

Course Syllabus

CP367 Intro to System Programming

Department of Physics and Computer Science, Faculty of Science, Waterloo Campus

Winter | 2024

I acknowledge that in Kitchener, Waterloo, Cambridge and Brantford we are on the traditional territory of the Neutral, Anishnawbe, and Haudenosaunee peoples.

Instructor Information

Name: **Sukhjith Singh Sehra** | Office Location **N2062**

Contact Information: **ssehra@wlu.ca**

Weekly Office Hours: Monday 10:30 AM - 11:30 AM ([MS TEAM Link](#)) or In-person meeting by appointment through email.

Lab Instructor

Name: **David Brown**

Contact Information: **dbrown@wlu.ca**

Course Information

Contemporary ideas and techniques in system programming using the C language. Using and implementing software tools: filters, pipelines, sorts, text patterns and others.

Introduction to Unix operating system and Unix commands. Shell programming in Unix.

Pre-requisites: CP264 | Exclusion: CP217

Lecture Delivery: The lectures will be delivered in-person.

Lecture Timings and Location: MWF 09:30 AM -10:20 AM at Bricker Academic Building Room: BA111

Lab Timings and Location:

Section L1: M 1:30 PM - 2:20 PM Bricker Academic Building Room: BA113

Section L2: W 2:30 PM - 3:20 PM Bricker Academic Building Room: BA113

Course Overview and Approach

This course will provide students with practical and theoretical knowledge of Unix and how to write programs at the system call level. We will explore the theory of system programming using practical contexts and detailed explanations. Through class lectures, students will be exposed to the theory and will have an opportunity to work through examples as a class. The lab component of the course will assist students with key skills from each lecture week.

It is expected that students take detailed notes throughout the lecture, and complete textbook readings in a timely manner. Before asking a question, take a moment to read over your notes, then check the textbook. The answer is likely right in front of your nose! The best way to learn Unix is by USING IT! It is recommended students dedicate significant time to working through assignment problems, and reviewing any in-class examples.

Course Tools and Learning Materials

List here all course tools, learning materials, and supports associated with the course.

- **Required Textbook:** The Unix Workbench, by Sean Kross. Available online for free download. <https://seankross.com/the-unix-workbench/>
- **Suggested Textbook:** Understanding Unix/Linux Programming, A guide to theory and practice. Bruce Molay. Prentice Hall. Available in the bookstore and the library.
- Other resources will be posted on MLS as required.
- **Required Software:** Unix/Linux machine or virtual shell will be required for the course by the end of the first week. For questions, please contact your instructor.
- Other resources will be posted on MLS as required.
- Student success departments - writing centre, math centre, academic advising, study skills/supplemental instruction, accessible learning)

Student Evaluation:

To complete this course, students are required to participate in regular classes, complete labs and assignments, and complete midterm and final exams. To pass this course, students must score at least 50% on the final exam. If the student passes the final exam, then the final score will be the sum of Grades in Assignments, Labs, Midterms, and Final exams as per the following distribution:

Assessment	Weighting
Midterm	30%
Assignments (5-6)	20%
Lab Tasks	10%
Final Exam	40%
Total	100%

Assignment Policy

- Assignments must be submitted at *Gradescope*.
- Assignments will be posted at least one week before the due date.
- All assignments will be equally weighted and count towards the final assignment grade.
- Programs should be written in the style described in the class notes.

- Programs are marked on correctness and style, including internal documentation.
- Programs should be user-friendly and should not crash on bad input. Programs should warn users of bad input.
- Your assignment will not be marked and given credit if it does not run.
- The markers should be able to run your assignment without making any changes to it.
- The assignments should be done individually, and no group work is allowed. The submitted work will be checked for plagiarism. Providing your work to another student for any reason is considered Academic Misconduct.
- *Note:* For the context of this course, any time midnight is mentioned, it should be interpreted as 11:55 pm not 11:59 pm.

Lab Policy

- There will be 11 labs (**no** lab in the **first** week and during the reading week). Your lab instructor will share more details. The weekly schedule is available at <https://bohr.wlu.ca/cp367>.
- All lab work is done individually on your own; no group work is allowed. Providing your work to another student for any reason is considered Academic Misconduct.
- Labs are graded during the lab time. You must attend the lab to get the grade. No make-up labs will be offered.
- For any queries and detailed policies about the lab please direct your questions to the lab instructor.

