

## Course Outline for COMP2402B (Fall 2015)

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### Abstract Data Types / Algorithms

*Introduction to the design and implementation of abstract data types and to complexity analysis of data structures. Topics include: stacks, queues, lists, trees and graphs. Special attention is given to abstraction, interface specification and hierarchical design using an object-oriented programming language.*

#### Course Information

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**Instructor Name**  
**Contact Information**

**Robert Collier**  
[robert.collier@scs.carleton.ca](mailto:robert.collier@scs.carleton.ca)

**Lecture Hours**  
Tuesdays and Thursdays  
08:35 – 09:55  
Steacie Building, Room 103

**Office Hours**  
Tuesdays and Thursdays  
13:30 – 15:00  
Herzberg Laboratories, Room 5326

**Course Website**  
<https://www.carleton.ca/culearn/>

**Course Forum**  
<https://www.carleton.ca/culearn/>

#### Required Textbook

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There is one (1) **required** textbook for this course:

**Morin, P. (2013). Open Data Structures (in Java).**

This textbook is freely available online at <http://opendatastructures.org>. Paperback editions are also available and can be purchased from the bookstore or online.

#### Assessment Scheme

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Your performance in this course is assessed using several components. These include a collection of **five (5) assignments** (beginning the week of September 7<sup>th</sup>), **one (1) midterm examination (tentatively scheduled for Friday, October 16<sup>th</sup> from 19:00-20:30)**, and a **final examination** (to be scheduled by the registrar). The grades you achieve on these components will be weighted according to the following scheme, but **in order to pass the course you must receive a passing grade (at least 50%) for the weighted average of the midterm and final examinations.**

Assignments (5 × 10% each)	50%
Midterm Examination	20%
Final Examination	30%

If your weighted assignment, midterm, and final examination marks are denoted A, M, and F, respectively, then **your final grade G can be determined using the following algorithm:**

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if (M + F ≥ 25%)  
    G = minimum(A+M+F, 100%)  
else  
    G = minimum(A+M+F, 2 × (M+F))
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## Learning Outcomes

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If a student attends every lecture and completes every assignment, then by the end of this course that student should be able to:

- Use the **Java Collections Framework**
- **Describe** the **different types of sequences** (i.e., lists, stacks, queues, and dequeues)
- **Describe performance considerations** for different abstract data type implementations
- **Implement** the different abstract data types **using both arrays and linked-lists**
- **Explain** the following topics:
  - **unordered sets, hash tables**
  - **ordered sets, balanced binary search trees, skiplists**
  - **priority queues, heaps**
  - **sorting algorithms**

## Prerequisite Courses

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**One of COMP 1406, COMP 1006, SYSC 2004, with a minimum grade of C-.** Credit in this course precludes additional credit for COMP 2002 (no longer offered), SYSC 2002 (no longer offered), and SYSC 2100. **Students who are granted equivalencies or transfer credits** in lieu of the prerequisite course(s) **are responsible for ensuring that they are comfortable with all prerequisite course content.**

## Undergraduate Academic Advisor

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The Undergraduate Advisor for the School of Computer Science is available in Room 5302C HP, by telephone at 520-2600, ext. 4364 or by email at [undergraduate\\_advisor@scs.carleton.ca](mailto:undergraduate_advisor@scs.carleton.ca). The undergraduate advisor can assist with information about prerequisites and preclusions, course substitutions or equivalencies, understanding your academic audit and the remaining requirements for graduation. The undergraduate advisor will also refer students to appropriate resources such as the Science Student Success Centre, Learning Support Services and the Writing Tutorial Services.

## Additional Notes

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**Including** the time spent **attending lectures**, students can expect to spend **at least ten (10) hours per week** on this course. **Students are responsible for all course materials.** This includes **lecture notes, readings from the textbook, extra problem sets** (if given), and **all materials discussed in class** and on any of the **official discussion boards.**

**Questions pertaining to the marking of assignments should be sent to the teaching assistant(s)** that completed the marking, and unless the student wishes to share information of a personal or confidential nature, **all questions should be asked on the official forums and not via email.**

**All materials created for this course** (including, but not limited to, lecture notes, in-class examples, tutorial exercises, assignments, examinations, and posted solutions) **remain the intellectual property of the instructor.** These materials are intended for the personal and non-transferable use of students registered in the current offering of the course. **Posting, reproducing, or redistributing any course materials**, in part or in whole, without the written consent of the instructor, **is strictly prohibited.**

## Plagiarism Policy

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Everything you submit for marks in this course (including assignments, exercises, etc.) **must be the result of your own work** and it must have been **developed specifically for this offering of this course**. To clarify, this means that **if you have taken this course before (in a previous semester), you may not submit any of the work you did** for that previous offering, even if it is your own.

