DEPARTMENT OF MATHEMATICAL AND COMPUTATIONAL SCIENCES
UNIVERSITY OF TORONTO MISSISSAUGA

CSC209H5S LEC9101
Software Tools and Systems Programming
Course Outline - Winter 2022

Class Location & Time	Mon, 03:00 PM - 05:00 PM IB 245
Instructor	Andrew Petersen
Office Location	DH3096
Office Hours	Tues and Thu 1:30-2:30 (DH3096), Wed 10:00-11:00 (Zoom)
E-mail Address	andrew.petersen@utoronto.ca
Course Web Site	https://q.utoronto.ca
Co-Instructor	Andi Bergen
Office Location	DH3084
Office Hours	Mon 2:00-3:00, Tue 1:00-3:00
E-mail Address	andi.bergen@utoronto.ca

Course Description

Software tools and development in a Unix/Linux environment, using a machine-oriented programming language (typically C). Core topics: software tools (shell utilities and make), processes and program execution, the memory model, system calls, file processing, interprocess communication (pipes and signals), and an introduction to concurrency, including multithreading. [24L, 12P]

Prerequisite: CSC207H5
Exclusion: CSC209H1 or CSCB09H3 (SCI)
Distribution Requirement: SCI

Students who lack a pre/co-requisite can be removed at any time unless they have received an explicit waiver from the department. The waiver form can be downloaded from here.

Textbooks and Other Materials

The course website (on quercus) will be used to post readings and other important information, and the discussion board will be used for answering students' questions. **Both are required reading**:

- Course website: https://q.utoronto.ca/courses/251356
- Discussion board: https://piazza.com/utoronto.ca/winter2022/csc209

Videos and required exercises to be completed before each class are hosted on PCRS (and is linked to from the course website): https://pcrs.utm.utoronto.ca/209/

Aside from the above materials, you may find it useful to have good C and syscall references handy. Recommended (but optional) readings will be posted from these textbooks:

- King. C Programming: A Modern Approach. W. W. Norton and Company, 2008.
- Kerrisk. The Linux Programming Interface. No Starch Press, 2010.

Assessment and Deadlines

Type	Description	Due Date	Weight
Other	Weekly Prep on PCRS: 1% each, 9 weeks	On-going	9%
Lab	2% each, best 8 of 10	On-going	16%
Assignment	Documentation Assignment	2022-02-11	5%
Assignment	mysh Project	2022-04-08	15%
Other	mysh Project milestones: 2% each, best 5 of 6	On-going	10%

Term Test	Midterm held outside of class at 17:00	2022-02-16	15%
Final Exam	Minimum of 40% on final exam required to pass the course	TBA	25%
Other	Float (added to weight of higher of midterm or exam)	On-going	5%
		Total	100%

More Details for Assessment and Deadlines

At least until January 31 (and as directed by the university administration), lectures, practicals, and office hours will take place on Zoom. Please log on from a quiet, distraction-free environment. During lecture portions, please ensure that your microphone is muted. You may post in the public chat for other students to answer; your instructor is not likely to be able to respond to chat questions during class. For small-group activities, we will use breakout rooms in the Zoom meeting or other suitable technologies, during which we hope you'll share your voice and face.

The following paragraphs describe the work assigned this term. All work is to be completed individually.

Weekly Prep and Lab Exercises

Research consistently shows us that students remember only a small fraction of what we present in lecture. It is not easy to make sense of material that you see for the first time in the first half-hour of a fast-paced lecture environment, let alone to stay focused for 2 hours. It's also important to space out your studying (spaced repetition). To prime you for what we will discuss, you will view a set of videos and complete exercises by Monday at noon (Toronto time), before the first lecture of the week. In some weeks, the videos will be supplemented or replaced by recommended readings and an activity. These are the "Preparation" exercises hosted on PCRS: https://pcrs.utm.utoronto.ca/209/

The labs are held in the PRA sections (on Wednesday). Labs will be held in ten weeks of the course (not the first or last weeks) and consist of a small number of focused, practical exercises. Each is worth 2%. We will drop the lowest 2 lab marks.

Documentation Assignment

The documentation assignment will ask you to create a*linux man page* for a new command. You'll be evaluated on your adherence to the conventions of a man page, the accuracy and completeness of the documentation, and the quality of your writing. After your assignment is marked, you may earn an additional 1% bonus by submitting a revised version that accounts for the feedback that you receive. Your revised version should be submitted with changes tracked to highlight the differences in your document.

Project and Milestones

Over the course of the entire term, you will be building a linux shell (mysh). We're using a project, instead of individual assignments, to encourage you to write extensible, modular, and well documented code, as you will need to update and extend your project throughout the term.

The final project is due on April 8 at 17:00. This work may not be submitted late, as it is due on the last day of class. We will evaluate your final submissions against the full set of requirements for the shell.

In addition, we will be releasing six "milestones" -- subsets of the requirements that will guide you to build the fully functioning shell. Each milestone has its own due date and is worth 2%. In addition, you will receive a 1% bonus on that milestone if you submit a milestone on time and pass at least 70% of the tests.

You may resubmit your milestones as many times as necessary to get full credit. You may even submit after the deadline (using **grace tokens**), though submissions after the original deadline are not eligible for the 1% bonus. You will receive**ten grace tokens**. Each grace token can be used to obtain a **twelve-hour** extension for a milestone. If you use all of your grace tokens on a single milestone, you can submit it up to five days late, but we recommend that you use them carefully, to manage your workload through the busier parts of the term.

