Course Information

Instructor: Steph Durocher
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Web: www.cs.umanitoba.ca/~comp2080

Lectures: 11:30 am–12:45 pm, Tu. & Th. in Education 224
Office hour: 2:30–3:30 pm Tuesday

Course Description. Methods of analyzing the time and space requirements of algorithms, average case and worst case analysis, models of computation

Course Goals and Intended Learning Outcomes. COMP 2080 introduces common techniques for algorithm analysis and algorithm design.

Syllabus. Topics to be covered in the course will include the following, subject to change at the discretion of the instructor and based on the learning needs of the students.

- Algorithm Analysis
  - Expressing cost in terms of input size
  - Simplifying expressions using asymptotic notation: $O, \Omega, \Theta, o, \omega$
  - Expressing the cost of recursive algorithms using recurrence relations
- Algorithm Design
  - Divide-and-conquer algorithms
  - Greedy algorithms
  - Dynamic programming

Prerequisites. The formal course requirements are as follows. Student must have completed the following courses with a minimum grade of:

- C or higher in an undergraduate course in discrete mathematics (COMP 2130 or MATH 1240)
- C or higher in an undergraduate course in data structures and algorithms (COMP 2140)

It is recommended for students to have completed:

- an undergraduate course in statistics (STAT 1000)

Textbook. The following books are recommended:

- Algorithms by Dasgupta, Papadimitriou, and Vazirani, McGraw Hill, 2008.
- Introduction to Algorithms, third edition, by Cormen, Leiserson, Rivest, and Stein, MIT Press, 2009.

A limited number of copies of Cormen et al. are available for electronic viewing through the University of Manitoba Library website.

Assignments. Assignments will consist of weekly problem sets, seeking constructive solutions to problems related to lecture material and assigned reading. Solutions should include sufficiently detailed descriptions, presented clearly and unambiguously, and showing steps. Students will have one week to complete each assignment individually. Solutions must be submitted by the start of class on the due date (Thursday). To permit the prompt distribution of solutions and return of marked assignments, **late assignments will not be accepted**.

Each students must include his/her name, student number, and email address at the top of the first page on all submitted material, as well as the names of people with whom he/she discussed the assignment solution. Each student must cite any sources to which the submitted solution refers, as should be done when presenting any scientific document. Solutions must be submitted electronically using UMLearn. Only pdf files will be accepted.

For each assignment, only a subset of the questions will be graded (i.e., some questions will be assigned 0 marks).

Examinations. There will be two midterm exams held in class, and a final exam held during the exam period. Exams will be closed book.

Grading. Grades will be calculated according to the following table:

assignments	10%
midterm exams	40%
final exam	50%

Grades will be allocated according to the following breakdown:

A+	≥ 90	
A	≥ 80	< 90
B+	≥ 75	< 80
B	≥ 70	< 75
C+	≥ 65	< 70
C	≥ 60	< 65
D	≥ 50	< 60
F		< 50

Important Dates.

January 4	first class	March 16	last day for withdrawal
February 15	midterm exam	April 5	last class
February 19–23	midterm break - no class	April 9–23	exam period
March 15	midterm exam		

Academic Integrity. The Faculty of Science takes academic integrity very seriously. Any evidence of academic dishonesty on assignments, labs and/or tests will be forwarded to the appropriate authorities for potential disciplinary actions.
The University Student Discipline By-Law may be accessed at: `http://umanitoba.ca/admin/governance/governing_documents/students/student_discipline.html`.

Information from the Faculty of Science regarding Cheating and Plagiarism can be found at http://umanitoba.ca/faculties/science/undergrad/resources/webdisciplinedocuments.html.
Students are encouraged to discuss course concepts and the general interpretation of homework problems with other students in the class. No written record should be taken from such discussion. Each student must work on the final solution of assignment problems independently. On a cover page, each student must list the names of people with whom he or she has discussed the assignment solution. Following conventions for citing reference materials in scientific writing is mandatory. Submitting the work of another person as your own constitutes academic misconduct. Any course work that does not follow these guidelines will be considered plagiarism and will be reported to the Faculty of Science. Students are to abide by the university's policies regarding academic dishonesty which can be found on this web site: http://umanitoba.ca/student/resource/student_advocacy/academicintegrity/students/

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Course Technology. It is the general University of Manitoba policy that all technology resources are to be used in a responsible, efficient, ethical and legal manner. The student can use all technology in classroom setting only for educational purposes approved by instructor and/or the University of Manitoba Student Accessibility Services. Student should not participate in personal direct electronic messaging / posting activities (e-mail, texting, video or voice chat, wikis, blogs, social networking (e.g. Facebook) online and offline gaming during scheduled class time. If student is on call (emergency) the student should switch his/her cell phone on vibrate mode and leave the classroom before using it. (Copyright S. Kondrashov. Used with permission)

Class Communication. The University requires all students to activate an official University email account. For full details of the Electronic Communication with Students please visit: http://umanitoba.ca/admin/governance/governing_documents/community/electronic_communication_with_students_policy.html
Please note that all communication between myself and you as a student must comply with the electronic communication with student policy. You are required to obtain and use

your University of Manitoba email account for all communication between yourself and the university.

Student Accessibility Services. If you are a student with a disability, please contact SAS for academic accommodation supports and services such as note-taking, interpreting, assistive technology and exam accommodations. Students who have, or think they may have, a disability (e.g. mental illness, learning, medical, hearing, injury-related, visual) are invited to contact SAS to arrange a confidential consultation. Student Accessibility Services
`http://umanitoba.ca/student/saa/accessibility/`
520 University Centre
204 474 7423
`mailto:Student_accessibility@umanitoba.ca`

Academic Recourses. Various academic resources are available to students including the Science and Technology Library and various departmental help centers.

Health & Mental Health Resources. Students with Health and/or Mental Health issues may seek advice and/or help from Student Counselling Center, Student Accessibility Services, and University Health Services.

Respectful Behaviour Resources. Students are expected to act in a respectful manner. Policies regarding respectful work and learning environment and sexual assault can be found at `http://umanitoba.ca/admin/governance/governing_documents/community/230.html`.

Final Examinations, Grades and Grade Appeals Resources. Final examination and grades policies can be found at `http://umanitoba.ca/admin/governance/governing_documents/academic/1299.html`.
Students wishing to appeal their term work grade can do so through the Registrars office. A fee is charged for each appeal.
To view your final examination, please check with the department offering the course for policies.
To appeal your final grade, you can initiate the process at the Registrars office. A fee will be charged for each appeal. See the Registrars office for more information.

Limited Access and VW Resources. Students who fail or VW from a course will be subject to limited access to that course in future terms. That is, students will not be able to register for a course (for which they have VWed or failed) during the limited access registration period. For more information, please see the policy document for repeated courses at `http://www.umanitoba.ca/admin/governance/media/Repeated_Course_Policy_-_2016_09_01.pdf`.