

**Instructor:** Earl Foxwell

This course teaches how to create and use advanced data structures, and associated algorithms, with the focus on Java. Key topics include complexity, recursion, trees, hashes, stacks and queues.

### **Course Materials:**

**Textbook:** Data Structures & Algorithm Analysis in Java 3<sup>rd</sup> Edition – Mark Allen Weiss

### **Evaluation:**

Assignments (4):	40%
Midterm:	20%
A.I. Quiz:	1%
Final Exam:	39%

Note: A final grade of at least 40% is required for the final exam in order to receive credit for the course. A valid mark on the midterm is required to receive credit.

A 100% on the Academic Integrity Quiz is required to receive credit for the course.

- Failure to complete the AI quiz in time will result in Sakai access being disabled

### **Subject Overview:**

- Introduction to the course. Complexity (ch. 2). Recursion (ch. 1).
- Review of Stacks and Queues (ch. 3). Priority Queues introduced (ch. 6).
- Trees (ch. 4).
- Heaps (ch. 6) and return to Priority Queues.
- Advanced Sorting (ch. 7).
- Hashing (ch. 5).
- Graphs (ch. 9).
- Algorithm Design Techniques (ch. 10), Advanced Data Structures (ch. 12).

### **Additional Notes:**

- All official correspondence is done via email; schedules will also be posted via announcement/email.
  - You are assumed to have read anything sent to your Brock email account
  - We can only reply to messages sent from your Brock email account
  - You must include **COSC2P03** in the **subject** line of any email you send
- Lectures and tutorials (once started) are mandatory. Missing announcements, evaluation, or submissions due to having skipped scheduled in-class time will not be accommodated.
- All submission will be done through Sakai; refer to assignment specifications for details
- All assignments will include a due date; this due date is the date by which the submission is due. Late assignments will not be accepted.
  - **Do not try emailing assignments to your instructor.**
- Please read the department's policy on medical notes on the COSC home page. Other reasons may be used for granting extensions or other accommodations, at the instructor's discretion, but only if the instructor is contacted *in advance* of assignment due dates.
- If the markers can't readily compile and execute your code, you will receive a zero.
- Electronic submission will be required, and solutions may be run through MOSS to test for plagiarism. Plagiarism is a serious offense and will be treated accordingly. See

<http://www.cosc.brocku.ca/about/policies/plagiarism> for details.

- The midterm and exam are in-person
  - The former will be conducted during Tutorial; the latter is scheduled by the registrar's office
- As part of Brock University's commitment to a respectful work and learning environment, the university will make every reasonable effort to accommodate all members of the university community with disabilities. If you require academic accommodations related to a permanent disability to participate in this course, you are encouraged to contact the Student Development Centre Services for Students with Disabilities (4th Floor Schmon Tower ext. 3240) **and also to discuss these accommodations with the instructor.**
- Plagiarism is a serious offense and will be treated accordingly. See <http://www.cosc.brocku.ca/about/policies/plagiarism> for details.
  - Please note that distribution of course material outside of Brock University is prohibited, and may constitute both academic *and* non-academic misconduct.
    - Additionally, uploading of any Brock materials will result in having Sakai access immediately revoked, as an abuse of computing privileges.
  - Assignments will be carefully examined regarding plagiarism. Phrase-matching software will be used to electronically compare assignments for the purpose of detection and prevention
  - In the event of a misconduct hearing, other grading weight will be shifted onto 'confirmed deliverables': e.g. the exam
- Assignments must conform to standards and procedures as detailed in lecture and instructions. Requests may be made to have anomalies explained, in which case failure to respond will result in a zero for that assessment. Overtly ignoring requirements will similarly result in a zero.
  - To confirm: AI-powered tools are not permitted
  - If someone else's name is in your submission, possible explanations will be assumed to be that it isn't your submission (0%), or that it's misconduct. So don't allow that scenario to occur, k?
  - If markers can't readily grade your submissions, they will receive a zero
- June 16<sup>th</sup> is the last day for voluntary withdrawal without academic penalty. 15% of the final grade will be available by June 9<sup>th</sup>.

Tentative Schedule (very subject to change!):

Week 1: Introduction, data abstraction, refresher

Week 2: Complexity revisited, recursion, etc.

Week 3: Trees, properties, traversals

Week 4: Binary search trees, threading, and height-balancing

Week 5: Heaps

Week 6: B+Trees

Week 7: Sorting

Week 8: Graph representations, graph traversals, biconnectivity and articulation points

Week 9: Minimal Spanning Trees, topological sorts, shortest path algorithms

Week 10: Hash tables, extendible hash tables

Note: Content has been generously provided by Dr. Sheridan Houghten and Dave Bockus.