MarkUs automatically deducts grace tokens when you submit an assignment late. You do**not** need to explicitly say you are using a grace token. Just submit your work within the grace token twelve-hour periods.

No other late work will be accepted. If you are at risk of missing a deadline due to a busy week, you should hand in a working (and tested) version of a program that accomplishes a subset of the requirements. In the event of an illness or other catastrophe, please contact Professor Bergen and provide supporting documentation. You must also declare your absence on Acorn. Do not wait until the due date has passed. It is always easier to make alternate arrangements well before the due date.

Autotesting

As your assignments and labs are submitted electronically and will often be tested using an automated testing program, you must follow the submission instructions exactly. Any program that does not compile on a CS lab machine or that crashes (e.g., seg fault or bus error) **on any test** will receive a grade of 0 as it cannot be tested. Check your submission carefully; verify that you have submitted exactly the files you intended to submit and that they compile on a lab machine.

Midterm and Final Exam

There is one midterm, to be held outside of class on Wednesday, February 16, from 17:00-19:00 (Toronto time). Please let Professor Bergen know as soon as possible if you have a conflict with another course that needs to be accommodated.

The final exam is comprehensive and takes place after classes are over. To pass the course you must receive at least 40% on the final exam. The highest mark you will receive if your grade on the final exam is less than 40% is 47%. The final exam schedule is not yet available but will be posted later in the term. We will make an announcement once the registrar's site has final exam information.

Penalties for Lateness

No late work is accepted outside of the stated grace token policy.

Procedures and Rules

Missed Term Work

In order to receive special consideration, you must email the course coordinator and declare your absence on ACORN. For more information, visit the Office of the Registrar website (https://www.utm.utoronto.ca/registrar/utm-absence).

In the event of an illness or other catastrophe, please contact Professor Bergen and provide supporting documentation. You must also declare your absence on Acorn.

Missed Final Exam

Students who cannot complete their final examination due to illness or other serious causes must file an online petition **within 72 hours of the missed examination**. Late petitions will **NOT** be considered. Students must also record their absence on ACORN on the day of the missed exam or by the day after at the latest. Upon approval of a deferred exam request, a non-refundable fee of $70 is required for each examination approved.

Academic Integrity

Academic integrity is essential to the pursuit of learning and scholarship in a university, and to ensuring that a degree from the University of Toronto Mississauga is a strong signal of each student's individual academic achievement. As a result, UTM treats cases of cheating and plagiarism very seriously. The University of Toronto's Code of Behaviour on Academic Matters outlines behaviours that constitute academic dishonesty and the process for addressing academic offences. Potential offences include, but are not limited to:

In papers and assignments:

1. Using someone else's ideas or words without appropriate acknowledgement.
2. Submitting your own work in more than one course, or more than once in the same course, without the permission of the instructor.
3. Making up sources or facts.
4. Obtaining or providing unauthorized assistance on any assignment.

On tests and exams:

1. Using or possessing unauthorized aids.
2. Looking at someone else's answers during an exam or test.

3. Misrepresenting your identity.

In academic work:

1. Falsifying institutional documents or grades.
2. Falsifying or altering any documentation required, including (but not limited to) doctor's notes.

Keep in mind that the department uses software that compares programs for evidence of similar code. Below are some tips to help you avoid committing an academic offence, like plagiarism.

- Never look at another student's lab/assignment solution(s). Never show another student your lab/assignment solution. This applies to all drafts of a solution and to incomplete and even incorrect solutions.
- Keep discussions with other students focused on concepts and examples. Never discuss labs/assignments before the due date with anyone but your Instructors and your TAs.
  Do not discuss your solution publicly on the discussion board or publicly in the lab rooms/office hours.

All suspected cases of academic dishonesty will be investigated following procedures outlined in the Code of Behaviour on Academic Matters. If you have questions or concerns about what constitutes appropriate academic behaviour or appropriate research and citation methods, you are expected to seek out additional information on academic integrity from your instructor or from other institutional resources.

Plagiarism Detection

Normally, students will be required to submit their course essays to the University's plagiarism detection tool for a review of textual similarity and detection of possible plagiarism. In doing so, students will allow their essays to be included as source documents in the tool's reference database, where they will be used solely for the purpose of detecting plagiarism. The terms that apply to the University's use of this tool are described on the Centre for Teaching Support & Innovation web site (https://uoft.me/pdt-faq).

Students may wish to opt out of using the plagiarism detection tool. In order to opt out, contact your instructor by email no later than two (2) weeks after the start of classes. If you have opted out, then specific information on an alternative method to submit your assignment can be found below.

Final Exam Information

Duration:	2 hours
Aids Permitted:	None

Additional Information

If you feel there was an error in the marking of an assignment or test, you may request a remark directly on MarkUs. Remark requests **must be received within three days** of when your received the grade for that item.

You must provide a specific reason for the request, referring to a possible error or omission by the marker. Stating specific potential grading errors
for your remark request is **mandatory for us to consider your request. We will review your entire work**, not just the items you pointed out.

Please keep in mind that **your grade may stay the same, may increase, or may even decrease** after your remark request is assessed.

Last Date to drop course from Academic Record and GPA is March 13, 2022.