University of Management and Technology
School of Commerce and Accountancy
Quaid e Azam Campus

Course Outline

Course Title: Data Structures and Algorithms (CS322)	
Program	ADP(CS)
Credits Hours	3
Duration	15 Weeks / 30 Sessions
Prerequisites	
Resource Person	
Contact/Email	

Course Objectives:

Data structures are the building blocks of computer software. This course is designed to teach students some of the basic data structures, abstract data types (ADTs), and algorithms. Students will learn the fundamental techniques of data representation, organization, storage, searching, sorting, retrieval, and manipulation. Students will also be introduced to the notions of time and space complexities of algorithms and data structures. So that the students can appreciate the time and space tradeoffs, the basic concepts, implementations, performance, and applications of the various data structures and algorithms will be integrated throughout the course. Students shall gain hands-on experience through several programming exercises. Programming language: C++

Teaching-Learning Methodology:

Note: <u>Select methodologies as per nature of the course.</u>

- Lectures
- Recommended Text/Supplementary Texts
- Handouts
- Case Studies
- Skill Development Exercises
- Project Report/Term Paper
- Any other Teaching Tool…………………………………………

Recommended Text Book:

1. Data Structures and Algorithm Analysis in C   2nd Edition

By: M. A. Weiss, Pearson Education

Supplementary Text Books:

Any good C programming book such as Kernighan and Ritchie's The C Programming Language, Deitel and Deitel's C How to Program or Herbert Schildt's C The Complete Reference will be helpful for the programming assignments

Assessment & Evaluation:

*Note: **Please Specify the Weightage you want to assign to assignments and Final Project/ Project presentation/Presentation.***

Quizzes	**15%**
Assignments	
Final Project	**20%**
Project Presentation/Presentations	
Mid Term	**25%**
End Term Exam	**40%**
Total:	**100**

SEHEDULE OF ACTIVITIES

Note: Please fill the tasks/activities column according to your course plan

Week	Contents/Topics to be Taught	Tasks/Activities
1	Introduction Data types, Data objects	Course Outline Distribution
2	Simple Array Implementation	
3	Stack Model Implementation of stack	Quiz 1
4	Data types and abstract data types (ADTs)	Assignment 1
5	Introduction to recursion	
6	Stacks Queues	Assignment 2
7	Stack: Infix, Prefix, Postfix LinkedLists	Quiz 2
8	**MID TERM EXAMINATION**	
9	Linked List, Double Linked Lists	

10	Queues Trees	Quiz 3
11	Binary search trees (BSTs), AVL Trees	
12	Hashing: open hashing Hashing: closed hashing, rehashing,	Quiz 4
13	Internal Sorting	
14	Bubble sort, Insertion sort, selection sort, Merge sort, Heap sort	Assignment 4
15	Student presentations and class discussions	Presentations (if any)
16	**END TERM EXAMINATION**	