

	Ministry of Higher Education and Scientific Research - Iraq Al-Naji University College of Engineering Department of Cybersecurity Engineering	
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MODULE DESCRIPTOR FORM

نموذج وصف المادة الدراسية

Module Information					
معلومات المادة الدراسية					
Module Title	COMPUTER PROGRAMMING			Module Delivery	
Module Type	Core			☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	CSE1206				
ECTS Credits	6				
SWL (hr/sem)	150				
Module Level	UG I	Semester of Delivery	2		
Administering Department	CSE	College	7294		
Module Leader	Dr. Loai Alamro		e-mail	loai.alamro@alnaji-uni.edu.iq	
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	PhD		
Module Tutor		e-mail	None		
Peer Reviewer Name		e-mail			
Review Committee Approval	02/06/2023	Version Number	1.0		

Relation With Other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module		Semester	
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. To understand what a computer language is. 2. To understand how algorithms are made. 3. To understand loops and program structure and decisions. 4. Learn about Arrays, declaration, accessing, storing variables and operations on arrays. 5. Learn about functions, passing values and returning values from a function. 6. Learn about Internet routing designs. 7. Learn about computer memory, pointers declaration., Generic Pointers, Passing Arguments to Functions using Pointer and Pointer and Arrays.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. To understand what a computer language is. 2. To understand how algorithms are made. 3. To understand loops and program structure and decisions. 4. Learn about Arrays, declaration, accessing, storing variables and operations on arrays. 5. Learn about functions, passing values and returning values from a function. 6. Learn about Internet routing designs. 7. Learn about computer memory, pointers declaration., Generic Pointers, Passing Arguments to Functions using Pointer and Pointer and Arrays.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Part-A [10 Hrs] The language of computer, programming methodology: structural programming, ANSI/ISO standard C++. Part-B [20 Hrs] Algorithms: Algorithm design & Flow Charts. Case study. The Basic Structure of program language, Using I/O statements, Variables, Operators Loops: for, while, do while loop. Part-C [15 Hrs] Decisions: if statement, if-else statement, else-if construct, switch statement, Conditional operator Array – Declaration of Arrays – Accessing elements of the Array – Storing

	Values in Array – Calculating the length of the Array – Operations on Array – one dimensional array for inter-function communication – Two dimensional Arrays –Operations on Two Dimensional Arrays Part-D [15 hrs] Functions: Simple Functions, Functions that return a value, using arguments to pass data to a function, using more than one functions, External variables, Preprocessor directives. Strings: Introduction String and Character functions Part-E [9] Pointers: Understanding Computer Memory – Introduction to Pointers – declaring Pointer Variables – Pointer Expressions and Pointer Arithmetic Part-F [9] Null Pointers – Generic Pointers - Passing Arguments to Functions using Pointer – Pointer and Arrays – Passing Array to Function.
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Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.
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Student Workload (SWL)

الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	77	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	73	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
1	The language of computer, programming methodology: structural programming, ANSI/ISO standard C++.
2,3	Algorithms: Algorithm design & Flow Charts.
4	Algorithms: Case study
5	The Basic Structure of program language, Using I/O statements, Variables, Operators
6,7	Loops: for, while, do while loop.
8,9	Decisions: if statement, if-else statement, else-if construct, switch statement, Conditional operator
10,11	Array – Declaration of Arrays – Accessing elements of the Array – Storing Values in Array – Calculating the length of the Array – Operations on Array – one dimensional array for inter-function communication – Two dimensional Arrays –Operations on Two Dimensional Arrays
12,13	Functions: Simple Functions, Functions that return a value, using arguments to pass data to a function, using more than one functions, External variables, Preprocessor directives. Strings: Introduction String and Character functions
14	Pointers: Understanding Computer Memory – Introduction to Pointers – declaring Pointer Variables – Pointer Expressions and Pointer Arithmetic – Null Pointers – Generic Pointers - Passing Arguments to Functions using Pointer – Pointer and Arrays – Passing Array to Function.
15	Exams
16	Final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Weeks	Lab sessions
	Assignment 1 & 2/ Flowchart and Algorithms
	Problem1: Now there are various flowcharts samples in this assignment that is required to understand the concept of design the algorithms and flowchart. Task: Do the following for each sample, 1. Estimate the output result. 2. Write an algorithm that represents the flowchart sample. Problem2: There are several algorithm samples in this assignment that is required to understand the concept of design the algorithm and flowchart. Task: Do the following for each sample, Design a flowchart that represents the algorithm sample statements.
	Assignment 3/ Arithmetic Operation & Conditional Statements
	Problem1: Suppose there are three input variables x,y, and z. where x is integer and the reset are float. Task: Write a program that find the result of F for each of the following: 1. Find the value of $F(x,y) = \sqrt{x^2 + 2y }$ 2. Find the value of $F(z,y,z)$, $F(z,y,z) = \begin{cases} x^2 + 2y - 1 & , \text{ where } y \text{ is positive and } x \text{ is smaller than } 5. \\ x^2 + y & , \text{ where } y \text{ is negative and } x \text{ is greater than } -5 \\ \frac{x}{2} & , \text{ where } x > 5 \text{ or } x < -5 \\ z & , \text{ otherwise} \end{cases}$ Problem2: Ahmed has two sons. His friend Zaki wants to know the ages of his sons. Ahmed gives him three hints; the sum of their ages is equal to my house number and the product of their ages is 15. While one of them is twice age than his borther. Task: Do the following 1. Draw a flowchart to find ages of sons. Write a program that represents the flowchart to get the output result.
	Assignment 4/ loops
	Problem1: Suppose you have the input variable x and n, where each one of them is integer. Then find and print the value of F(x) where $F(X) = \sum_{i=0}^n X^i / i!$ Task: Do the following: 1. Draw a flowchart that solves the above problem. 2. Write a program that implements the flowchart steps and print the result. Suppose now that n is unknown and repeating the evaluation of F(x) until the result is greater than 99.7
	Assignment 5/ Array & Function
	Problem1: Suppose the user input the decimal number X for n times. For each number do the following: a. Convert the decimal number to binary number b. Convert the decimal number to octal number c. Convert the octal number to decimal number

	d. Convert the binary number to octal number e. Convert the octal number to binary number. Task: Do the following: 1. Write an algorithm steps for each one. Write a program that implement the algorithm steps via building function for each one of (a,b,...e).
	Assignment 6/Matrix
	Problem1: Given a 2-D array of size N x M named X. The user need to implement various method on X. a. Searching for F value in matrix A based on row-major order and column-major order sequentially. b. Check type of input matrix X whether it is Diagonal, Identity, or lower triangular. c. Check whether a matrix X is Mirror matrix or not. Task: Do the following: 1. Write an algorithm for each of a, b and c above. 2. Write a program that implements the three algorithms to get the outputs. Problem2: Suppose there are n student each has 5 subjects. Store these subjects information in matrix. Task: Write a program to do the following: a. Find the average mark for each subject for all students. b. Find the total number of fail student with more than one subject. c. Sorting the student record based on its average. d. Find how many students are pass with grade A based on its average. e. Convert the subject marks into grades for example 95→A Check if there is at least one of the fail student with less than 4 subject van be pass with the increment 5 marks.
	Assignment 7/ String
	Problem1: Suppose the is an input string ST and need to do variable checking for this string: a. Check how many character X is repeated. b. Find the total number of words in the input string. c. Check if the input is palindrome or not. d. Find how many vowel characters are found in ST. e. Inverse the string ST and print the new one. Task: Write a program to implement the above requirements from (a,b,..e) and building a function for each one.

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts		No

	Book#1: William Stallings , Computer organization and architecture designing for performance, Prentice Hall, 2010. Book#1: D.S. Malik , C++ Programming: From problem analysis to program design, 8 th Edition, Thomson 2017	
Supporting Texts	Reference#1 Paul Deitel and Harvey Deitel , 'C++ How to program', 8th Edition, Prentice Hall Reference#2 Bjarne Stroustrup The C++ Programming Language, 3rd Edition, by AT&T 1997.	No
Websites	https://mdl.coie-nahrain.edu.iq	

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.				

