Module Information
معلومات المادة الدراسية

Module Title	**Programming Fundamentals**	**Module Delivery**	
Module Type	**B**	☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**CSI111**		
ECTS Credits	**8**		
SWL (hr/sem)	**200**		
Module Level	1	**Semester of Delivery**	1
Administering Department	CS	**College**	CSI
Module Leader	Nisreen Riyadh	**e-mail**	
Module Leader's Acad. Title	Lecturer	**Module Leader's Qualification**	Master
Module Tutor		**e-mail**	
Peer Reviewer Name	Zainab Fahd	**e-mail**	
Scientific Committee Approval Date	01/06/2023	**Version Number**	1.0

Relation with other Modules
العلاقة مع المواد الدراسية الأخرى

Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	1. This course aims to provide students with an overview of programming languages. 2. Enable the student to design algorithms and flowcharts to solve and develop programming issues. 3. Learning and understanding basic concepts and methods of structured programming using C++. 4. Enable the student from converting algorithms /flowcharts into an executable program on the computer. 5. Enable the student to use control Statements.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Understand the programming and programming languages. 2. Understand the algorithms. 3. Learn how to write algorithms and flowcharts. 4. Learn how to analyze problems, find appropriate solutions, and develop correct algorithms that contribute to solving these problems. 5. Learn how to write simple programs. 6. Learn how to convert the algorithm into a program. 7. Understanding the Control statements, and learn how to use them in the programs.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A:</u> • Programming and programming languages. • Algorithms and Flowcharts. • C++ Basics. <u>Part B:</u> • Selection Statements. • If and IF Else statements. • Switch – case statements. <u>Part C:</u> • Looping Statements • While Statement • Do – While Statement • For statement

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	In this course, the student learned the basics of programming through theoretical lectures and practical application in the laboratory, in addition to daily assignments and daily tests, asking some questions and using the brainstorming method.

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	136	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	9.1
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**200**		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	5% (5)	5 and 10	LO #1, #2 and #10, #11
	Assignments	1	5% (5)	3, 5 and 8 and 9	LO #3, #4 and #6, #7
	Projects / Lab.	15	20% (20)	Continuous	All
	Report	1	5% (5)	Continuous	All
Summative assessment	**Midterm Exam**	2hr	15% (15)	12	LO #1 - #7
	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 Programming • Defining the programming, programming language, Levels of programming languages. • Steps to solve the problems.
Week 2	Algorithms • Defining the algorithms. • Algorithm properties. • Flowcharts. • Writing a simple algorithm.
Week 3	More about algorithms • More examples on algorithms
Week 4	Introduction to C++ language • C++ languages basics. • Write a simple program. • Converting algorithms to programs.
Week 5	C++ basics • Keywords and Identifier. • Data types. • Variables and their Declarations. • Variable initialization. • Variable scope.
Week 6	More about C++ basics • Arithmetic operation. • Operation order.

	• Comparison and logic operations.
Week 7	More about C++ basics • Unary operators • Increment and decrement operators. • Characters and Literal in C++. • Objects, variables and constants.
Week 8	Control Statements Selection Statements • Selection Statement (IF statement) • Examples on If statements.
Week 9	More about selection Statements • If – else Statement • Examples on if – else statement.
Week 10	More about selection Statements • Switch case statement. • Examples on switch - case statement.
Week 11	Control Statements Looping Statements • While statement • Examples on while statements.
Week 12	More about Looping statements • Do –while Statement • Examples on Do – while statement.
Week 13	More about Looping statements. • For Statement • Examples on for statement.
Week 14	Control Statements.

	• Jumping statements (break and continue) • Examples on break and continue.
Week 15	Comprehensive review of the course

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Introduction to C++ language editor (editor interface, menu, how to run and check program)
Week 2	Writing a simple program
Week 3	Writing more programs
Week 4	Writing more simple programs
Week 5	Performing the arithmetic and logic programs
Week 6	Perform the unary operator examples.
Week 7	Perform the increments and decrement operations.
Week 8	Perform the if statement examples
Week 9	Perform the if – else examples
Week 10	Perform the switch case examples
Week 11	Perform the while examples
Week 12	Perform the do – while examples
Week 13	Perform the for statements examples
Week 14	Perform the break and continue examples
Week 15	Comprehensive review of the course

Learning and Teaching Resources

مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	• C++: How To Program, Deitel and Deitel, 4th edition, Pren ce Hall, 2002. • Programming in C, Stephen Kochan, 3rd edi on, Sams, 2004. • The C Programming Language, Brian W. Kernighan and Dennis M. Ritchie, 2nd edition, Prentice Hall, 1988.	No
Recommended Texts	• C Programming: A Complete Guide to Mastering the C Language, Augie Hansen and August Hansen, Addison-Wesley, 1989.	No
Websites	https://www.coursera.org/courses?query=c%20plus%20plus	

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

Note: Marks 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.

Module Information معلومات المادة الدراسية					
Module Title	**Introduction to Information Technology**			**Module Delivery**	
Module Type	B			☒ **Theory** ☒ **Lecture** ☐ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	CS111				
ECTS Credits	**4**				
SWL (hr/sem)	**100**				
Module Level	1		**Semester of Delivery**	1	
Administering Department	CS		**College**	CSI	
Module Leader	Zainab Fahd		**e-mail**		
Module Leader's Acad. Title	Lecturer		**Module Leader's Qualification**	Master	
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Nisreen Riyadh		**e-mail**		
Scientific Committee Approval Date			**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	1. Learn the Components of a computer system 2. HARDWARE which includes (CPU, Control Unit, Arithmetic Logic Unit (ALU), Registers, Network devices, Memory primary, secondary storage, and Memory Capacity 3. The software which includes the Operating system and Applications Software (Word processing, Spreadsheets, Databases Presentation, Accounts / Payroll, Web browsing, Web authoring ,and a multimedia application. 4. This course also gives the details for the Types of Networks (LAN, (MAN) Metropolitan area Networks, WAN and the Categories of Networks such as (Peer-to-Peer Networks and Server-Based Networks) 5. Uses computer applications in business, within government, hospitals (the health care system) and in education. 6. Acquires a variety of IT-related information that will be useful to him/ / her in
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Know and learn the general term of Information technology(IT): and to know the difference between Information System and Data, Information, Knowledge. 2. Know the knowledge about the Computer–Based Information System and the Computer Hierarchy 3. Understand the complete description for the HARDWARE 4. Know the complete description for the SOFTWARE **5. Understand the Main Parts of a Computer** 6. Learn the Programming language(Machine Language, Second-generation languages(Assembly) and also **know the High-level language which includes (**Procedural language, Nonprocedural languages and Natural languages (Visual programming languages and object-oriented programming languages)) 7. Know the description of Computer Network and the Types of Networks: 8. The knowledge about the Internet
Indicative Contents المحتويات الإرشادية	This course covers the basic concepts of computers and information technology including introduction, hardware, software, memory, input/output, data representation, database, networks and data communication, Internet, multimedia, and computer security.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	This course provides general idea to the Information Technology (IT) that relates to the use of computers as an aid in creating and maintaining data. IT is related to all aspects of managing and processing information, especially within a large organization.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	32	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	68	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**100**		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	10% (10)	5 and 10	LO #1- #2 and #3- #4 and #5- #6 and #7-8 and #9- #11
	Assignments	1	5% (5)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.				
	Report	1	5% (5)	10	LO #5, #8 and #10
Summative assessment	**Midterm Exam**	2hr	30% (30)	7	LO #1 - #7
	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 Computer Introduction; Digital and Analog Computers; Characteristics of Computer; History of Computer; Generations of Computer; Classification of Computer; The Computer System; Application of Computers
Week 2	Information Technology (IT) Definitions of the term Information Technology (IT) Why study IT ?, How the H/W work in an IT? IT tools?
Week 3	The Computer System Hardware Introduction; Central Processing Unit; Memory Unit; Instruction Format; Instruction Set; Instruction Cycle; Microprocessor; Interconnecting the Units of a Computer; Inside a Computer Cabinet.
Week 4	Computer Memory Introduction; Memory Representation; Memory Hierarchy; CPU Registers; Cache Memory; Primary Memory; Secondary Memory; Access Types of Storage Devices; Magnetic Tape; Magnetic Disk; Optical Disk; Magneto-Optieal Disk; How the Computer uses its memory
Week 5	Input and Output Devices Introduction; Input-Output Unit; Input Devices; Human Data Entry Devices; Source Data Entry Devices; Output Devices; I/O Port; Working of I/O System
Week 6	Data Representation Introduction; Number System; Conversion from Decimal to Binary, Octal, Hexadecimal; Conversion of Binary, Octal, Hexadecimal to Decimal; Conversion of Binary to Octal, Hexadecimal; Conversion of Octal, Hexadecimal to Binary; Binary Arithmetic; Signed and Unsigned Numbers; Binary Data Representation; Binary Coding Schemes; Logic Gates
Week 7	**Mid-term Exam**

