TEACHING PLAN FOR SEMESTER 2 AY2021-22

EE2008/IM1001   **DATA STRUCTURES AND ALGORITHMS**
Course
Coordinator: A/P Li Kwok Hung (Office: EEE-S1-B1b-62; Tel: 6790-5028)

Acad Unit: 4 AUs
Contact Hours: 3-hour online lecture and 1.5-hour tutorial session per week, and two 3-hour scheduled sessions for laboratory assignments. In total, 39 lecture hours, 19.5 tutorial hours, and 6 lab hours per semester.

Course Grade: Letter Grade
Doc. Version: Ver 2

WEEKLY CLASS SCHEDULE**

Week	Topics	Activities
1	<u>Introduction</u> Overview of algorithms and data structures. Algorithm language. Mathematical preliminaries. **LAMS Video Lecture – Week 01**	1.5-hr interactive tutorial through Zoom/Teams (*Weekly Study Guide*, *Week01_Briefing*, Tutorial no. 01)
2	<u>Principles of Algorithm Analysis</u> Growth rates of functions. Asymptotic notations. Basic recurrences. Analysis of algorithms. **LAMS Video Lecture – Week 02**	IRA #A1 for Group-A students (F2F) 1.5-hr interactive tutorial - Group A F2F, Group B online (Tutorial no. 02)
3	<u>Data Structures</u> Elementary data structures. Abstract data types. Stacks and queues. **LAMS Video Lecture – Week 03**	IRA #B1 for Group-B students (F2F) 1.5-hr interactive tutorial - Group B F2F, Group A online (Tutorial no. 03)
4	<u>Data Structures</u> Stacks and queues. Vectors, Lists, and Sequences, Trees. **LAMS Video Lecture – Week 04**	IRA #A2 for Group-A students (F2F) 1.5-hr interactive tutorial - Group A F2F, Group B online (Tutorial no. 04) Homework Assignment #1 (due date: Tutorial class of Week 5)
5	<u>Data Structures</u>	IRA #B2 for Group-B students (F2F)

	Priority Queues & Heaps, Dictionaries & Hash tables. **LAMS Video Lecture – Week 05**	1.5-hr interactive tutorial - Group B F2F, Group A online (Tutorial no. 05)
6	<u>Search Trees</u> Binary Search Trees, AVL trees, Bounded-Depth Search Trees. **LAMS Video Lecture – Week 06**	IRA #A3 for Group-A students 1.5-hr interactive tutorial - Group A F2F, Group B online (Tutorial no. 06)
7	<u>Sorting</u> Elementary sorting algorithms. Quicksort. Merge Sort, Bucket Sort, Radix Sort **LAMS Video Lecture – Week 07**	Quiz (covering Weeks 1 - 5) during tutorial class; First 40 min for Group A; Second 40 min for Group B Tutorial no. 07 will be conducted online
	Recess Week	
8	<u>Sorting</u> Heapsort. Comparisons of Sorting Algorithms, Order statistics. **LAMS Video Lecture – Week 08**	IRA #B3 for Group-B students (F2F) 1.5-hr interactive tutorial - Group B F2F, Group A online (Tutorial no. 08)
9	<u>Searching</u> Binary search. Breadth-first search. **LAMS Video Lecture – Week 09**	IRA #A4 for Group-A students (F2F) 1.5-hr interactive tutorial - Group A F2F, Group B online (Tutorial no. 09)
10	<u>Searching</u> Depth-first search. **LAMS Video Lecture – Week 10**	IRA #B4 for Group-B students (F2F) 1.5-hr interactive tutorial - Group B F2F, Group A online (Tutorial no. 10)
11	<u>Searching</u> Text searching. Backtracking **LAMS Video Lecture – Week 11**	IRA #A5 for Group-A students (F2F) 1.5-hr interactive tutorial - Group A F2F, Group B online (Tutorial no. 11)

		Homework Assignment #2 (due date: Tutorial class of Week 12)
12	<u>Algorithm Design Techniques</u> The Greedy Method. Divide and conquer. Dynamic programming **LAMS Video Lecture – Week 12**	IRA #B5 for Group-B students (F2F) 1.5-hr interactive tutorial - Group B F2F, Group A online (Tutorial no. 12)
13	<u>Algorithm Design Techniques</u> The Greedy Method. Divide and conquer. Dynamic programming **LAMS Video Lecture – Week 13**	1.5-hr interactive tutorial through Zoom/Teams (Tutorial no. 13)

** Due to the Cov-19 situation, the schedule may need to update from time to time. In case IRAs are partially canceled, the weightage of the quiz will be adjusted accordingly. You will be informed when necessary revisions are required.

ASSESSMENT SCHEDULE

Type	Description	Start Date	End Date
CA – Assignment 1 (5%)	Lecture topics for Weeks 1-4 will be covered.	Tutorial Class, Week 4	Tutorial Class, Week 5
CA – Quiz (10%)	Lecture topics for Weeks 1-5 will be covered.	Tutorial Class, Week 7	Tutorial Class, Week 7
CA – Lab sessions: L2008A and L2008B (10%)	Two lab sessions are incorporated into this course. The two lab modules will strengthen and reinforce concepts taught in lectures.	See class schedule for lab sessions	Duration: 3 hours for each session
CA – Assignment 2 (5%)	Lecture topics for weeks 1-10 will be covered.	Tutorial Class, Week 11	Tutorial Class, Week 12
CA – IRA (10%)	Individual Readiness Assessments (IRAs) will be conducted by individual instructors during tutorial classes (Schedule: *Week01_Briefing*).	At the beginning of tutorial classes	Duration: 15 mins

Final Exam (60%)	Includes all contents covered in the lectures. Closed book. Duration 2 hr 30 min.	9:00 am Fri, 22 Apr 2022	11:30 am Fri, 22 Apr 2022