	Ministry of Higher Education and Scientific Research - Iraq University of Technology Department of Computer Science	

MODULE DESCRIPTOR
وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	DATA STRUCTURES			**Module Delivery**	
Module Type	BASIC			**Theory** **Lecture** **Lab** **Tutorial** **Practical** **Seminar**	
Module Code	DAST212				
ECTS Credits	5				
SWL (hr/sem)	125				
Module Level	2		**Semester of Delivery**	3	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader			**e-mail**		
Module Leader's Acad. Title	Assist Prof.		**Module Leader's Qualification**	Ph.D.	
Module Tutor	None		**e-mail**	None	
Peer Reviewer Name			**e-mail**		
Review Committee Approval			**Version Number**		

Relation With Other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	None
Co-requisites module	Sorting and Searching Algorithms	**Semester**	4
Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية			
Module Aims أهداف المادة الدراسية	• Getting to know the concept of data structures • Knowing the functions of data structures • Getting to know the applications of data structures		
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1-Understand the fundamental concepts of data structures and their importance in programming. 2-Learn about linear data structures, such as arrays, linked lists, stacks, and queues. 3-Study non-linear data structures, including trees (binary trees, binary search trees, AVL trees, etc.) and graphs. 4-Analyze the time and space complexities of various data structure operations. 5-Implement data structures using programming languages and apply them to solve real-world problems. 6-Learn about algorithms for searching, sorting, and traversing data structures.		
Indicative Contents المحتويات الإرشادية	Introduction of data structure, Type of data structure, Memory representetionforD1 and D2, Linear list &types, Stack operations, Application of stack, Queue operations, Applications of Queue, Circular Queue, Linked list, Linked Stack, Linked Queue		
Learning and Teaching Strategies استراتيجيات التعلم والتعليم			
Strategies	Lectures (Theoretical and Practical) 1-Enhance the student's ability to build programs 2-Develop these programs		

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	78	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	47	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 2, 3 and 6
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 5 and 6
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 4, 5 and 6
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-6
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to Data Structures: - How to choose the suitable data structure - Types of data structures
Week 2	Memory Representation - Introduction to Abstract Data Type
Week 3	Stack The Stack Abstract Data Type - Array Stack - Stack Operations - Time Complexity of these operations
Week 4	Applications of stack **operations**
Week 5	The Queue Abstract Data Type - Queue operations - Time Complexity of **operations**
Week 6	Circular Queue and Priority Queues:

	- The Abstract Data Type - Operations
Week 7	Lists : - Array list - The array List Abstract Data Type
Week 8	**Lists :** **- Array list** **- The array List Abstract Data Type**
Week 9	Linked List - Storage Allocation - Pointers - Linked List Abstract Data Type
Week 10	Traversing a Linked List - Linked List Operations
Week 11	Linked List Design Modification : - Circular Linked List - Circular Linked List Operations
Week 12	Traversing Circular Linked List
Week 13	Linked List Design Modification : - Doubly Linked List - Doubly Linked List Operations
Week 14	Linked Stack , Linked Queue , Linked Circular
Week 15	**Queue** **- Operations**
Week 16	**Queue** **- Operations**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Applications of stack **operations**
Week 2	The Queue Abstract Data Type - Queue operations - Time Complexity of **operations**
Week 3	Circular Queue and Priority Queues: - The Abstract Data Type - Operations
Week 4	Lists : - Array list - The array List Abstract Data Type
Week 5	**Lists :** **- Array list**

	- The array List Abstract Data Type
Week 6	Linked List - Storage Allocation - Pointers - Linked List Abstract Data Type
Week 7	Traversing a Linked List - Linked List Operations
Week 8	Linked List Design Modification : - Circular Linked List - Circular Linked List Operations
Week 9	Traversing Circular Linked List
Week 10	Linked List Design Modification : - Doubly Linked List - Doubly Linked List Operations
Week 11	Linked Stack , Linked Queue , Linked Circular
Week 12	**Queue** **- Operations**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	[1]: MICHAEL McMillan. Title :" Data Structures and Algorithms Using C#" , 2007 [2]: Thomas H. Cormen , CHARLES E. LEISERSON Title :"Introduction to Algorithms ", third edition ,2009	Yes
Recommended Texts	Special requirements (include for example workshops, periodicals, IT software, websites)	No
Websites		

APPENDIX:

GRADING SCHEME مخطط الدرجات				
Group	**Grade**	التقدير	**Marks (%)**	**Definition**
Success Group (50 - 100)	**A -** Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings

	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX** – Fail	مقبول بقرار	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note:

NB Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.