CMPUT 204: Algorithms I (Winter 2004 Course Page)

Time	Monday	Tuesday	Wednesday	Thursday	Friday
08:00-08:50		J2/EJ2 (CAB 281):		J5/EJ5 (CAB 269):	
10:00-10:50	B1/EB1 (V 114): Bowling		B1/EB1 (V 114): Bowling		B1/EB1 (V 114): Bowling
12:00-12:50	B2/EB2 (CSC B10): Lin		B2/EB2 (CSC B10): Lin		B2/EB2 (CSC B10): Lin
13:00-13:50				J6/EJ6 (BS M 141):	
14:00-14:50	B3/EB3 (V 112): Leonard		B3/EB3 (V 112): Leonard		B3/EB3 (V 112): Leonard
16:00-16:50	J1/EJ1 (CAB 273):		J4/EJ4 (CAB 269):		
17:00-17:50		J3/EJ3 (CAB 269):			

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What's New: (204 students check this page often !)

1. Dec 1, 2003: Course page up. Most of the links will be activated before the class.
2. Newsgroup: ualberta.courses.cmput.204

Textbook : T. H. Cormen, C. E. Leiserson, R. L. Rivest, and C. Stein. Introduction to Algorithms (Second Edition). McGraw Hill. 2001.

Lecture Slides & Calendar

Week	Date	Seminars	Lecture Topics	Slides
1	Jan 5	no seminar	Course overview, basic concepts (Chap 1)	Pre01.pdf
	Jan 7		Getting started with insertion sort (Chap 1-2, Appendix A-C)	Pre02.pdf
	Jan 9		Insertion sort: analysis (Chap 2)	Pre03.pdf
2	Jan 12	Orientation/ Teaching (Mon-Thu)	Merge sort: analysis (Chap 2); big *O* (Chap 3)	Pre04.pdf
	Jan 14		Growth of functions (Chap 3)	Pre05.pdf
	Jan 16		Example answers to problems	Pre06.pdf

3	Jan 19	Teaching Assignment 1 due Friday in class	Recurrence and iterated substitution (Chap 4)	Pre07.pdf
	Jan 21		More iterated substitution examples and recursion tree (Chap 4)	Pre08.pdf
	Jan 23		Iterated substitution leading to Master Theorem (Chap 4)	Pre09.pdf
4	Jan 26	Quiz 1 (Mon-Thu)	Full version of Master Theorem, and its limit (Chap 4)	Pre10.pdf
	Jan 28		Recurrence review and example answers to problems	Pre11.pdf
	Jan 30		Heap, its properties and construction (Chap 6)	Pre12.pdf
5	Feb 2	Teaching Assignment 2 due Friday in class	Heapsort: algorithm and its analysis (Chap 6)	Pre13.pdf
	Feb 4		Heapsort analysis and more discussion (Chap 6)	Pre14.pdf
	Feb 6		Priority queue and quicksort algorithm (Chap 6-7)	Pre15.pdf

6	Feb 9	Quiz 2 (Mon-Thu)	Quicksort BC, WC running time (Chap 7)	Pre16.pdf
	Feb 11		Quicksort AC running time and two kinds of trees (Chap 7-8.1)	Pre17.pdf
	Feb 13		Decision tree lower bound (Chap 8.1) and DP (Chap 15)	Pre18.pdf
7	Feb 16	Reading week		
8	Feb 23	Teaching Assignment 3 due Friday in class	DP concepts and Matrix-chain multiplication (Chap 15.2-3)	Pre19.pdf
	Feb 25		DP more characteristics and LCS problem (Chap 15.4)	Pre20.pdf
	Feb 27		DP review and example answers to problems	Pre21.pdf
9	Mar 1	Quiz 3 (Mon-Thu)	Graph notions (Chap 22.1)	Pre22.pdf
	Mar 3		Disjoint sets: array of representatives (Chap 21.1-2)	Pre23.pdf
	Mar 5		Midterm	
	Mar 8	Teaching	Disjoint sets: forest of rooted trees (Chap 21.3)	Pre24.pdf

10	Mar 10	Assignment 4 due Friday in class	Union by rank and compressed find (Chap 21.4)	Pre25.pdf
	Mar 12		Graph notions and Breadth-First-Search (Chap 22.1-2)	Pre26.pdf
11	Mar 15	Quiz 4 (Mon-Thu)	Depth-First-Search and bicomponents (Chap 22.3, Prob 22-2)	Pre27.pdf
	Mar 17		Review: graph notions, BFS/ DFS, bicomponents	Pre28.pdf
	Mar 19		Greedy algorithms, MST problem (Chap 23.0-2)	Pre29.pdf
12	Mar 22	Teaching Assignment 5 due Friday in class	Greedy, MST problem, Prim's algorithm (Chap 23.0-2)	Pre30.pdf
	Mar 24		Prim's and Kruskal's MST algorithms (Chap 23.2)	Pre31.pdf
	Mar 26		SSSP problem and Dijkstra's algorithm (Chap 24.0, 24.3)	Pre32.pdf
	Mar 29	Quiz 5	Bellman-Ford's algorithm (Chap 24.1)	Pre33.pdf

