



University/Academy: Arab Academy for Science, Technology & Maritime Transport
Faculty/Institute: College of Engineering & Technology
Program: B.Sc. Computer Engineering

Form no. (12): Course Specification

1- Course Data

Course Code: CC215	Course Title: Data Structure	Academic Year/Level: 2nd year / 4th semester
Specialization: Computer Engineering	Credit Hours: 3 Lecture: 2 Tutorial: 2 Lab: 0	Prerequisite ----- CC213

2- Course Aim

- Understand the difference between static data type and dynamic data types
- Understand the concept of pointers & dynamic memory allocation
- Acquire practical programming experience using dynamic structures

3- Intended Learning Outcomes

a- Knowledge and Understanding	<p>Through knowledge and understanding, students will be able to:</p> <p>a1. Concepts and theories of mathematics and sciences, appropriate to the computer engineering.</p> <ul style="list-style-type: none"> • Demonstrate the uses, performance characteristics, and typical implementations of the different standard abstract data types. • Demonstrate the uses, performance characteristics, and typical implementations of the classical graph algorithms • Explain the relative advantages of using arrays, vectors, and linked lists in solving computational problem efficiently.
b- Intellectual Skills	<p>Through intellectual skills, students will be able to:</p> <p>b2. Think in a creative and innovative way in problem solving and design using the latest technologies and solve engineering problems, often on the basis of limited and possibly contradicting information while identifying symptoms in problematic situations.</p> <ul style="list-style-type: none"> • Apply stacks, queues, trees, and graphs to solve real-life problems <p>b3. Combine, exchange, and assess different ideas, views, and knowledge from a range of sources.</p> <p>b4. Assess and evaluate the characteristics and performance of components, systems and processes and investigate their failure.</p> <ul style="list-style-type: none"> • Demonstrate how to analyze the complexity of algorithms, and to express it using asymptotic notation
c- Professional Skills	<p>Through professional and practical skills, students will be able to:</p> <p>c4. Apply numerical modeling methods to engineering problems.</p> <ul style="list-style-type: none"> • Write programs using abstract data types. • Manipulate programming tools for compilation control, editing, version control, and debugging • Find and correct bugs in the programs, and to use a debugger to do so.
d- General Skills	<p>Through general and transferable skills, students will be able to:</p> <p>d3. Demonstrate efficient IT capabilities.</p> <ul style="list-style-type: none"> • Practice problem solving Skills. • Practice designing programs Skills • Propose suitable abstract data type for problem solution

4- Course Content

Week No.1	Introduction to Data Structures
Week No.2	Arrays
Week No.3	Pointers and dynamic memory allocation
Week No.4	Linked Lists
Week No.5	Doubly and circular Linked Lists
Week No.6	Stack
Week No.7	7 th Week Exam +Stack Applications
Week No.8	Stack applications
Week No.9	Queues
Week No.10	Trees Representation
Week No.11	Binary Search Trees
Week No.12	12 th Week Exam + Binary Search Trees.
Week No.13	Hash Representation
Week No.14	Graph Algorithms
Week No.15	Graph Traversals
Week No.16	Presentation of projects and Final Exam.

5- Teaching and Learning Methods

<ul style="list-style-type: none"> • Lectures • Tutorials • Reports & sheets • Laboratories • Seminars

6-Teaching and Learning Methods for Students with Special Needs

<ul style="list-style-type: none"> • Lectures • Tutorials • Reports & sheets • Laboratories • Seminars
<p>The academic advisors of each student, as well as dedicated department TAs monitor the students' progress and solve any problem he/she may encounter.</p>

7- Student Assessment

a-Procedures used	1-Written Examinations to assess The Intended Learning Outcomes.	
	2-Class Activities (Reports, Discussions, -----) to assess The Intellectual Skills.	
b- Schedule:	Assessment 1	7 th Week Written Exam
	Assessment 2	12 th Week Written Exam
	Assessment 3	Continuous Assessments
	Assessment 4	16 th Week Final Written Exam
c- Weighing of Assessment	7 th Week Examination	30 %
	12 th Week Examination	20 %
	Final-term Examination	40 %
	Oral Examination	00 %
	Practical Examination	00 %
	Semester Work	10 %
	Total	100%

8- List of References:

a- Course Notes	N/A
b- Required Books (Textbooks)	• Mark Weiss, <i>Data structures and algorithm analysis</i> , 2 nd edition, Benjamin Cummings, 1994.
c- Recommended Books	
d- Periodicals, Web Sites, etc.	N/A

Course Instructor:
Prof.Dr. Yasser El Sonbaty

Program Manager:
Prof. Dr. Mohamad AbouEI-Nasr

Dean of College of Engineering and Technology of AASTMT
Name: Prof. Moustafa Hussein Aly
Signature:

Executive Manager of Quality Assurance Center of AASTMT
Name: Prof. Aziz Ezzat
Signature: