CPSC 320: Intermediate Algorithm Design and Analysis
2009 Winter Term 2
Administration

Home Calendar Administration Textbooks Handouts Assignments/Exams

Description: Systematic study of basic concepts and techniques in the design and analysis of algorithms, illustrated from various problem areas. Topics include: models of computation; choice of data structures; graph-theoretic, algebraic, and text processing algorithms.

Formal Prerequisites: Either (a) CPSC 221 or (b) one of CPSC 216, CPSC 260 and one of CPSC 220, EECE 320. (In addition to above pre-requisites: either (a) 6 credits of 2nd Yr. MATH or STAT or (b) 3 credits of 2nd Yr. MATH or STAT with a grade of 72% or better.)

Ability Prerequisites: Ability to write a proof using mathematical notation. Familiarity with summations, sets, relations, functions, asymptotic notation (O, Ω, Θ), recursion, loop invariants, basic data structures (stacks, queues, linked lists, heaps, graphs, hash tables), sorting algorithms, graph traversal (depth-first and breadth-first search).

Credits: 3.

Recommended Text: Introduction to Algorithms by Cormen, Leiserson, Rivest, and Stein.

Office hours:

Steve	TBA	ICCS 239
Yonatan	TBA	TBA
Shiwen	TBA	TBA
Simon	TBA	TBA

Note: Office hours are *your* time. You needn't make an appointment or wait outside the door. Come right in and take part! (If you want to meet privately with one of us, however, please let us know.)

In addition: (1) Steve has an open-door policy: if my door is open, please come in and talk! Since my door isn't *always* open, you can also e-mail me to make an appointment. (2) Steve will usually be available for ~20 minutes after the end of class. Grab me at the end of class and don't let go until you get your answer (or I pepper-spray you).

Tutorials: Tutorials are your time. They are neither required nor marked. Unless we run low on space, you are free to attend any tutorial (including attending multiple in a week). Unless you anticipate the course will be easy, we **strongly** recommend that you find a time and TA that works well for you and **use** this resource!

Evaluation: Your course mark will be based roughly on the following breakdown. The instructor reserves the right to change this scheme (but does not anticipate using that right).

Assignments (7-10)	20%

Midterm Exams (2)	30%
Final Exam	50%

To pass the course, you must obtain a 50% overall mark and, in addition, you must achieve a passing grade on the final examination. Students who fail the final exam will receive as their course grade the minimum of their normally computed grade and 45%.

Excellent performance on your final may improve your midterm exam marks. **If you earn at least 10% on a midterm**, then the following adjustment applies to that midterm: Let the original mark as a percentage be `m`; let the final mark as a percentage be `x`; the new midterm mark is: `max(m, x-15)`.

All assignments contribute equal weight toward the assignment average; however, your lowest assignment mark will be dropped.

To have an assignment or midterm mark reviewed: staple a note detailing all of your objections to the marking and submit this to your instructor no later than two weeks after the week the marked assignment/exam was returned (regardless of whether you actually collected your assignment/exam at that time). The instructor will then review the marking; the instructor's review decision is final and may either increase or decrease the assigned mark based on your objections or other aspects of the submission.

Important Dates:

Midterm #1	Tuesday, February 2
Midterm Break (extended this year)	February 15–26
Midterm #2	Thursday, March 11
Good Friday/Easter Monday	Friday, April 2 and Monday, April 5
Final Exam	TBD, between April 19 and May 1

Topic/Readings Calendar: Here is a rough schedule of topics and readings *subject to change*, to be firmed up as the term proceeds.

- Jan 4-8: Introduction and asymptotic notation. (Chapters 2 and 3.)
- Jan 11-15: Divide and conquer algorithms, recurrence relations. (Chapter 4.)
- Jan 18-22: The Selection Problem. (Chapter 9.)
- Jan 25-29: Catch-up, exercises, or new material.
- Feb 1-5: Midterm Exam #1 (Feb 2) and Randomized algorithms/data structures. (TBA)
- Feb 8-12: Greedy algorithms and graphs. (Sections 16.2, 22.1, 23, and 24.1–3.)
- Feb 15-19: MIDTERM BREAK
- Feb 22-26: MIDTERM BREAK
- Mar 1-5: Catch-up, exercises, or new material.
- Mar 8-12: Catch-up, exercises, or new material, and Midterm exam #2 (Mar 11).
- Mar 15-19: Dynamic Programming. (Chapter 15.)
- Mar 22-26: Amortized Analysis. (Chapter 17.)
- Mar 29-Apr 1: NP-Completeness and approximation problems. (Chapter 34.)
- Apr 6-9: Catch-up, exercises, or new material. (Easter Monday Apr 5: no T2A.)
- Apr 12-15: Catch-up, exercises, or new material.