Week 8	Computer Software Introduction; Types of Software; System Software; Application Software; Software Acquisition; Operating System (Introduction, Objectives of Operating System, Types of OS, Functions of OS, Process Management, Memory Management, File Management, Device Management, Protection and Security, User Interface, Examples of Operating Systems)
Week 9	Data Communication and Computer Network Introduction; Importance of Networking; Data Transmission Media; Data Transmission across Media; Data Transmission and Data Networking; Computer Network; Network Types; Network Topology; Communication Protocol; Network Devices; Wireless Networking
Week 10	The Internet and Internet Services Introduction; History of Intemet; Internetworking Protocol; The Internet Architecture; Managing the Intemet; Connecting to Intemet; Internet Connections; Internet Address; Internet Services; Uses of Intemet; Introduction to Internet of Things (IOT), Wearable Computing, and Cloud Computing, Introduction to E-commerce, E-governance, and Smart City, and GIS
Week 11	Fundamentals of Database Introduction; Database; Database System; Database Management System; Database System Architectures; Database Applications; Introduction to Data Warehousing, Data mining, and BigData
Week 12	Multimedia Introduction; Multimedia - Definition; Characteristics of Multimedia; Elements of Multimedia; Multimedia Applications
Week 13	Computer Security Introduction; Security Threat and Security Attack; Malicious Software; Security Services;
Week 14	Computer Security Security Mechanisms (Cryptography, Digital Signature, Firewall, Users Identification and Authentication, Intrusion Detection Systems); Security Awareness; Security Policy
Week 15	**Final Exam**

Learning and Teaching Resources

مصادر التعلم والتدريس

		Available in the Library?
Required Texts	*1-"**Basic Concepts of Information and Communication Technology, notes",*** Dario Ilija Rendulić , 2011. ***2- "Computational Science: Ensuring America's Competitiveness",*** Marc R. Benioff Edw and Lazowska , 2005. ***3- Basic Concepts Of Information Technology (IT),*** Dheeraj Mehrotra, • ***Introduction to Information Technology—Hardware, Software, and Telecommunications,*** Information Technology for the Health Professions, Third Edition, by Lillian Burke and Barbara Weill. Published by Prentice Hall. Copyright © 2009 • *1-"**Basic Concepts of Information and Communication Technology, notes",*** Dario Ilija Rendulić , 2011. • ***"Computational Science: Ensuring America's Competitiveness",*** Marc R. Benioff Edw and Lazowska , 2005. 1- ***Basic Concepts Of Information Technology (IT),*** Dheeraj Mehrotra, 2- ***introduction to Information Technology—Hardware, Software, and Telecommunications,*** Information Technology for the Health Professions, Third Edition, by Lillian Burke and Barbara Weill. Published by Prentice Hall. Copyright © 2009 3- ***Collection of papers in IT from the internet.***	Yes
Recommended Texts		No
Websites		

Grading Scheme مخطط الدرجات				
Group	**Grade**	التقدير	**Marks %**	**Definition**
Success Group	**A -** Excellent	امتياز	90 - 100	Outstanding Performance

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

Note: Marks 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.

