Northern Technical University
Institute of Management - Nineveh
Department of Computer Systems Technologies

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Data Structure**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☐ **Lecture** ☐ **Lab** ☐ **Tutorial** ☒ **Practical** ☐ **Seminar**	
Module Code	**CST201**				
ECTS Credits	**CST100**				
SWL (hr/sem)	**60**				
Module Level	2		**Semester of Delivery**	1	
Administering Department			**College**	Computer Systems Department	
Module Leader	Aamer Tahseen Suhail		**e-mail**	aamir@ntu.edu.iq	
Module Leader's Acad. Title	Lecturer		**Module Leader's Qualification**	Master's degree in Computer Science	
Module Tutor			**e-mail**		
Peer Reviewer Name			**e-mail**	E-mail	
Scientific Committee Approval Date	09/04/2024		**Version Number**	1.0	

Relation with other Modules العالقة مع المواد الدراسية الاخرى			
Prerequisite module	C++ Language	**Semester**	1
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents اهداف المادة الدراسية ونتائج التعلم	
Module Aims	1. The D.S. is one of the most important module in the computer science, and is commonly used in many fields of computer science as designing of computer system software, structural SW and system
Module Learning Outcomes	Understand the principles of the Data Structure. Implementing and writing procedures and Functions of system and applications
Indicative Contents	Data Structure: How to obtain outputs from the system programs , how to write procedures and function of arrays memory allocations, stacks and queue operations, linked lists, tree and graph applications

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Intermediate level: making it ideal for performing systems programming. Simple: Simple in content, can be divided into parts, and provides many types of data. Independent: It can run on different operating systems regardless of its parts.

Student Workload (SWL)			
Structured SWL (h/sem)	15	**Structured SWL (h/w)**	4
Unstructured SWL (h/sem)	-	**Unstructured SWL (h/w)**	
Total SWL (h/sem)	60		

Module Evaluation

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	4	20% (20)		LO #1, 2, 5 and 6
	Assignments	2	20% (20)		LO # 2, 4, 5and 6
Summative assessment	**Midterm Exam**	2hr	10% (10)		LO # 1-8
	Final Exam	3hr	50% (50)		All
Total assessment			100% (100 Marks)		

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	قيد المعالجة	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

المستوى الدراسي الثاني / الفصل الاول

وصف مقرر هياكل البيانات Data Structure

رمز المقرر	اسم المقرر	نوع المقرر	المستوى والفصل	الساعات النظرية	الساعات العملية	الوحدات	الممهد
CST201	هياكل البيانات	متطلب قسم/ اجباري	مستوى ٢ فصل ١	٢	٢	٣	CST100

اهداف المقرر:
تعريف الطالب بمعنى الهيكل البياني وأنواع الهياكل البيانية وأهميتها و خصائصها وتطبيقاتها المتوفرة مع بيان مميزات البرمجة المهيكلة و كفاءتها مقارنة مع البرمجة التقليدية،

ملاحظة:- تستخدم لغة C^{++} في الأيعازات البرمجية والتعامل مع الملفات

اساليب التقييم:
الاختبارات النظرية – اختبارات قصيرة –اعمال المختبر -اختبارعملي -عرض تقديمي لمشروع صغيرلكل مجموعة – تصحيح الواجبات.

تفاصيل المادة:

تفاصيل المفردات	الأسبوع
• definition of data structures • data structure types Primitive data structures representation. • Integer. • Real . • Characters . • Strings . • Pointers . • Logical Data	الأول
Compound Data Structures . • Arrays. • Array represent. • represent One dimensional array in memory • represent two dimensional array in memory. • Rows method. • Column method. Pointers. • Pointer definitions. • Memory/ allocate memory to pointer and editing • Pointers advantages and characteristic. • Pointers and array/ arrays of pointers and pointer to array • Pointer as address • Pointer comparison • Pointers of pointers • Function pointers	الثاني والثالث

Stack. Array representation of stack linked stack. Stack operations algorithms, Stack applicati	الرابع
• Queue Represent queue using matrix linked queue queue applications • circle queue	الخامس والسادس
Linked list: • Linked list definitions • Linked list types, and represent ways. • Simple list/ reading items – print list- insert item in (front, determine locations, back) of list	السابع والثامن
1. Circle list/ reading items- print list	التاسع والعاشر
• non-linear data structures • graphs. • graphs types • graphs representation. Trees • trees types ., trees representation., trees traversing methods . • Convert general tree to binary,-trees applications	الحادي عشر - الثالث عشر

• sorting and searching . • sorting algorithms . • selection sort ,bubble sort.,quick sort. • searching algorithms. • sequential search • binary search. • files structures	الرابع عشر و الخامس عشر