Communication: Most electronic communication should go to the bulletin boards on Vista. (**You are expected to read Vista's "Announcements" area daily!** Get a Campus-Wide Login (CWL) to access Vista.) Personal questions or those that might violate academic conduct standards if posted should go to cs320@ugrad.cs.ubc.ca for response by any staff member or to the individual staff member you wish to contact (see the home page).

Assignments: There will be roughly eight written assignments during the term, possibly including a small amount of programming.

- *Submission:* Assignments will be submitted in the hand-in box labeled CPSC 320 outside of ICCS 005.
- *Schedule:* Assignments will normally be due at 5PM on a Friday (with the specific due date listed) unless indicated otherwise.
- *Late Policy:* Late work will receive *no credit*, but we may be flexible if you contact us promptly and well before a due date. So, tell us if you're having trouble!
- *Collaboration:* See the academic conduct guidelines.

Exams: There will be two midterm and one final exam. Straight memorization is not a core course goal. At minimum, we will allow a hand-made reference sheet for exams. Closer to the exam dates, we will announce whether they are open-book (but we do not anticipate making them open-book).

Concession (missing an exam): Do not write an exam if a medical factor might significantly impair your performance. If you are unable to write a **midterm** due to illness, inform your instructor *immediately*, detailing the period during which you were ill, but **do not** present a doctor's note. The instructor will establish and explain accommodation at that time. If you are unable to write the **final** due to illness, contact your Faculty's advising office (e.g., the Science Undergraduate Advising office) immediately. If you have flu-like symptoms, register on the online flu form or your absence may not be excused.

Academic Conduct:

Collaboration enhances the learning experience. We encourage collaboration in various ways throughout the course, subject to the rules stated here:

- **Assignments:** You may work on assignments in groups of two, and we encourage you to do so. (Specific assignments may allow larger groups; any change will be stated in the assignment handout.) Groups are described below. Your group may also work with any other person or resource subject to five rules:
  - The group must spend at least 30 minutes working on each problem independently before collaborating with others.
  - Collaboration with others must be limited to discussion and brainstorming. No record of any sort (e.g., written or electronic material) may be exchanged or leave the brainstorming session.
  - After collaborating, each student must take a half-hour break from the problem. Watching some brainless TV is a recommended activity.

    - Each group must write up their own solution independently, using their own words to prove that they understand the problem on their own.
    - Groups must acknowledge all collaborators or sources of assistance in their submission, although you need only name CPSC 320 course staff, handouts, and required textbooks if you quote or adapt directly from them. (Despite previous rules, you *may* record the names of people you collaborate with!)

- **Groups: must** submit only one joint solution to the assignment and **will** receive one grade for the assignment that applies to every group member. We urge you to collaborate rather than, for example, working on individual parts of the assignment and stitching the result together. Any other approach is likely to lead to disaster on the exams. For advice on group work, speak with the teaching staff and check out All I Need to Know About Pair Programming I Learned in Kindergarten for a lighthearted but well-researched perspective on pair work in Computer Science (for programming but applicable to written assignments).

- **Exams** will follow the University's Rules Governing Formal Examination, including disallowing any communication by any means with anyone besides the exam's invigilators except where specifically noted in exam instructions.

Violation of any of these rules constitutes academic misconduct and is subject to penalties ranging from a grade of zero on a particular assignment to indefinite suspension from the University. If you are uncertain as to what is or is not reasonable collaboration, please contact the instructor. If you are having problems understanding or keeping up with the material, please contact the instructor or a TA to discuss how we can fix the problem. Don't cheat!

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