**Posting assignment solutions on discussion boards before the due date and time is strictly prohibited**, and all assignment questions must be posted on **the official cuLearn discussion board**.

Everything you submit for marks in this course **must not reflect the efforts of anyone else unless you explicitly document the source**. In practice this means that you must provide a citation for everything you use in the development of your assignments and exercises, including (but not limited to) materials from the course textbook, discussions with your classmates, teaching assistants or tutors, and anything you find online. For submissions of programs, source code, and pseudocode, you must **provide a citation for any block of code that is at least three simple statements in length**, regardless of whether or not you modified it.

To ensure that this directive is followed, **every submission you make must include the following citation**:

Collier, R. "Lectures Notes for COMP2402B - Abstract Data Types / Algorithms" [PDF document]. Retrieved from cuLearn: <https://www.carleton.ca/culearn/> (Fall 2015).

To cite a textbook, use the following format: ***Last Name, First Initial. (Year of Publication). Title (pp. Pages).***  
e.g., Morin, P. (2013). Open Data Structures (in Java). (pp. 1-334).

To cite a website, use the following format: ***Webpage Title. (Access Date). Retrieved from URL.***  
e.g., Open Data Structures. (2015-09-01). Retrieved from <http://opendatastructures.org/>.

To cite a discussion, use the following format: ***Last Name, First Initial. (Personal Communication, Date).***  
e.g., Collier, R. (Personal Communication, 2015-09-01).

Please also note that **providing citations for the sources you use** that are not your own may prevent charges of academic misconduct but it **does not allow you to receive credit for work you did not create**. To clarify, if you submit a program that includes a large block of source code from a program you didn't write for this offering of the course, then even if you provide a citation **you will not receive any marks for that component**.

You are free to discuss general approaches with your friends and classmates, but you are **never permitted to access the flowcharts, design documents, pseudocode, or source code of another student**. You should never receive any materials, written or electronic, from another student, and if you do meet with friends or classmates to discuss approaches you are not permitted to leave those discussions with any written or electronic material.

It is also a serious offense to help someone else commit plagiarism. You are **never permitted to provide another student access to the flowcharts, design documents, pseudocode, or source code that you or anyone else has written**. If you suspect that someone has been able to acquire a copy of your work, then you must inform the instructor for the course immediately. Please also note that **electronic tools may be used to analyze and compare submissions** to ensure that no instances of academic misconduct have been committed.

### **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 refer to the course outline statement or the instructor concerning this issue.

### **Academic Accommodations for Students with Disabilities**

The Paul Menton Centre for Students with Disabilities (PMC) provides services to students with Learning Disabilities (LD), psychiatric/mental health disabilities, Attention Deficit Hyperactivity Disorder (ADHD), Autism Spectrum Disorders (ASD), chronic medical conditions, and impairments in mobility, hearing, and vision. If you have a disability requiring academic accommodations in this course, please contact PMC at 613-520-6608 or [pmc@carleton.ca](mailto:pmc@carleton.ca) for a formal evaluation. If you are already registered with the PMC, contact your PMC coordinator to send me your Letter of Accommodation at the beginning of the term, and 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 me to ensure accommodation arrangements are made. Please consult the PMC website for the deadline to request accommodations for the formally-scheduled exam (if applicable) at <http://www2.carleton.ca/pmc/new-and-current-students/dates-and-deadlines>

### **Religious Obligation**

Write to me 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: <http://www2.carleton.ca/equity/>

### **Pregnancy Obligation**

Write to me 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: <http://www2.carleton.ca/equity/>

### **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 <http://www.carleton.ca/registrar/form>

**You must also read:** <http://calendar.carleton.ca/undergrad/regulations/academicregulationsoftheuniversity/>