

Carleton University School of Computer Science  
**COMP 2401 / COMP 2001**  
Introduction to Systems Programming  
2013 Winter

*Preliminary course outline subject to change; last updated on Sat Jan 5 22:45:04 EST 2013*

## Class Schedule

<b>Classroom:</b>	Tory Building 210
<b>Class Times:</b>	Monday and Wednesday 8:35 am - 9:55 am
<b>Course Website:</b>	<a href="http://people.scs.carleton.ca/~mjhinek/W13/COMP2401/">http://people.scs.carleton.ca/~mjhinek/W13/COMP2401/</a>

## Teaching Assistants

*T.A. assignments are not available at this time*

## Course Description

Introduction to system-level programming with fundamental OS concepts, procedures, primitive data types, user-defined types. Topics may include process management, memory management, process coordination and synchronization, inter-process communication, file systems, networking, pointers, heap and stack memory management, and system/library calls.

## Topics Covered

The course will cover the following topics (not necessarily in this order), although some material may be omitted due to time constraints:

- **Introduction**
  - Basics of computer organization
  - Basics of operating systems
  - Basics of C programming
- **Unix/Linux**
  - Basics of unix/linux shell
  - Commands, command line arguments, redirection and piping
  - Basics of make and using a makefile
  - Basics of using a debugger (dbg)
  - Shell programming [extra]
- **Data Representation**
  - Primitive data types
  - Compound data types
  - Pointers
- **Memory Management**
  - Stack and heap
  - Dynamic memory allocation
  - Linked lists
- **Program Structure**
  - Program building

- Procedural program design
- Program organization
- I/O
- **Concurrent Computing**
  - Concurrent systems
  - Processes (signals, sockets)
  - Threads
- **Libraries**
  - Working with libraries
  - Curses library
  - X library

## Prerequisites

COMP 1406/1006

## Textbook (s)

### Main textbooks:

- Adam Hoover, *System Programming with C and Unix*, Addison-Wesley, 2010.
- Scott Granneman, *Linux Phrasebook*, Sams Publishing, 2006.

### Other references:

- Randal E. Bryant and David R. O'Hallaron, *Computer Systems: A Programmer's Perspective*, Prentice-Hall, 2011.
- Brian W. Kernighan and Dennis Ritchie, *The C Programming Language*, 2nd edition, Prentice Hall, 1988. ISBN: 0131103628

## Online and Other Resources

We will use the following online resources:

- Course webpage (<http://people.scs.carleton.ca/~mjhinek/W13/COMP2401/>) for posting assignments and announcements.
- Piazza (<https://piazza.com/class#winter2013/comp24012001>) will be used as our class forum (and for posting announcements).
- cuLearn (<https://www.carleton.ca/culearn/>) will be used to submit assignments, post tutorials and check marks.

In addition, the following resources may be useful to you

- the Computer Science Tutorial Assistance Centre (**CSTAC**), 1170 Herzberg. A drop-in to ask questions about anything related to this this course (and CS in general).
- the Student Academic Success Centre, 406 MacOrdum Library

## Laboratory Software

All work will be done in a linux environment. In the lab (HP 4155), you can use Virtual Box and run Ubuntu or you can use your own laptop.

## Evaluation

Students will be evaluated in this course according to the following measures.

Component	Weight	Due Date
Assignments	40%	TBA
Tutorials	10%	Each week starting January 7th
Midterm	20%	Monday March 4th
Final Exam	30%	TBA

## Evaluation Note

In order to pass the course, your weighted exam average (midterm and final) must be at least 40%. If your weighted exam mark is below 40, your final mark will be your weighted exam mark.

**Appeals:** All assignment and midterm appeals must be made no later than two weeks after they have been returned to the class (either electronically via cuLearn or handed back in class). For assignment appeals please email the teaching assistant that marked your assignment. Midterm appeals must be made in writing and given to the instructor.

## Tutorials

Tutorials are held in HP 4155 on Mondays from 11:35am until 12:55pm.

