1. **Course:** CPSC 319, Data Structures, Algorithms, and Their Applications - Winter 2024

Lecture 01: MWF 13:00 - 13:50 in ST 131

<table>
<thead>
<tr>
<th>Instructor</th>
<th>Email</th>
<th>Phone</th>
<th>Office</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr Mario Costa Sousa</td>
<td><a href="mailto:smcosta@ucalgary.ca">smcosta@ucalgary.ca</a></td>
<td>403 220-6783</td>
<td>MS 628</td>
<td>Monday and Wednesday, 2:30 pm - 3:30 pm</td>
</tr>
</tbody>
</table>

To account for any necessary transition to remote learning for the current semester, courses with in-person lectures, labs, or tutorials may be shifted to remote delivery for a certain period of time. In addition, adjustments may be made to the modality and format of assessments and deadlines, as well as to other course components and/or requirements, so that all coursework tasks are in line with the necessary and evolving health precautions for all involved (students and staff).

**In Person Delivery Details:**

Regular lectures, tutorials, midterm (parts 1 and 2) and final exam.

**Course Site:**

D2L: CPSC 319 L01-(Winter 2024)-Data Structures, Algorithms, and Their Applications

https://d2l.ucalgary.ca/d2l/home/569167

**Note:** Students must use their U of C account for all course correspondence.

**Equity Diversity & Inclusion:**

The University of Calgary is committed to creating an equitable, diverse and inclusive campus, and condemns harm and discrimination of any form. We value all persons regardless of their race, gender, ethnicity, age, LGBTQIA2S+ identity and expression, disability, religion, spirituality, and socioeconomic status. The Faculty of Science strives to extend these values in every aspect of our courses, research, and teachings to better promote academic excellence and foster belonging for all.

2. **Requisites:**

See section 3.5.C in the Faculty of Science section of the online Calendar.

**Prerequisite(s):**

3 units from Computer Science 219, 233, 235, Computer Engineering 335, 339 or Software Engineering for Engineers 337.

**Antirequisite(s):**

Credit for Computer Science 319 and 331 will not be allowed. Computer Science majors are not permitted to register in this course.

3. **Grading:**

The University policy on grading and related matters is described in F.1 and F.2 of the online University Calendar.

In determining the overall grade in the course the following weights will be used:
<table>
<thead>
<tr>
<th>Course Component</th>
<th>Weight</th>
<th>Due Date (duration for exams)</th>
<th>Modality for exams</th>
<th>Location for exams</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assignment 1 - Comparing Algorithms ¹</td>
<td>6%</td>
<td>Jan 26 2024</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assignment 2 - Sorting &amp; Searching²</td>
<td>7%</td>
<td>Feb 15 2024</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Midterm 1</td>
<td>20%</td>
<td>Mar 01 2024 at 01:00 pm (50 Minutes)</td>
<td>in-person</td>
<td>TBD</td>
</tr>
<tr>
<td>Assignment 3 - Binary Search Trees³</td>
<td>8%</td>
<td>Mar 08 2024</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assignment 4 - Graphs⁴</td>
<td>9%</td>
<td>Apr 02 2024</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Midterm 2</td>
<td>10%</td>
<td>Apr 03 2024 at 01:00 pm (50 Minutes)</td>
<td>in-person</td>
<td>TBD</td>
</tr>
<tr>
<td>Registrar Scheduled Final Exam</td>
<td>40%</td>
<td>Will be available when the final exam schedule is released by the Registrar</td>
<td>in person</td>
<td>Will be available when the final exam schedule is released by the Registrar</td>
</tr>
</tbody>
</table>

¹ D2L Dropbox @ 11:59pm MST  
² D2L Dropbox @ 11:59pm MST  
³ D2L Dropbox @ 11:59pm MST  
⁴ D2L Dropbox @ 11:59pm MST

Each piece of work (reports, assignments, quizzes, midterm exam(s) or final examination) submitted by the student will be assigned a grade. The student's grade for each component listed above will be combined with the indicated weights to produce an overall percentage for the course, which will be used to determine the course letter grade.

The conversion between a percentage grade and letter grade is as follows.

<table>
<thead>
<tr>
<th>Minimum % Required</th>
<th>A+</th>
<th>A</th>
<th>A-</th>
<th>B+</th>
<th>B</th>
<th>B-</th>
<th>C+</th>
<th>C</th>
<th>C-</th>
<th>D+</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>97</td>
<td>93</td>
<td>90</td>
<td>87</td>
<td>83</td>
<td>80</td>
<td>77</td>
<td>73</td>
<td>70</td>
<td>67</td>
<td>65</td>
</tr>
</tbody>
</table>

I am using UCalgary's Undergraduate Grading System: https://www.ucalgary.ca/pubs/calendar/current/f-1-1.html

This course will have a Registrar Scheduled Final exam that will be delivered in-person and on campus. The Final Examination Schedule will be published by the Registrar's Office approximately one month after the start of the term. The final exam for this course will be designed to be completed within 2 hours.