Module Information
معلومات المادة الدراسية

Module Title	**Logic Design**			**Module Delivery**	
Module Type	**Basic**			☒ **Theory**	
Module Code	**CS112**			☒ **Lecture**	
ECTS Credits	**6**			☒ **Lab**	
SWL (hr/sem)	**150**			☐ **Tutorial**	
				☐ **Practical**	
				☐ **Seminar**	
Module Level	1		**Semester of Delivery**	1	
Administering Department	CS		**College**	CSI	
Module Leader	Qusai Omran Musa		**e-mail**	qusay.mosa@qu.edu.iq	
Module Leader's Acad. Title	Assist. Prof.		**Module Leader's Qualification**	Ph.D.	
Module Tutor			**e-mail**		

Peer Reviewer Name	Mohammad Iqbal	**e-mail**	Mohammed.iqbal@qu.edu.iq
Scientific Committee Approval Date	01/06/2023	**Version Number**	1.0

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	None	**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 develop problem solving skills and understanding of logic design theory through the application of techniques. 2. This course deals with the basic concept of electrical circuits. 3. To understand Counting systems, codes, and conversion between different numerical systems. 4. To understand foundations and laws of the algebraic general. 5. To understand abbreviation of logical functions using Karnaugh map 6. To understand all seven logic gates and the truth table of each gate. 7. The ability to analyze electronic circuits.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Identify the binary, decimal, octal, and hexadecimal number systems, and learn about conversion methods between these systems. 2. Learn about the foundations and laws of Boolean algebra. 3. Learn about the logic gate. 4. Learn about the Karnaugh map. 5. Learn about cascade circuit analysis such as flip-flop and recorders. 6. Having the ability to design electronic circuits.
Indicative Contents	Indicative content includes the following. 1. Introduction to Logic Systems:

المحتويات الإرشادية	• Overview of digital logic systems • Binary representation and number systems • Logic levels: HIGH and LOW • Basic logic operations: AND, OR, NOT 2. Boolean Algebra: • Boolean variables and expressions • Laws and theorems of Boolean algebra • Simplification of Boolean expressions • De Morgan's theorem • Boolean functions and truth tables 3. Logic Gates: • Introduction to logic gates • Basic logic gates: AND, OR, NOT • Universal gates: NAND, NOR • XOR and XNOR gates • Gate-level implementation of Boolean functions 4. Combinational Logic Design: • Combinational logic circuits • Designing combinational circuits using logic gates • Half-adder and full-adder circuits • Multiplexers and demultiplexers • Encoders and decoders 5. Sequential Logic Design: • Introduction to sequential logic circuits • Flip-flops: SR, D, JK, T • Latches and registers • Designing sequential circuits using flip-flops • Counters and shift registers

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.

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	86	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	7
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	5% (5)	5, 10	LO #1, 2, 10 and 11
	Assignments	1	5% (5)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	15	20% (20)	Continuous	All
	Report	1	5% (5)	13	LO # 5, 8 and 10

Summative assessment	**Midterm Exam**	2 hr	15% (15)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Number systems
Week 2	Binary number systems
Week 3	Octal number systems
Week 4	Hexadecimal number systems
Week 5	Arithmetic operation on numbering systems
Week 6	Logic gates (AND, OR, NOT)
Week 7	Logic gates (NAND, NOR XOR, & XNOR)
Week 8	Simplification and Boolean function
Week 9	Simplification and Boolean function
Week 10	Karnaugh map
Week 11	Karnaugh map
Week 12	Logic operations
Week 13	Combinational and sequential analysis and design
Week 14	Combinational and sequential analysis and design
Week 15	Digital circuit design optimization methods
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Introduction to number system
Week 2	Introduction to number system (Binary , Octal, Hexadecimal)
Week 3	Introduction to logic gates and Multisim simulation application
Week 4	Verification of Truth Tables of Logic gates. (AND, OR, NOT)
Week 5	Verification of Truth Tables of Logic gates. (NAND, NOR)
Week 6	Verification of Truth Tables of Logic gates. (XOR, & XNOR)
Week 7	Transform gates using inverters and implementation of gates from other gates
Week 8	Implementation of Basic gates using Universal Gates.
Week 9	Implementation of the given Boolean Algebra functions using logic gates.
Week 10	Simplification of the given Boolean functions using K-map and implementation using logic gates.
Week 11	Realization and verification of Full adder using logic gates..
Week 12	Realization and verification of Full Subtractor using logic gates.
Week 13	Introduction to sequential circuit
Week 14	Implementation of sequential circuit using logic gates
Week 15	Design Flip-Flops using logic gates

