

CS5206 (Fall 2008)

Fundamentals in Algorithms

Course Web: <http://www.comp.nus.edu.sg/~cs5206/2008/>

Monday, 6:30 – 8:30pm @AS6-206

Leong Hon Wai, COM1 03-41

Tentative Course Schedule (Rev: 31/08/2008)

| Wk | Date | In / Out | Topic |
|----|-------|---------------------|---|
| 0 | 04/8 | Out: HW0 | Course Overview [Quick 20min session] |
| 1 | 11/8 | Out: HW1 | Motivation: Stable Marriage, Mathematics for AA; Recurrence Relations; (Revise Master Theorem on your own) |
| 2 | 18/8 | | Randomized Quicksort, Interval Scheduling DS and Alg Design; Augmenting Data Structures; |
| 3 | 25/8 | In: HW1 Out: HW2 | Shortest Path Algorithms, MST, Heaps |
| 4 | 01/9 | Out: LEDA-1 | Binomial Heaps, LEDA, Amortized Complexity; |
| 5 | 08/9 | In: HW2 Out: HW3 | F-Heaps and Dynamic Programming |
| 6 | 15/9 | In: LEDA-1 | Graph Partitioning, BAP & Project |
| B | 22/9 | | * BREAK * BREAK * |
| 7 | 29/9 | | Network Flows and Matching |
| 8 | 06/10 | | NP-Completeness & Cook's Theorem |
| 9 | 13/10 | Maybe Conf trip | Proving NP-Completeness |
| 10 | 20/10 | | Approximation Algorithms |
| 11 | 27/10 | | Local Search Algorithms I |
| 12 | 03/11 | | Local Search Algorithms II |
| 13 | 10/11 | | Student Project Presentation |
| S | 17/11 | | * STUDY WEEK * STUDY WEEK * |
| E | 01/12 | Monday Evening | Final Exam (OPEN BOOK) |

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Reading Assignments

Wk1: Stable Marriage; Algorithm as Enabling Technology; Mathematics of AA;
Recurrence Relations; Master Theorem; ([KT06]-Ch-1,2, [CLRS]-Ch-2-4, App.A)

Wk2: Randomized Quicksort, Interval Scheduling and Related Problems;
Augmenting Data Structures; ([KT06]-Ch-13.5, 1, 4.1-4.2; [CLRS]-Ch-14)

Wk3: Graph Shortest Path Algorithm, MST, Heaps and Priority Queues
([KT06]-Ch-2.5, 3, 4.4-4.5, 6.8;)

Wk4: Binomial Heaps, LEDA, Amortized Complexity;
([KT06]-Ch-?; [CLRS]-Ch-17,19; [LN])

Wk5: Fibonacci Heaps, Dynamic Programming
([KT06]-Ch-6; [CLRS]-Ch-16,20; [LN])

Wk6: Graph Partitioning, BAP & Project
([KT06]-Ch-12.4-12.5; [LN])

BREAK

Wk7: Network Flows and Matching
([KT06]-Ch-7; [CLRS]-Ch-26; [LN])

Wk8: NP-Completeness & Cook's Theorem
([KT06]-Ch-8; [CLRS]-Ch-34; [LN])

Wk9: Proving NP-Completeness
([KT06]-Ch-8; [CLRS]-Ch-34; [LN])

Wk10: Approximation Algorithms
([KT06]-Ch-11; [CLRS]-Ch-35; [LN])

Wk11: Local Search Algorithms I
([KT06]-Ch-12; [LN])

Wk12: Local Search Algorithms II
([KT06]-Ch-12; [LN])

Wk13: Student Project Presentation