- Tutorials begin during the week of January 7. There will be no tutorials during the week of Feb. 18.
- Tutorial attendance is **mandatory** and will be counted towards your final grade.
- During your tutorial session, you **must** work on the assigned tutorial provided. Anyone not working on the tutorial will be asked to leave the room.
- Your tutorial grade is based on attendance and participation. You will receive no marks if you are absent for any reason or if you do other work during the session.

## Midterm Note

The midterm will be Monday March 4th **during the tutorial time** in HP 4155.

## Assignments

There will be four (4) or five (5) assignments in this course, and they will be accessible from the course web page. Assignments must be submitted on Carleton's [cuLearn](#) BEFORE the due date and time. **NO LATE ASSIGNMENTS WILL BE ACCEPTED.**

Submit early and often. Your final submission (before the due date) will be marked.

Assignments will be tested from a bash shell on one of the lambda machines (scs linux machines). Your code must compile and work on these machines.

## Attendance

Class attendance is **strongly** recommended.

## Collaboration Policy

Unless otherwise stated, collaborating on assignments is strictly disallowed. You must complete the

work by yourself. If you need help, please see a TA or your instructor. Posting assignment solutions on discussion boards before the due date and time is also prohibited.

## SCS Computer Accounts

Any student taking an SCS course qualifies to have an SCS account. SCS accounts can be created at the following URL: <http://www.scs.carleton.ca/newacct>. SCS students can access one of the designated labs for your course. The labs are operational 7 days a week 24 hours per day, please be advised that the building will be closed overnight, Mon. - Fri. 23:00 - 8:00 and on weekends from 17:00 - 8:00. Technical support is available in room HP5161 Monday to Friday from 9:00 until 17:00. All SCS account related information is accessible at the following URL: <http://www.scs.carleton.ca/nethelp>.

## Undergraduate Academic Advisor

The Undergraduate Advisor for the School of Computer Science is available in Room 5302C HP, by telephone at 520-2600, ext. 4364 or by email at [undergraduate\\_advisor@scs.carleton.ca](mailto: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.

## University Policies

### Student Academic Integrity Policy

Every student should be familiar with the Carleton University student academic integrity policy. A student found in violation of academic integrity standards may be awarded penalties which range from a reprimand to receiving a grade of F in the course or even being expelled from the program or University. Some examples of offences are: plagiarism and unauthorized co-operation or collaboration. Information on this policy may be found in the Undergraduate Calendar.

### 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". Such reported offences will be reviewed by the office of the Dean of Science.

### Unauthorized Co-operation or Collaboration

Senate policy states that "to ensure fairness and equity in assessment of term work, students shall not co-operate or collaborate in the completion of an academic assignment, in whole or in part, when the instructor has indicated that the assignment is to be completed on an individual basis". Please refer to the course outline statement or the instructor concerning this issue.

### Academic Accommodations for Students with Disabilities

The Paul Menton Centre for Students with Disabilities (PMC) provides services to students with Learning Disabilities (LD), psychiatric/mental health disabilities, Attention Deficit Hyperactivity Disorder (ADHD), Autism Spectrum Disorders (ASD), chronic medical conditions, and impairments in mobility, hearing, and vision. If you have a disability requiring academic accommodations in this course, please contact PMC at 613-520-6608 or [pmc@carleton.ca](mailto:pmc@carleton.ca) for a formal evaluation. If you are already registered with the PMC, contact your PMC coordinator to send me your Letter of Accommodation at the beginning of the term, and 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 me to ensure accommodation arrangements are made. Please consult the PMC website for the deadline to request accommodations for the formally-scheduled exam (if applicable) at <http://www2.carleton.ca/pmc/new-and-current-students/dates-and-deadlines/>

### Religious Obligation

Write to me 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://www2.carleton.ca/equity/>

### Pregnancy Obligation

Write to me 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://www2.carleton.ca/equity/>

## **Medical Certificate**

The following is a link to the official medical certificate accepted by Carleton University for the deferral of final examinations or assignments in undergraduate courses. To access the form, please go to <http://www.carleton.ca/registrar/forms>