13	Mar 31	(Mon-Thu)	Main ideas and basic concepts (Chap 34)	Pre34.pdf
	Apr 2		Polynomial time reduction and NP-completeness (Chap 34)	Pre35.pdf
14	Apr 5	Teaching Assignment 6 due Wednesday in class	Cook's Theorem and NP-completeness proofs (Chap 34)	Pre36.pdf
	Apr 7		Example NP-completeness proofs (Chap 34)	Pre37.pdf

Grading Scheme (Winter 2004) :
Mark distribution:

1. 26% (5% + 5% + 5% + 5% + 4% + 2%) 6 Assignments
2. 24% (5% + 5% + 5% + 5% + 4%) 5 Quizzes
3. 15% Midterm (in class, 50 minutes)
4. 35% Final Exam (3 hours)

Note:

- Any questions concerning the marking of an assignment or a term test (quiz or midterm) should be brought to the attention of the marker (this will be either the instructor or a TA) within 7 days of the date on which the assignment or the test has been returned to the class (lecture or seminar) in question;
  After that time, marks cannot be

changed.

- No late policy for assignments. Assignments are due in lecture classes.
- Quizzes, Midterm, and Final Exam absence may result in a mark of 0, unless an acceptable excuse exists and is supported by documentation, in which case
  - for a missed quiz, the marks will be added to either the midterm or the final exam, whichever comes next;
  - for a missed Midterm, the marks will be added to the final exam;
  - for a missed Final Exam, the student must apply to the Faculty of Science (not the instructor) for permission to write the deferred exam. The time/date of the deferred exam for Winter 2004 will be Friday April 23, 2004, 1:00pm, ATH 332.
  - The University's exam policy.
- Following recent departmental practice, all cases of plagiarism will be forwarded by the instructor to the dean.
  See The Code of Student Behavior.
- Grade cutoffs will be assigned within a few points of each of the following, taking into consideration the final distribution of marks:
  - A 90
  - B 78
  - C 65
  - D 50
- This course has multiple sections. You must write all exams/quizzes in the lecture/seminar sections in which you are registered, because lectures and exams vary slightly

between sections. So should you attend the lectures in which you are registered.

- Final grade cutoffs for each section will be set individually, in consultation with the instructors of the other sections.

Assignment Lists :

	Topics covered	Partial solutions
Assignment 1	Loop invariant Insertion-sort Merge-sort Asymptotic notations	Partial solution 1
Assignment 2	Recurrences Heaps	Partial solution 2
Assignment 3	Heap-sort Priority-queue Quick-sort Sorting lower bound	Partial solution 3
Midterm		Sample Midterm
Assignment 4	Dynamic programming concepts Matrix-chain multiplication Longest common subsequence Disjoint-sets and Union-find	Partial solution 4
Assignment 5	Graph traversals: BFS & DFS Biconnected component MST algorithms (Kruskal & Prim)	Partial solution 5
Assignment 6	Decision problems, P & NP, NP-completeness	Partial solution 6

Final		Sample Final

Note:

1. Problems on polynomial time reductions and NP-completeness proof (pages 984-1021, read very carefully and do all the exercises) are not covered in the quizzes. However, they are topics to be covered in the Final Exam too.
2. Partial solutions to each assignment will be posted on Sunday following the assignment due date.

Seminars :

- There are 6 seminars used for teaching, where students are encouraged to discuss; There are 5 seminars used for monitoring quizzes, each of which consists of 3 questions similar to questions in the corresponding assignment.
- Unless otherwise authorized by an instructor, students must write the quiz in the section in which they are registered.

Smart Studying Scheme : It is strongly recommended that you understand the topics in the lecturing days. Leaving them behind causes serious trouble according to former CMPUT 204 students. Some key points of success are listed in the following. (Nonetheless, following them all does not necessarily guarantee high marks.)

- Lecturing contents:
  - Before the lectures, print out the agenda and have (at least) 30 minutes going

through the related textbook chapters (appendix);
    - After the lecture, have (at least) 30 minutes going through the slides and the related textbook chapters (appendix) again.
    - Turn to either instructors (after lecture or office hours) or TAs (seminars, emails, newgroups) for the parts you don't understand well.
- Assignments:
    - After reviewing the lecture contents, solve the related questions in the assignments. Students are encouraged to discuss and study in small groups. Nonetheless, software will be applied to scan for plagiarism/cheating.
    - Turn to instructors or TAs for help, ONLY after you have seriously thought about the questions for some time.
- Quizzes & Midterm:
    - Check with TAs and/or instructors to make sure you can solve every question in the Quizzes and Midterm.
    - Don't miss any one of the questions! Similar questions might occur again in the Final.
- Using office hours:
    - Take advantage of the office hours! If you do have time conflicts, send emails to request for an appointment.
- The expected hours per week: at least 10.

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This page is under construction (12/12/2003).