

## Course Information

Instructor: Steph Durocher

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Web: [www.cs.umanitoba.ca/~comp3170](http://www.cs.umanitoba.ca/~comp3170)

Lectures: 10:30–11:20 am Monday, Wednesday, and Friday in EITC E2-130

Office hours: 9:30–10:20 am Monday and 10:30–11:30 am Tuesday

**Prerequisites.** Analysis of Algorithms (COMP 2080) and Data Structures and Algorithms (COMP 2140). Students are expected to be familiar with intermediate topics in design and analysis of algorithms, data structures, and discrete mathematics (including sorting, searching, big Oh notation, trees, and hash tables) and introductory concepts in logic, set theory, algebra, calculus, and graph theory.

**Course Description.** COMP 3170 is a course on analysis of data structures and algorithms. Students will learn new techniques for solving fundamental algorithmic problems efficiently.

Possible topics to be covered include:

- selection
- balanced search trees
- skip lists
- amortized analysis
- computational complexity
- approximation algorithms
- lower bounds
- mergeable heaps
- graph algorithms
- randomized algorithms
- string matching

**Textbook.** The following book is required and is available at the University of Manitoba bookstore:

- Introduction to Algorithms, third edition, by Cormen, Leiserson, Rivest, and Stein, MIT Press, 2009.

The following books are useful references available on reserve at the Sciences and Technology Library:

- Algorithms and Data Structures, by Mehlhorn and Sanders, Springer, 2008.
- The Algorithm Design Manual, second edition, by Skiena, Springer, 2008.
- Advanced Data Structures, by Brass, Cambridge, 2008.

Most Springer publications are available online at SpringerLink through the University of Manitoba Library.

**Grading.** All students will be required to complete six assignments, two quizzes, a midterm exam, and a final exam. The number of assignments and quizzes may be decreased at the discretion of the instructor. Grades will be calculated according to the following table:

assignments	30%
quizzes	10%
midterm exam	20%
final exam	40%

**Assignments.** Assignments will be distributed in class during the term. Solutions must be submitted on Desire2Learn (UMLearn) by the start of class on the due date. To permit the prompt distribution of solutions and return of marked assignments, **late assignments will not be accepted.** Please include your name and student number on all submitted material.

**Examinations.** Two quizzes will be given in class. There will be a midterm exam held in class and a final exam held during the April exam period. Exams and quizzes will be closed book.

**Important Dates.**

January 6	first class	March 18	last day for withdrawal
January 27	assignment 1 due	March 23	assignment 5 due
February 3	quiz	March 25	Good Friday - no class
February 10	assignment 2 due	March 28–29	office hours cancelled
February 15–19	midterm break - no class	March 30	quiz
February 24	assignment 3 due	April 6	assignment 6 due
March 2	midterm exam	April 8	last class
March 9	assignment 4 due	April 11–25	exam period

**Academic Integrity.** 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 discussions. 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. Submitting the work of another person as your own constitutes academic misconduct. Any collaboration 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/](http://umanitoba.ca/student/resource/student_advocacy/academicintegrity/students/)