CS5206 (Fall 2011)
Foundations in Algorithms

Course Web: http://www.comp.nus.edu.sg/~cs5206/2011/
Tuesday, 6:30 – 8:30pm SR3 (COM1-212)
Leong Hon Wai, COM1 03-17

Tentative Course Schedule (*Rev*: *19-Oct-2011*)

Wk	Date	In / Out	Topic
1	08/08		*** No Lecture ** (Rag and Flag Days)*
2	15/8	*HW1 out*	*Motivation:* Stable Marriage Problem, Sample Problems, Interval Scheduling
3	22/8	*HW1 due* *HW2 out*	*Divide and Conquer Algorithm + Master Theorem* Randomized Quicksort (*analysis*!)
4	29/8		*Greedy Algorithms:* Interval Scheduling, Shortest Path Algorithms, MST, Heaps
5	05/9	*HW2 due*	*Dynamic Programming Algorithms*: (*Guest Lecturer*)
6	12/9	*HW3 out*	*LEDA, Heaps and Binomial Heaps*
B	19/9	*HW3 Due*	*Amortized Complexity,* *F-Heaps*
7	26/9		**Mid-Term (26/9, Mon, 7-9pm)**
8	03/10	*HW4 out* *Proj out*	*DNSRA, F-Heap*
9	10/10	*Proj-M1 due*	*Problem Reduction, P, NP, and NP-Completeness*
10	17/10	*Proj-M2 due*	*Proving NP-Completeness*
11	24/10	*HW4 due* *HW5 out*	*Cook's Theorem* & *Approximation Algorithms*
12	31/10	*HW5 due*	*Network Flows and Maximum Matching*
13	07/11	*Proj-M3 due*	*Special Topic: To be announced*
S	14/11	*STUDY WK*	**** Project Presentation (16-17 Oct) **** **and maybe Demo**
E	29/11		***Final Exam* (*Open Book*)**

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