Brock University
Department of Computer Science

COSC 2P03 – Advanced Data Structures
Fall 2019

Instructor:

Sheridan Houghten, J313

Prerequisites:

COSC 1P03 (minimum 60%); MATH 1P66 and 1P67.

Course Description:

This course emphasizes the definition, usage and manipulation of dynamic data structures and their associated algorithms.

Textbook:

Data Structures and Algorithm Analysis in Java 3rd edition, Mark Allen Weiss, Addison-Wesley, ISBN: 0-13-257627-9 / 978-0-13-257627-7.

Library Reserves:

All editions of the textbook will be placed on reserve at the library, along with these additional references:

- Classic Data Structures in Java, Timothy Budd.
- Data Structures & Algorithms in Java, Robert Lafore.
- Algorithms in Java, Robert Sedgewick.
- Data Structures & Problem Solving Using Java, Mark Allen Weiss.

Mark Distribution:

Assignments (4): 30%
Midterm Test: 25%
Final Exam: 45%

Tentative Outline:

Note that additional reading may be required.

- Introduction: objectives of the course and a brief review of related material, including, but not limited to: Recursion (ch.1), Complexity (ch.2).
- Stacks and Queues – review (ch.3) and Priority Queues (ch.6)
- Trees (ch.4)
- Heaps (ch.6)
- Advanced Sorting (ch.7)
- Hashing (ch.5)
- Graphs (ch.9)
- Optional Topics: including, but not limited to: Algorithm Design Techniques (ch.10), Advanced Data Structures (ch.12).

Important Dates:

- Last date for withdrawal without academic penalty: Tuesday 5th November, 2019.
- Last date to receive notification of at least 15% of final grade: Tuesday 29th October, 2019.
- Expected assignment due dates: 20th September, 4th October, 8th November, 29th November.
- Expected midterm date: Thursday, 24th October.

Course Policies:

Illness: If you miss a test or assignment due to illness, you must submit a student medical certificate (`http://www.cosc.brocku.ca/forms/medical`) *within 3 days of the illness*, at the main office in the Computer Science department.

Plagiarism: The department views plagiarism as a serious issue. Students may visit `http://www.cosc.brocku.ca/about/policies/plagiarism` to view the department's policies on plagiarism. Plagiarism detection software will be used in this course.

Assignments: To pass this course, you must obtain a total assignment mark of at least 40% (i.e. when considering the assignments as a group, not for each individual assignment).

Final Exam: To pass this course, you must obtain a mark of at least 40% on the final exam.

Midterm Test: The midterm test will be given during **class** time, on a preannounced date.

Assignments:

- All assignments must be completed *individually*.
- Due dates for assignments will be printed on the assignment text. Assignments will be accepted up to 3 days late with a one-time penalty of 25%. Generally it is to your advantage to hand in assignments on time, even if incomplete. You are strongly encouraged to hand all assignments in on time.
- Assignments are to be submitted electronically using Sakai.
- Assignments must be written in Java using `DrJava` or `IntelliJ`. These resources are available in the COSC labs.

Additional notes:

- Questions and discussion are encouraged in class.
- Assignments for this course are expected to take significantly more time to complete than assignments for first-year courses. Assignments will vary in weight; the weight will be given on the assignment text. Assignments carrying a higher weight are naturally expected to require more time to complete.
- Tutorials are expected to take place every other week, starting in the second week. Students will be informed in class and on the course website of the exact schedule.
- There are no scheduled labs for this course. For assistance with assignments in particular, students should go to the COSC help desk in J328 during the scheduled times, shown here: `http://www.cosc.brocku.ca/help`.