Arab Academy for Science and Technology and Maritime Transport
Computer Science Curriculum
Course Syllabus

Course Code: CS212	Course Title: Data Structures and Algorithms	Classification:	Coordinator: Dr. Nahla Belal **Lecturer:**	Credit Hours: 3
Pre-requisites: CS243 (Object-Oriented Programming)	**Co-requisites:** None	**Schedule:** Lecture: Tutorial-Lab:	2 hours 2 hours	

Office Hours:

Course Description:
This course covers the organization of data and algorithms that act upon them. The topics of linked lists, stacks, queues, trees and graphs as well as hashing are introduced. Algorithms manipulating data structure, like searching and sorting, memory allocation and file management are included. The concept of abstract data types is also introduced.

Textbook:

Noel Kalicharan, *Data Structures in C*, Create Space Independent Publishing Platform.

References:

- Adam Drozdek, *Data Structures and Algorithms in C++,* Course Technology.
- Mark Allen Weiss, *Data Structures & Algorithm Analysis in C++*, Pearson.

Course Objective/Course Learning Outcome:	Contribution to Program Student Outcomes:
1. Understand the difference between static and dynamic data types. 2. Understand the concept of pointers & dynamic memory allocation. 3. Acquire practical programming experience using dynamic structures	(SO-1) Analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions.
4. Analyze the organizations of proposed data structures and how to use them efficiently. 5. Apply the acquired knowledge in many practical applications like database, network, compiler and others..	(SO-2) Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline.
6. Demonstrate the ability to design abstract data types using various data structures	(SO-6) Apply computer science theory and software development fundamentals to produce computing-based solutions.

Course Outlines:

1. Introduction to Data Structures
2. Linked Lists
3. Doubly and Circular Linked Lists
4. Stacks
5. Queues
6. Applications of Stacks and Queues
7. **7th Week Assessment**

8. Trees Representation
9. Binary Search Trees
10. Applications of Binary Trees
11. Graph Representation
12. **12th Week Assessment**
13. Graph Algorithms
14. Hashing
15. Revision
16. **Final Exam**

Grade Distribution:

7th Week Assessment (30%)

12th Week Assessment (20%)

Year Work (10%)

Final Exam (40%)

Policies:

Attendance:
AASTMT Education and Study Regulations (available at aast.edu)

Academic Honesty:
AASTMT Education and Study Regulations (available at aast.edu)

Late Submission:
Late submissions are not permitted