COMP 2140: Data Structures and Algorithms

Fall 2014

Calendar Description: Introduction to the representation and manipulation of data structures. Topics will include lists, stacks, queues, trees, and graphs.

Sections and Instructors:
Section A01 (CRN 10181), Tuesday and Thursday 2:30–3:45 p.m. in E2 110 EITC:
Instructor name: Stephane Durocher
Office: E2 412 EITC
Phone: 474-8674 (voicemail)
Email: durocher@cs.umanitoba.ca

Section A02 (CRN 13589), Monday, Wednesday and Friday 1:30–2:20 p.m. in E2 105 EITC:
Instructor name: Helen Cameron
Office: E2 477 EITC
Phone: 474-8466 (voicemail)
Email: Helen.Cameron@cs.umanitoba.ca

Emailing your professor: To ensure we see your email,
• Put “[comp2140]” in the subject and use a meaningful subject.
• Send from your UofM email account.

Office Hours:
Stephane Durocher (E2 412 EITC): Tuesday and Wednesday 3:45–4:30 p.m. or by appointment.
Helen Cameron (E2 477 EITC): Mon/Wed/Fri at 10:30–11:30 a.m. and 2:30–3:30 p.m. or by appointment.

Website: [Desire2Learn (D2L)] is used in this course; please make sure you can access COMP2140 in D2L.

Prerequisite: COMP 1020 Minimum Grade of C or COMP 1020 - PQ Substitution 060 or COMP 1021 Minimum Grade of C.

Are you entitled to be registered? It is your responsibility to ensure that you are entitled to be registered in this course. To be eligible to be registered, you must:

• Have the appropriate prerequisites, as noted in the calendar description, or have permission from the instructor to waive these prerequisites; and
• Have not previously taken, or are concurrently registered in, this course and another that has been identified as “not to be held with” in the course description. For example, BIOL 1000 cannot be held for credit with BIOL 1020.

The registration system may have allowed you to register in this course, but it is your responsibility to check. If you are not entitled to be in this course, you will be withdrawn, or the course may not be used in your degree program. There will be no fee adjustment. These consequences are not appealable. Please be sure to read the course description for this and every course in which you are registered.

Computer Science registration issues? Talk to Dr. Michael Domaratzki (E2 414 EITC, mdomarat@cs.umanitoba.ca).
**Course Text:** No text book is required and we will not follow any particular book. We recommend that you have access to a recent textbook on data structures and algorithms. Here are a few options (but any recent text should do):


**Assignments:** There will be approximately five assignments (approximately every two weeks), most involving the design and implementation of programs requiring the use of data structures and common algorithms performed on data structures. Programming is done in Java and may be done on whatever platform you wish. Assignments must be done individually. You must follow the course programming standards (available on the course website).

**Late assignments will not be accepted.** Please be aware that the Faculty of Science policy on unclaimed assignments states that assignments will be retained for four months after the end of term. After that date, the assignments become property of the faculty member and will be destroyed.

**Labs:** There is also a scheduled laboratory component to this course, and attendance at laboratories is compulsory. There will be five labs. The first labs will be during the week of Monday September 22 and there will be a lab every two weeks (consult the class schedule on aurora).

**Midterm:** In addition to assignments and labs, a 50-minute closed-book midterm test will be given during normal class time on Thursday October 30 in Section A01 and Friday October 31 in Section A02. There are no alternate dates for this midterm. Students must write the midterm in the section in which they are officially registered.

**Final Exam:** A final examination will be given during the examination period (December 8–19). You must remain available during the examination period until all your examination obligations have been fulfilled.

**Evaluation:**

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<thead>
<tr>
<th>Category</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Assignments</td>
<td>15%</td>
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<tr>
<td>Labs</td>
<td>10%</td>
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<tr>
<td>Midterm Test</td>
<td>25%</td>
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<tr>
<td>Final Examination</td>
<td>50%</td>
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At least one assignment and the midterm will be marked and returned to you by the voluntary withdrawal deadline (Wednesday November 12).

**Academic Dishonesty:** Students are reminded that there are penalties for academic dishonesty. Academic dishonesty includes submitting assignments that are not entirely the student’s own work. See [the Faculty of Science’s policy on Academic Dishonesty](http://www.cs.umanitoba.ca/~hacamero/comp2140/HonestyDeclarationCOMP2140Fall2014.pdf), to which you are bound, for complete details. You should also read the university course calendar on Academic Integrity and on exam regulations, including personation. A blanket honest declaration sheet, which states that all work being submitted for this course is completely your own, is available on D2L and at [http://www.cs.umanitoba.ca/~hacamero/comp2140/HonestyDeclarationCOMP2140Fall2014.pdf](http://www.cs.umanitoba.ca/~hacamero/comp2140/HonestyDeclarationCOMP2140Fall2014.pdf).

This honesty declaration must be printed out, filled in, signed, and submitted to your instructor by 4:30 p.m. on Thursday September 18. No assignment will be marked unless a completed declaration has been received from you. Note that you hand in only ONE copy of this declaration, which covers ALL your work in the course.
Important Dates:

<table>
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<tr>
<th>Date</th>
<th>Event</th>
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<tbody>
<tr>
<td>Thursday September 4</td>
<td>First day of classes</td>
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<tr>
<td>Thursday September 18</td>
<td>Last day to hand in honesty declaration</td>
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<tr>
<td>Monday September 22</td>
<td>First week of labs</td>
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<tr>
<td>Monday October 13</td>
<td>Thanksgiving Day, no classes</td>
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<tr>
<td>Thursday October 30</td>
<td>Section A01 midterm (in class)</td>
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<tr>
<td>Friday October 31</td>
<td>Section A02 midterm (in class)</td>
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<td>Tuesday November 11</td>
<td>Remembrance Day, no classes</td>
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<td>Wednesday November 12</td>
<td>Voluntary Withdrawal Deadline</td>
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<tr>
<td>Wednesday December 3</td>
<td>Last day of classes</td>
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<tr>
<td>Monday December 8–Friday December 19</td>
<td>Final exam period</td>
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Course Topics: Course topics are intended to include the following (some subtopics may be omitted if time runs short, and this list does not necessarily reflect the order in which material may be covered):

- Sorting and Recursion: Writing recursive code; merge sort, quick sort, and radix sort.
- Abstract Data Types: Design philosophy of ADTs; specific ADTs and their implementations.
- Linked Lists: Pointers and pointer manipulation; linked list basic operations; linked list variations (dummy nodes, doubly-linked lists); sparse matrices.
- Stacks and Queues: Stacks; bracket matching; postfix, prefix, infix expressions; evaluating postfix; queues.
- Tables and Hashing: The Table ADT; hash tables and hashing algorithms; collision resolution: separate chaining (if time permits: linear probing, double hashing)
- Trees: Binary search trees; 2-3 trees
- Heaps (if time permits): ADT Priority Queue; heaps; heap sort.
- Graphs: Representation; traversals; paths.