KẾ HOẠCH TRIỂN KHAI HỌC PHẦN
PLAN OF COURSE IMPLEMENTATION
(DANANG CAMPUS)

TRƯỜNG ĐẠI HỌC FPT

1. **Tên học phần**/*Course name: Data structures and Algorithms in Java*
2. **Thời gian triển khai: Học kỳ: SUMMER 2023 từ 05/2023 đến 07/2023**
3. ***Lịch triển khai môn học: Social Contructivism, 14 Slot***

Week	Slot ID	Topic	Teacher / Group Presentations (A, B, C, D, E and F; Rounds: 1, 2, 3)	Act.	Mark	Group-Round
01: 08/05-14/05	1	[1] Linked List	Introduction to DSA Singly linked list Circular, Doubly LL	Submit code 1	+	Teacher
	2	[2] Stacks & Queues	R1_Use a circular linked list to solve the Josephus problem? R2_How to implement a stack using an array? R3_Can we evaluate a suffix expression (using a stack)?	SC01_DN [02]	A1	A-1 B-2 C-3
02: 15/05-21/05	3	[2] Stacks & Queues	R1_How to convert an infix expression to a suffix one (using a stack)? R2_How to implement an queue using a circular array? R3_How to implement priority queue using linked list?	SC02_DN [03]		D-1 E-2 F-3
	4	[3] Recursion	R1_Give examples of linear, binary and multiple recursions? R2_Show the ways to convert a non-tail recursion to a tail one (or a loop)? R3_Using backtracking to enumerate bit strings and combinators?	SC03_DN [04]		A-1 B-2 C-3
03: 22/05-28/05	5	[4] Trees: Binary, Binary Search, AVL	Build a binary search tree Max (recur, loop), Tree sort (LNR), The height (recur)	Submit code 2	+	Teacher
	6	[4] Trees: Binary, Binary Search, AVL	R1_How many ways to delete a node in a binary search tree? Comparing them! R2_Print the oreorder traversal of the given binary tree using recursion and loop? R3_How to traverse a binary tree by preorder traversal using recursion and loop?	SC04_DN [06]	A1	D-1 E-2 F-3
04: 29/05-04/06	7	[4] Trees: Binary, Binary Search, AVL	R1_How to build a binary search tree of the smallest height from an integer array? R2_Comprise the 2-tree from 2 traversals of inorder&postorder, using a recursion? R3_Reconstruct the 2- tree from two traversals of inorder&preorder, using a loop?	SC05_DN [07]		A-1 B-2 C-3
	8	[4] Trees: Binary, Binary Search, AVL	R1_Print the level of each node in a binary tree? R2_How many ways to display/draw a binary tree in a console window? R3_What are rotations in AVL tree and their applications?	SC06_DN [08]		D-1 E-2 F-3
05: 05/06-11/06	9	Progress Test 1	Review [1-4] with multiple choices questions Progress Test 1 (45 minutes, 25 questions) Discuss	T1		Teacher
	10	[5] Graph	R1_What are the data structures to represent the graph? R2_How to traverse a graph by a breadth first search using a recursion and a loop? R3_How to traverse a graph by a depth first search using a recursion and a loop?	SC07_DN [10]	A1	A-1 B-2 C-3
06: 11/06-18/06	11	[5] Graph	R1_How to find the shortest path between two vertices in a graph using Dijkstra's R2_What is Bellman-Ford' algorithm? R3_Find the shortest path between every pair of vertices using Floyd's algorithm?	SC08_DN [11]	A2	D-1 E-2 F-3
	12	[5] Graph	R1_How to find the minimum spanning tree in a graph using the algorithm PRIM? R2_Use Kruskal's algorithm to find the minimum spanning tree in a graph? R3_Show me the way of graph coloring with the minimum number of colors?	SC09_DN [12]		A-1 B-2 C-3
07: 19/06-25/06	13	[5] Graph	Read an adj weighted matrix from file Check whether or not an Euler cycle/path exists Using a backtracking algorithm for finding Hamilton cycles	Submit code 3	+	Teacher
	14	[6] Sort	R1_What are elementary sorting algorithms? Using them to sort arrays of random R2_Can you describe Merge sort? R3_How to implement Radix sort?	SC10_DN [14]	A2	D-1 E-2 F-3
08: 26/06-02/07	15	[6] Sort	R1_Can we use heap data structure for sorting a set of integers? R2_Can we implement Insertion sort in a singly linked list? R3_Can we implement Quick sort in a singly linked list?	SC11_DN [15]		A-1 B-2 C-3
	16	[7] Hash	R1_Count the no of occurrences of each different word in a text file using a HashMap? R2_Implement Hash table with separate chaining using list? R3_Implement Hash table with opening addressing: linear and quadratic probing?	SC12_DN [16]		D-1 E-2 F-3
09: 10/07-16/07	17	[8] Text	Training for Practical Exam (PE) 85 minutes, LMS, Write Java code Topics: [1, 2, 3, 4, 6]	Submit code 4	+	Teacher
	18	[8] Text	R1_Compare lossless & lossy compressing methods? Describe run length algorithm? R2_How to use a binary tree to encrypt a text file? R3_What is the LZW algorithm? How does it work?	SC13_DN [18]	A2	A-1 B-2 C-3
10: 17/07-23/07	19	[8] Text	R1_How to solve the string matching problem using a Brute-Force algorithm? R2_Can we search for a pattern in a string in linear time (KMP)? R3_What is Dynamic programming? Give some illustration?	SC14_DN [19]		D-1 E-2 F-3
	20	Progress Test 2	Review [5-8] with multiple choices questions Progress Test 2 (60 minutes, 50 questions) Discuss	T2		Teacher

Assignments (20%): A1 10%, A2 10%; Tests (20%): T1 10%, T2 10%; PE: 30%

Người phê duyệt/*Approver* *GĐCS/Campus's Director*	Người kiểm tra/*Reviewer* *TBĐT/Head of Academic Affairs Board)*	Người lập/*Creator* *CNBM/Head of department*
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