The University of Calgary offers a flexible grade option, Credit Granted (CG) to support student's breadth of learning and student wellness. Faculty units may have additional requirements or restrictions for the use of the CG grade at the faculty, degree or program level. To see the full list of Faculty of Science courses where CG is not eligible, please visit the following website: https://science.ucalgary.ca/current-students/undergraduate/program-advising/flexible-grading-option-cg-grade

4. Missed Components Of Term Work:

In the event that a student legitimately fails to submit any online or in-person assessment on time (e.g. due to illness, domestic affliction, etc...), please contact the course coordinator, or the course instructor if this course does not have a coordinator to arrange for a re-adjustment of a submission date, or possible exemption and reweighing of components. Absences not reported within 48 hours will not be accommodated. Students may be asked to provide supporting documentation (Section M.1) for an excused absence, See FAQ.

If an excused absence is approved, options for how the missed assessment is dealt with is at the discretion of the coordinator or course instructor. Some options such as an exemption and pro-rating among the components of the course may not be a viable option based on the design of this course.

5. Scheduled Out-of-Class Activities:

The following out of class activities are scheduled for this course.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Location</th>
<th>Date and Time</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Midterm 1</td>
<td>TBD</td>
<td>Friday, March 1, 2024 at 1:00 pm</td>
<td>50 Minutes</td>
</tr>
<tr>
<td>Midterm 2</td>
<td>TBD</td>
<td>Wednesday, April 3, 2024 at 1:00 pm</td>
<td>50 Minutes</td>
</tr>
</tbody>
</table>

REGULARLY SCHEDULED CLASSES HAVE PRECEDENCE OVER ANY OUT-OF-CLASS-TIME-ACTIVITY. If you have a conflict with the out-of-class-time-activity, please contact your course coordinator/instructor no later than 14 days prior to the date of the out-of-class activity so that alternative arrangements may be made.
6. **Course Materials:**

   Required Textbook(s):


   **Online-slides and reading materials**

   In order to successfully engage in their learning experiences at the University of Calgary, students taking online, remote and blended courses are required to have reliable access to the following technology:

   - A computer with a supported operating system, as well as the latest security, and malware updates;
   - A current and updated web browser;
   - Webcam/Camera (built-in or external);
   - Microphone and speaker (built-in or external), or headset with microphone;
   - Current antivirus and/or firewall software enabled;
   - Stable internet connection.

   For more information please refer to the UofC [ELearning](#) online website.

7. **Examination Policy:**

   No aids (including electronic) are allowed on tests or examinations. Bring 2B pencils, blue pens, a pencil pointer, and an eraser. You can also bring a "Cheat Sheet" (Allowed Reference Sheet) as a letter-size page written in the front/back.

   Students should also read the Calendar, [Section G](#), on Examinations.

8. **Approved Mandatory And Optional Course Supplemental Fees:**

   There are no mandatory or optional course supplemental fees for this course.

9. **Writing Across The Curriculum Statement:**

   For all components of the course, in any written work, the quality of the student's writing (language, spelling, grammar, presentation etc.) can be a factor in the evaluation of the work. See also [Section E.2](#) of the University Calendar.

10. **Human Studies Statement:**

    Students will not participate as subjects or researchers in human studies.

    See also [Section E.5](#) of the University Calendar.

11. **Reappraisal Of Grades:**

    A student wishing a reappraisal, should first attempt to review the graded work with the Course coordinator/instructor or department offering the course. Students with sufficient academic grounds may request a reappraisal. **Non-academic grounds are not relevant for grade reappraisals.** Students should be aware that the grade being reappraised may be raised, lowered or remain the same. See [Section I.3](#) of the University Calendar.

    a. **Term Work:** The student should present their rationale as effectively and as fully as possible to the Course coordinator/instructor within **ten business days** of either being notified about the mark, or of the item’s return to the class. If the student is not satisfied with the outcome, the student shall submit the Reappraisal of Graded Term work **form** to the department in which the course is offered within 2 business days of receiving the decision from the instructor. The Department will arrange for a reappraisal of the work within the next ten business days. The reappraisal will only be considered if the student provides a detailed rationale that outlines where and for what reason an error is suspected. See sections **I.1** and **I.2** of the University Calendar.

    b. **Final Exam:** The student shall submit the request to Enrolment Services. See [Section I.3](#) of the University Calendar.

12. **Other Important Information For Students:**

    a. **Mental Health** The University of Calgary recognizes the pivotal role that student mental health plays in physical health, social connectedness and academic success, and aspires to create a caring and supportive campus community where individuals can freely talk about mental health and receive supports when needed. We encourage you to explore the mental health resources available throughout the university community, such as counselling, self-help resources, peer support or skills-building available through the SU Wellness Centre (Room 370, MacEwan Student Centre, Mental Health Services Website) and the Campus Mental Health Strategy website ([Mental Health](#)).

    b. **SU Wellness Services:** For more information, see their [website](#) or call **403-210-9355**.
Course Outcomes:

- By the end of this course, students should be able to do complexity analysis of algorithms written in a programming language.
- By the end of this course, students should be able to write a program that implements several different sorting algorithms, and create a report that compares their relative performance.
- By the end of this course, students should be able to create a program that implements a linked list data structure using well-structured object-oriented techniques in the Java programming language.
By the end of this course, students should be able to implement stack and queue data structures in the Java programming language.

By the end of this course, students should be able to implement a binary search tree data structure in the Java programming language.

By the end of this course, students should be able to implement a balanced tree data structure (such as an AVL tree) in the Java programming language.

By the end of this course, students should be able to write a program in the Java language that implements a graph data structure with various kinds of graph traversals.

By the end of this course, students should be able to implement a hash table with collision resolution in the Java programming language.