

Distributed OS: Winter 2023 Course Outline

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Course Information

- **Course Number:** COMP 4000/5102
- **Term:** Winter 2023
- **Title:** Distributed Operating Systems
- **Institution:** Carleton University, School of Computer Science
- **Instructor:** Anil Somayaji (<http://people.scs.carleton.ca/~soma>) (anil.somayaji at carleton.ca).
Office hours by appointment online.

- **Teaching Assistant:** Nilofar Mansourzadeh (NilofarMansourzadeh at cmail.carleton.ca). Office hours TBD, online
- **Meeting Time:** Mon. & Wed. 11:35-12:55, **online**, January 9 to April 10, 2023.
- **Course Website:**
https://homeostasis.scs.carleton.ca/wiki/index.php/Distributed_OS:_Winter_2023

Official Course Descriptions

COMP 4000: An advanced course emphasizing the principles of distributed operating systems including networking protocols, distributed file systems, remote IPC mechanisms, graphical user interfaces, load balancing, and process migration. Case studies include current "standards" as well as novel systems under development. Prerequisite(s): (COMP 3000 or SYSC 4001) and (COMP 3203 or SYSC 4602).

COMP 5102: Design issues of advanced multiprocessor distributed operating systems: multiprocessor system architectures; process and object models; synchronization and message passing primitives; memory architectures and management; distributed file systems; protection and security; distributed concurrency control; deadlock; recovery; remote tasking; dynamic reconfiguration; performance measurement, modeling, and system tuning. Prerequisite(s): COMP 3000 and COMP 3203 or equivalent.

Communication

The [main wiki page](#) is the canonical source of information on this course. Please refer to it for updates. Brightspace (<http://brightspace.carleton.ca>) will be used for submitting written work. Otherwise, most out-of-class communication will happen through [Microsoft Teams](#) (<https://teams.microsoft.com>). Please see Brightspace for the invitation link.

Classes will be held online via Zoom. The link is available through Brightspace.

Required Textbooks/Software

There are no required textbooks or software for this course. Instead we will be reading research papers which will be linked to from the wiki. While many of these papers will be available directly via web search, some will be behind paywalls. In this case there will be alternate links to those pages that go through the Carleton Library's proxy.

Grading

Students enrolled in COMP 4000 (undergraduates) will receive the best grade as calculated by one of three grading schemes. Students enrolled in COMP 5102 (mostly graduate students) are not eligible for the "Exams only" grading scheme. In other words, the project is optional for undergraduates and mandatory for graduate students.

Note that other grading schemes may be used to calculate final grades; the grading schemes below represent the minimum grade students will receive.

Exams only

- 10% Attendance

- 10% Reading responses
- 20% Group Reports
- 24% Midterm (February 15th, in class, online)
- 36% Final (during the Final Exam Period)

Tests and Project

- 10% Attendance
- 10% Reading responses
- 20% Group Reports
- 12% Midterm (February 15th, in class, online)
- 18% Final (during the Final Exam period)
- 5% Project Proposal (February 27th)
- 5% Project Presentation (Last two weeks of class)
- 20% Final Project (due 5 days after the Final Exam)

Project only

- 10% Attendance
- 10% Reading responses
- 20% Group Reports
- 10% Project Proposal (February 27th)
- 10% Project Presentation (Last two weeks of class)
- 40% Final Project (due 5 days after the Final Exam)

Class Attendance

You are expected to attend every class online for this course. Attendance will be taken every class via Zoom logs. If you are late to class, you will only receive partial marks for attending that class.

Note that if you miss class you will be unable to participate in group discussions and will thus not be able to submit a group report.

Reading Responses

At the beginning of each week you should submit an all-text reading response on Brightspace that is 500 words in length or less. Responses longer than 600 words may be marked off for verbosity. Your responses should say what you found interesting in the week's assigned readings and what you have questions about/were confused by. Where appropriate, they should also discuss the relationship between the papers of the week and other work that you know about (including those covered earlier in class).

Do not summarize the readings. Instead you should be telling us what you got out of these papers, good and bad. Please also tell me what issues you'd like to learn more about, either in class or potentially through later readings.

Responses will be graded on a scale of 0 to 4, with a 4 being given for a response that has clear evidence that you made an effort to read and understand all of the assigned readings.

Please submit your responses in plain text or PDF format. (No MS Word files! Please convert to PDF or text before submitting.) You may want to consider writing your response as a text file formatted in [Markdown](http://en.wikipedia.org/wiki/Markdown) (<http://en.wikipedia.org/wiki/Markdown>) and then convert the output to PDF using [pandoc](http://johnmacfarlane.net/pandoc/) (<http://johnmacfarlane.net/pandoc/>).

