



**University/Academy:** Arab Academy for Science and Technology & Maritime Transport  
**Faculty/Institute:** College of Computing and Information Technology  
**Program:** Computer Science

**Form No. (12)**  
**Course Specification**

**1- Course Data**

<b>Course Code:</b> CS212	<b>Course Title:</b> Data Structure and Algorithms	<b>Academic Year/Level:</b> Year 2 / Semester 4
<b>Specialization:</b>	<b>No. of Instructional Units:</b> 2 hrs lecture 2 hrs lab	<b>Lecture:</b>

<b>2- Course Aim</b>	This course covers the organization of data and the algorithms that act upon them. The topics of linked lists, stacks, queues, trees and graphs as well as hashing are introduced. Applications to data structure searching and sorting, memory allocation and file management are included.
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**3- Intended Learning Outcome:**

<b>a- Knowledge and Understanding</b>	<b>Students will be able to demonstrate knowledge of:</b> <b>K3.</b> Tools, practices and methodologies used in the specification, design, implementation and evaluation of computer software systems. <b>K13.</b> Use high-level programming languages. <b>K15.</b> Interpret and analyzing data qualitatively and/or quantitatively.
<b>b- Intellectual Skills</b>	<b><u>By the end of the course, the student acquires high skills and an ability to understand:</u></b> <b>I3.</b> Identify criteria to measure and interpret the appropriateness of a computer system for its current deployment and future evolution. <b>I4.</b> Analyze, propose and evaluate alternative computer systems and processes taking into account limitations, and quality constraints. <b>I6.</b> Evaluate the results of tests to investigate the functionality of computer systems. <b>I10.</b> Define traditional and nontraditional problems, set goals towards solving them, and. observe results. <b>I11.</b> Perform comparisons between (algorithms, methods, techniques...etc). <b>I12.</b> Perform classifications of (data, results, methods, techniques, algorithms.. etc.). <b>I17.</b> Identify a range of solutions and critically evaluate and justify proposed design solutions.

<b>c- Professional Skills</b>	<p><b><u>By the end of the course the student will have the ability to:</u></b></p> <p><b>P2.</b> Implement comprehensive computing knowledge and skills in projects and in deployment of computers to solve position practical problems.</p> <p><b>P3.</b> Deploy the equipment and tools used for the construction, maintenance and documentation of computer applications.</p> <p><b>P9.</b> Use appropriate programming languages, web-based systems and tools, design methodologies, and knowledge and database systems.</p> <p><b>P14.</b> Specify, design, and implement computer-based systems.</p>																		
<b>d- General Skills</b>	<p><b>Students will be able to:</b></p> <p><b>G1.</b> Demonstrate the ability to make use of a range of learning resources and to manage one's own learning.</p> <p><b>G3.</b> Show the use of information-retrieval.</p> <p><b>G7.</b> Show the use of general computing facilities.</p>																		
<b>4- Course Content</b>	<table border="1" data-bbox="507 674 1177 1059"> <thead> <tr> <th>#</th> <th>CLO</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Revise concepts of Arrays, Structs, and Pointers</td> </tr> <tr> <td>2</td> <td>Linked List</td> </tr> <tr> <td>3</td> <td>Stacks</td> </tr> <tr> <td>4</td> <td>Queues</td> </tr> <tr> <td>5</td> <td>Hashing</td> </tr> <tr> <td>6</td> <td>Trees ( BST, AVL trees, Heaps,..)</td> </tr> <tr> <td>7</td> <td>Graphs</td> </tr> <tr> <td>8</td> <td>Searching and Sorting techniques</td> </tr> </tbody> </table>	#	CLO	1	Revise concepts of Arrays, Structs, and Pointers	2	Linked List	3	Stacks	4	Queues	5	Hashing	6	Trees ( BST, AVL trees, Heaps,..)	7	Graphs	8	Searching and Sorting techniques
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<b>5- Teaching and Learning Methods</b>	Lectures, Labs, Projects.																		
<b>6- Teaching and Learning Methods for Students with Special Needs</b>	Students requesting classroom accommodation must first register with the Dean of Students Office. The Dean of Students Office will provide documentation to the student who must then provide this documentation to the course coordinator when requesting accommodation.																		
<b>7- Student Assessment:</b>																			
<b>a- Procedures used:</b>	Exams and Individual Projects																		
<b>b- Schedule:</b>	Week 7 exam 4 Projects through the semester Week 16 Final exam																		

<b>c- Weighing of Assessment:</b>	7 <sup>th</sup> week exam 30% Project 1 5% Project 2 5% Project 3 5% Project 4 5% Lab work 10% Final exam 40%
<b>8- List of References:</b>	
<b>a- Course Notes</b>	From the Moodle on <a href="http://www.aast.edu">www.aast.edu</a>
<b>b- Required Books (Textbooks)</b>	"Data Structures and Algorithm Analysis in C++", 3 <sup>rd</sup> edition , by Mark Allen Weiss
<b>c- Recommended Books</b>	Adam Drozdek, <i>Data Structures and Algorithms in C++</i> , Course Technology, 3rd edition 2004
<b>d- Periodicals, Web Sites, ..., etc.</b>	

**Course Instructor:**

**Head of Department:**

**Sign**

**Sign**