Course Tentative Schedule

Week #	Date	Lecture #	Content	Assignments
1	08-Jan	Lecture 1	Course Overview and Introduction to C programming	
	10-Jan	Lecture 2		
	12-Jan	Lecture 3		
2	15-Jan	Lecture 4	Editors and Introduction to Unix System	Assignment #1 out Monday @ 11:59 PM
	17-Jan	Lecture 5		
	19-Jan	Lecture 6		
3	22-Jan	Lecture 7	Users, files, and the manual, directories, and file properties	
	24-Jan	Lecture 8		
	26-Jan	Lecture 9		
4	29-Jan	Lecture 10	Processes, I/O redirection, and pipes	Assignment #1 due Monday @ 11:59 PM and Assignment #2 out Monday @ 11:59 PM
	31-Jan	Lecture 11		
	02-Feb	Lecture 12		
5	05-Feb	Lecture 13	Regular Expressions and text Processing	
	07-Feb	Lecture 14		

	09-Feb	Lecture 15		
6	12-Feb	Lecture 16	Regular Expressions, text Processing and makefiles	Assignment #2 due Monday @ 11:59 PM and Assignment #3 out Monday @ 11:59 PM
	14-Feb	Lecture 17		
	16-Feb	Lecture 18		
7	19-Feb	Reading Week		
	21-Feb			
	23-Feb			
8	26-Feb	Midterm		
	28-Feb	Lecture 19	Shell programming	Assignment #3 due Wednesday @ 11:59 PM and Assignment #4 out Wednesday @ 11:59 PM
	01-Mar	Lecture 20		
9	04-Mar	Lecture 21	Shell programming	
	06-Mar	Lecture 22		
	08-Mar	Lecture 23		
10	11-Mar	Lecture 24	Shell programming and debugging	Assignment #4 due Monday @ 11:59 PM and Assignment #5 out Monday @ 11:59 PM
	13-Mar	Lecture 25		
	15-Mar	Lecture 26		
11	18-Mar	Lecture 27	Secure shell and Terminal control and signals	
	20-Mar	Lecture 28		
	22-Mar	Lecture 29		
12	25-Mar	Lecture 30	Threads and concurrency	Assignment #5 due Monday @ 11:59 PM and Assignment #6 out Monday @ 11:59 PM
	27-Mar	Lecture 31		
	29-Mar	No Class (Good Friday)		
13	01-Apr	Lecture 32	Git and GitHub	
	03-Apr	Lecture 33		
	05-Apr	Lecture 34		
14	08-Apr	Lecture 35	Review	Assignment #6 due Monday @ 11:59 PM

Missed Assignments

An assignment not handed in receives a mark of Zero unless there is a documented reason. If a documented reason is supplied, the weight of the missing assignment is shifted to the final exam. A copy/original of the documented reason must be given to and approved by the instructor.

Midterm Exam

(Tentative) Monday, February 26, 2024. Time: 09:30 AM - 10:20 AM. The Instructions would be posted on the Myls Page before the exam date.

Missed Midterm

A missed midterm exam will receive a Zero mark unless there is a valid documented reason. Weight shifting is only given to students with verifiable extenuating circumstances. An extenuating circumstance is a rare and severe event for which a student has no control or cannot anticipate (for example, a serious accident or emergent medical condition).

Final Exam

To be announced by the registrar's office. If you are considering registering for a special examination or event, you should select a time outside the examination period. Consult Academic Regulations in the Academic Calendar for special circumstances for examination deferment.

Getting Help

- MyLearningSpace: You should frequently visit your instructor's CP367 webpage on Myls. It contains information pertinent to the course.
- Use discussion forum on Myls: You are encouraged to post your questions on the discussion forum at Myls. For each chapter and assignment, you would see a thread where you can post the questions. Make sure to review earlier posts to check if your question had not been answered.
- If the issue/question is not appropriately addressed, you should consult your instructor without delay through email or during office hours are given on page 1. Please do not email me via Myls and, do not make any submissions through email as it gets automatically flagged as spam.

University and Course Policies

1. **Academic Calendars:** Students are encouraged to review the Academic Calendar for information regarding all important dates, deadlines, and services available on campus.
2. **Special Needs:** Students with disabilities or special needs are advised to contact Laurier's Accessible Learning Centre for information regarding its services and resources.

Academic Integrity/Misconduct (cheating, plagiarism): The University has a defined policy with respect to Academic Misconduct; penalties are always severe and enforced. You are responsible for familiarizing yourself with the academic misconduct policy and penalty guidelines and are cautioned that, in addition to failure in a course, students may be suspended or expelled from the University for academic misconduct, and the offence may appear on their transcripts. The relevant policy can be found at Laurier's Academic Integrity website along with resources to educate and support you in upholding a culture of integrity. Ignorance of Laurier's academic misconduct policy is

not a defence. Academic misconduct includes, but is not limited to, transmission or reception of information, or possession of unauthorized information, during laboratories, quizzes, tests, or examinations. Academic misconduct also includes plagiarism. Wilfrid Laurier University uses software that can check for plagiarism. If requested to do so by the instructor, students are required to submit their written work in electronic form and have it checked for plagiarism. WLU [Policy 12.2 Student Code of Conduct and Discipline](#) provides information on academic and research misconduct code, and the procedures for investigating and determining appropriate disciplinary measures for breaches of this Code. The following, but not limited to, are violations of Laurier's Academic Code of Conduct:

- Accessing unauthorized resources (Google, chat rooms, Chegg, Reddit, etc.) for assessments.
- Using technological aids beyond what is listed as permitted in an assessment.
- Posting tests, assignments, lab or exam questions to message boards, social media, or other unauthorized websites (ex. Chegg or CourseHero). While these third parties claim to be tutoring resources, for a fee they take your work and share it with other students; an act that constitutes an action of academic misconduct.
- Copying the work of others by way of file or image sharing.
- Posting tests, assignments, lab or exam questions and answers in virtual "course groups" (ex. Facebook, Discord or WhatsApp).
- Copying the work that is shared or posted in virtual "course groups" (ex. Facebook, Discord or WhatsApp).
- Working collaboratively with others on assessments that are expected to be completed individually.
- Copying the work of others by writing down answers that they tell you, but that you did not independently determine.
- Backdating emails to gain more time to complete assessments.

We have recently experienced an increase in the volume of people gaining unauthorized access to digital resources by using another's computer. It is your responsibility to keep your digital documents secure and maintain confidentiality. Do not leave your computer unattended, especially during group activities, and be diligent to log out of pages where you store digital files.

If you have questions about how to conduct yourself when completing course assessments, including using **Generative Artificial Intelligence**, you should contact your course or lab instructor for guidance. If you have general questions, please communicate to scienceintegrity@wlu.ca.

- 3. Intellectual Property:** The educational materials developed for this course, including, but not limited to, lecture notes and slides, handout materials, examinations and assignments, and any materials posted to MyLearningSpace, are the intellectual property of the course instructor. These materials have been developed for student use only and they are not intended for wider dissemination and/or communication outside of a given course. Posting or providing unauthorized audio, video, or textual material of lecture content to third-party websites violates an instructor's intellectual property

rights, and the Canadian Copyright Act. Recording lectures in any way is prohibited in this course unless specific permission has been granted by the instructor. Failure to follow these instructions may be in contravention of the university's Code of Student Conduct and/or Code of Academic Conduct and will result in appropriate penalties. Participation in this course constitutes an agreement by all parties to abide by the relevant University Policies, and to respect the intellectual property of others during and after their association with Wilfrid Laurier University.

- 4. Late Assignment Policy:** Late assignments are not accepted. An assignment not handed in receives a **Zero** mark unless there is a documented reason. If a documented reason is supplied, the weight of the missing assignment is shifted to the final exam. A copy of the documented reason must be given to and approved by the instructor.
- 5. Final Examinations:** Students are strongly urged not to make any commitments (i.e., vacation) during the examination period (**April 11 - April 27**). Students are required to be available for examinations during the examination periods of all terms in which they register. Refer to the Handbook on Undergraduate Course Management for more information.
- 6. Classroom Use of Electronic Devices - see Policy 9.3 (Approved by Senate March 8, 2012)**
- 7. Other course policies**
 - Students will have two weeks after marks are posted to raise any concerns about the marks. After two weeks, no changes will be made. It is the responsibility of the student to ensure all grades are posted in MyLearningSpace. The instructor reserves the right to remark on the entire paper.
 - Grades will not be changed after the final exam has ended regardless of circumstances. If you are missing your marks email your Instructional Assistant/Marker immediately.

General Regulations

Course Drop Dates

Please refer to the Undergraduate Academic Calendar - Academic Dates **Winter term 2024** - for details, of course, add/drop dates, etc.

Accessible Learning Centre

Students with disabilities or special needs are advised to contact Laurier's Accessible Learning Centre for information regarding its services and resources, ext. 3086. Students are encouraged to review the Calendar for information regarding all services available on campus.

Learning Services

There is a range of academic learning support services offered at Laurier designed for all students who want to improve their academic achievement in the classroom. These services include the following specific areas:

- Central Academic Advising Office
- Mathematics Assistance Centre
- Study Skills and Supplemental Instruction Centre
- Writing Centre

- Visit the Learning Services web page for detailed information.

Laurier Email Account

Our official means of communication is with your Laurier email account. Students are expected to regularly check their Laurier email account for important notices from the university community. Students are also expected to send emails to official members of the university community from their Laurier email account to ensure delivery.

Foot Patrol, the Wellness Centre, and the Student Food Bank:

Multi-campus Resource:

- Good2Talk is a postsecondary school helpline that provides free, professional, and confidential counselling support for students in Ontario. Call 1-866-925-5454 or through 2-1-1. Available 24-7.

Kitchener/Waterloo Resources:

- Waterloo Student Wellness Centre: 519-884-0710, x3146. The Centre supports the physical, emotional, and mental health needs of students. The Student Wellness Centre is operational from 9 am to 4 pm Monday through Thursday. Effective Monday April 20, we will be closed over the lunch-hour from 12 to 1 pm. Please call to book an appointment with a physician, nurse, mental health nurse, or counsellor, After-hours crisis support available 24/7. Call 1-844-437-3247 (HERE247).
- EMERGENCY RESPONSE TEAM 519.885.3333. The Emergency Response Team provides on-call medical assistance to students on campus. ERT operates Monday through Wednesday 3pm-3am and Thursday to Sunday 24 hours. ERT can also be booked for on site event support by filling out the online booking request form at ert.yourstudentsunion.ca. Operating on the Waterloo campus only.
- Student Rights Advisory Committee. The Student Rights Advisory Committee exists to provide you with information about your rights when it comes to landlord-tenant issues or academic appeals. While in no way legal representation, it can help to inform you about your options to make difficult situations easier to navigate.