious Accommodation

When conflicts arise with a religious holiday that requires an absence from the University or prohibits certain activities, students should request an accommodation for their absence in writing to the course instructor and/or the Academic Advising office of their Faculty of Registration. This notice should be made as early as possible, but not later than two weeks prior to the writing of the examination (or one week prior to the writing of the test).

Please visit the Diversity Calendars posted on our university's EDID website for the recognized religious holidays - <https://www.edi.uwo.ca>

## **Academic Accommodation Policies**

Students with disabilities are encouraged to contact Accessible Education, which provides recommendations for accommodation based on medical documentation or psychological and cognitive testing. The policy on Academic Accommodation for Students with Disabilities 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)

## **General Academic Policies**

The website for Registrar Services is <https://www.registrar.uwo.ca/>.

**Use of @uwo.ca email:** In accordance with policy,

[https://www.uwo.ca/univsec/pdf/policies\\_procedures/section1/mapp113.pdf](https://www.uwo.ca/univsec/pdf/policies_procedures/section1/mapp113.pdf), the centrally administered e-mail account provided to students will be considered the individual's official university email address. It is the responsibility of the account holder to ensure that emails received from the University at their official university address are attended to in a timely manner.

**Requests for Relief** (formally known as "appeals")

Policy on Request for Relief from Academic Decision:

[https://uwo.ca/univsec//pdf/academic\\_policies/appeals/requests\\_for\\_relief\\_from\\_academic\\_decisions.pdf](https://uwo.ca/univsec//pdf/academic_policies/appeals/requests_for_relief_from_academic_decisions.pdf)

Procedures on Request for Relief from Academic Decision (Undergraduate):

[https://uwo.ca/univsec//pdf/academic\\_policies/appeals/undergrad\\_requests\\_for\\_relief\\_procedure.pdf](https://uwo.ca/univsec//pdf/academic_policies/appeals/undergrad_requests_for_relief_procedure.pdf)

## **Scholastic Offences**

Policy on Scholastic Offences:

[https://uwo.ca/univsec//pdf/academic\\_policies/appeals/scholastic\\_offences.pdf](https://uwo.ca/univsec//pdf/academic_policies/appeals/scholastic_offences.pdf)

Procedures on Scholastic Offences (Undergraduate):

[https://uwo.ca/univsec//pdf/academic\\_policies/appeals/undergrad\\_scholastic\\_offence\\_procedure.pdf](https://uwo.ca/univsec//pdf/academic_policies/appeals/undergrad_scholastic_offence_procedure.pdf)

Computer Science Department Policy on Scholastic Offences:

[https://www.csd.uwo.ca/undergraduate/current/policies/scholastic\\_offenses.html](https://www.csd.uwo.ca/undergraduate/current/policies/scholastic_offenses.html)

Computer Science Department Policy on Ethical Conduct:

[https://www.csd.uwo.ca/undergraduate/current/policies/ethical\\_conduct.html](https://www.csd.uwo.ca/undergraduate/current/policies/ethical_conduct.html)

## **Use of Electronic Devices During Assessments**

In courses offered by the Faculty of Science, the possession of unauthorized electronic devices during any in-person assessment (such as tests, midterms, and final examinations) is strictly prohibited. This includes, but is not limited to, mobile phones, smart watches, smart glasses, and wireless earbuds or headphones.

Unless explicitly stated otherwise in advance by the instructor, the presence of any such device at your desk, on your person, or within reach during an assessment will be treated as a *scholastic offence*, even if the device is not in use.

Only devices expressly permitted by the instructor (e.g., non-programmable calculators) may be brought into the assessment room. It is your responsibility to review and comply with these expectations.



## Similarity Checking Software

All assignments may be subject to similarity checking software (e.g., MOSS) to detect plagiarism.

## In the Event of a Lockdown

If, for any reason (e.g., a health lockdown), this course is moved online, the midterm and final exam will be conducted using a remote proctoring service. 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**. Completion of this course will require you to have a reliable Internet connection and a device that meets the technical requirements for this service. More information about this remote proctoring service, including technical requirements, is available on Western's Remote Proctoring website at: <https://remote-proctoring.uwo.ca>.

## Support Services

Please visit the Science & Basic Medical Sciences Academic Advising webpage for information on adding/dropping courses, academic considerations for absences, requests for relief, exam conflicts, and many other academic-related matters: <https://www.uwo.ca/sci/counselling/>.

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

Western is committed to reducing incidents of gender-based and sexual violence and providing compassionate support to anyone who has gone through these traumatic events. If you have experienced sexual or gender-based violence (either recently or in the past), you will find information about support services for survivors, including emergency contacts at [https://www.uwo.ca/health/student\\_support/survivor\\_support/get-help.html](https://www.uwo.ca/health/student_support/survivor_support/get-help.html).

To connect with a case manager or set up an appointment, please contact [support@uwo.ca](mailto:support@uwo.ca).

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. If you have any questions regarding accommodations, you may also wish to contact Accessible Education at [http://academicsupport.uwo.ca/accessible\\_education/index.html](http://academicsupport.uwo.ca/accessible_education/index.html)

Learning-skills counsellors at Learning Development and Success (<https://learning.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.

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 Student Experience website to manage your academics and well-being: <https://studentexperience.uwo.ca>.

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