Responses submitted after class will be accepted for credit, but with a maximum grade of 3, not 4.

Group Reports

On a regular basis the class will be divided into groups. Each group will be responsible for recording the discussion around one or more papers that were discussed during the week. The recorded discussion should be in a form such that someone who has not read the paper or participated in the discussion can understand it. Thus, the discussion summary should also include a summary of the paper in some form.

Project

The project may be a literature review of a specialized area of computer science related to distributed operating systems, or it may be a research proposal on a problem related to distributed operating systems. A research proposal should be thought of as an abbreviated literature review paper combined with a description of potential future work that would fill a gap in the covered literature.

You may choose to follow up on your proposal and actually implement what you propose; given the implementation complexity of most research problems in distributed operating systems, though, such an implementation is strictly optional (but may be advisable if you wish to make your project publishable).

Your project outline should consist of a title, abstract, an argument outline, and at least ten references that you plan to cite in your final project.

You should run ideas for your project by Prof. Somayaji before writing your proposal before you spent time making your outline.

Collaboration

Collaboration on all work is allowed except for the midterm and final exams. Collaboration, however, should be clearly acknowledged. Specifically, co-authored works should be marked as such. When co-authored, all authors of reading responses and projects will get the same grade, unless there is reason to believe that some co-authors did not in fact contribute significantly to the submitted work. Co-authored contributions may get different grades depending upon the relative contribution of the different authors; however, the default here will also be to give all authors the same grade.

It is **essential** that outside references be cited appropriately. Proper citation format should be followed except where more relaxed forms are specifically allowed.

Plagiarism or intellectual dishonesty of any kind is strictly forbidden. In other words, it should always be clear what is your work and what is the work of others. If anything you submit is, in part or whole, very similar in content or structure to that of work produced by someone else, you are plagiarizing. This includes figures.

Think of plagiarism as a kind of unauthorized collaboration. Don't do it. Plagiarism and other instructional offenses will be reported to the Dean of Science for disciplinary action, as per university guidelines.

University Policies & Resources

Undergraduate/Graduate Academic Advisors

The undergraduate advisor for the School of Computer Science is available in Room 5302 HP, by telephone at 520-2600, ext. 4364, or by email at undergraduate_advisor@scs.carleton.ca. The graduate advisor for the School of Computer Science is available in Room 5302B HP, by telephone at 520-2600, ext. 8751, or by email at grad@scs.carleton.ca. These advisors can assist with information about prerequisites and preclusions, course substitutions/equivalencies, understanding your academic audit and the remaining requirements for graduation. They will also refer students to appropriate resources such as the Science Student Success Centre, Learning Support Services and the Writing Tutorial Services.

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 see above for the specific collaboration policy for this course.

Requests for Academic Accommodation

You may need special arrangements to meet your academic obligations during the term. For an accommodation request, the processes are as follows:

Pregnancy obligation

Please contact your instructor 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: <https://carleton.ca/equity/wp-content/uploads/Student-Guide-to-Academic-Accommodation.pdf>

Religious obligation

Please contact your instructor 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: <https://carleton.ca/equity/wp-content/uploads/Student-Guide-to-Academic-Accommodation.pdf>

Academic Accommodations for Students with Disabilities

If you have a documented disability requiring academic accommodations in this course, please contact the Paul Menton Centre for Students with Disabilities (PMC) at 613-520-6608 or pmc@carleton.ca for a formal evaluation or contact your PMC coordinator to send your instructor your Letter of Accommodation at the beginning of the term. You must also contact the PMC 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 your instructor as soon as possible to ensure accommodation arrangements are made. carleton.ca/pmc

Survivors of Sexual Violence

As a community, Carleton University is committed to maintaining a positive learning, working and living environment where sexual violence will not be tolerated, and is survivors are supported through academic accommodations as per Carleton's Sexual Violence Policy. For more information about the services available at the university and to obtain information about sexual violence and/or support, visit: <https://carleton.ca/sexual-violence-support>

Accommodation for Student Activities

Carleton University recognizes the substantial benefits, both to the individual student and for the university, that result from a student participating in activities beyond the classroom experience. Reasonable accommodation must be provided to students who compete or perform at the national or international level. Please contact your instructor 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. <https://carleton.ca/senate/wp-content/uploads/Accommodation-for-Student-Activities-1.pdf>

For more information on academic accommodation, please contact the departmental administrator or visit: <https://students.carleton.ca/course-outline>

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 <https://www.carleton.ca/registrar/forms>

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