NANYANG TECHNOLOGICAL UNIVERSITY
SINGAPORE

SC1007: DATA STRUCTURES AND ALGORITHMS

Course Introduction

College of Engineering
School of Computer Science and Engineering

INSTRUCTOR INFORMATION: CONSULTATION

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- Office hours:
  - **Thursday 10.00 AM-1.00 PM** (no appointment needed)
  - Other times by appointment (Email)

ROADMAP (LECTURES): FIRST HALF

Week	Lecture (Venue: LKC-LT) Tuesday: 2.30 PM – 4.30 PM
1	Introduction to Data Structure
2	Introduction Linked List (LL)
3	Linked List (LL) – Linear Search
4	Stack and Queue (SQ) – Arithmetic Operations
5	Binary Trees (BT) and Binary Search Trees
6	Binary Trees - Binary Search and AVL Trees
7	Analysis of Algorithm (AA)

ROADMAP (LABS AND TUTORIALS): FIRST HALF

Week	Tutorial	Lab
1	**No Tutorial**	**No Labs**
2	**No Tutorial**	**No Labs**
3	**No Tutorial**	Linked Lists
4	Linked Lists	Stack and Queues
5	**No Tutorial**	**No Labs**
6	Stack and Queues	Binary Trees
7	Binary Tree and Binary Search Trees	Binary Search Trees

ROADMAP (ASSIGNMENTS): FIRST HALF

NO	Assignment	Release date	Deadline (11.59 PM)
1	Linked Lists	26/1/2024	09/2/2024
2	Stack and Queues	09/2/2024	23/2/2024
3	Binary Tree and Binary Search Trees	16/2/2024	01/3/2024

www.hackerearth.com online platform will be used for the assignment's submission.

ROADMAP (LAB TEST)

Week	Lab Test 1
Recess Week	**05/03/2024 - 06/03/2024**

Lab Test information will be released two weeks before the deadline.

www.hackerearth.com online platform will be used for the lab test.

LEARNING OBJECTIVES

- Lectures focus on introduction to concepts
- Tutorials focus on understanding the concepts
- Lab Sessions focus on practice and realization
- Assignments and Lab Tests are assessments

LEARNING OUTCOMES

- Select appropriate data structures and Algorithm
- Implement algorithms to solver real world problems using C Language
- Conduct complexity analysis of algorithms

OVERVIEW OF SC1007

- **Data Structures**:
  - Concepts of pointers and structures (aggregates)
  - Introduce some classical data structures
    - Linear: Linked list, stack, queue
    - Nonlinear: tree
  - Implement these data structures
- **Algorithms**:
  - Analysis of Algorithm time complexity and space complexity
  - Introduce to some typical algorithms and their applications
  - Introduce to some algorithm design strategies
- **Implementation**:
  - C programming

GOALS

"I will, in fact, claim that the difference between a bad programmer and a good one is whether he considers his code or his data structures more important. Bad programmers worry about the code. Good programmers worry about data structures and their relationships."

Linus Torvalds, 2006

(Creator of the Linux kernel)