Learning and Teaching Resources

مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	• "Introduction to Logic Design" (2nd) edition), Sajjan G. Shiva, 2007. • Digital Design, Fifth Edition, by M. Morris Mano. Prentice-Hall, Inc. 2012 • Digital Design and Computer Architecture Second Edition, by David Money Harris and Sarah L. Harris. Elsevier Inc. 2013	
Recommended Texts	• Ashkan PASHAMEHR, Mahdi ZAVVARI and Hamed ALIPOURBANAEI. : All-optical AND/OR/NOT logic gates based on photonic crystal ring resonators. Front. Optoelectron. 2016. • J.S.Srinivas Raju, Satish Kumar and L.V.S.S.Sai Sneha. : Realization of Logic Gates Using Mcculloch-Pitts Neuron Model. International Journal of Engineering Trends and Technology (IJETT) – Volume-45 Number2 –March(2017) • G.Nagasundari and R.Prabhakari. : Design of Three-Input XOR/XNOR using Systematic Cell Design Methodology. Asian Journal of Applied Science and Technology (AJAST).(2017).	
Websites	https://www.coursera.org/learn/digital-systems	

Grading Scheme مخطط الدرجات				
Group	**Grade**	التقدير	**Marks (%)**	**Definition**
Success Group (50 - 100)	**A -** Excellent	امتياز	90 - 100	Outstanding Performance
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(0 – 49)	**F –** Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks 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.

Module Information
معلومات المادة الدراسية

Module Title	**حقوق الإنسان**	**Module Delivery**	
Module Type	S	☒ **Theory**	
Module Code	**UNV112**	☒ **Lecture**	
ECTS Credits	**2**	☐ **Lab**	
SWL (hr/sem)	**50**	☐ **Tutorial**	
		☐ **Practical**	
		☐ **Seminar**	

Module Level	1	**Semester of Delivery**	1
Administering Department	CS	**College**	CSI
Module Leader	Nasirallah Galib	**e-mail**	E-mail
Module Leader's Acad. Title	Lecturer	**Module Leader's Qualification**	Ph.D.
Module Tutor	Name (if available)	**e-mail**	E-mail
Peer Reviewer Name	Makarim Kishan	**e-mail**	E-mail
Scientific Committee Approval Date	01/06/2023	**Version Number**	1.0

Relation with other Modules
العلاقة مع المواد الدراسية الأخرى

Prerequisite module	None	**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	تهدف المادة الى تعريف الطلبة بحقوق الإنسان وابرز مصادرها وخصائصها والمراحل التاريخية التي مرت بها حقوق الإنسان, ثم التعرف على الاعلان العالمي لحقوق الإنسان وأبرز المواد التي تضمنها الإعلان ، والمعاهدات والمواثيق الدولية وابرز المنظمات الدولية في مجال حقوق الإنسان وتعريف الطلبة بحقوق الإنسان في الديانات السماوية.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	**أ- الأهداف المعرفية:** 1-إكساب الطلبة المعرفة المتعلقة بحقوق الإنسان. 2-تعريف الطالب بأهمية حقوق الإنسان في الدين الإسلامي الحنيف ودور النبي(ص) في ترسيخها. 3-إكساب الطالب المعرفة الضرورية بالتجارب الإقليمية لحقوق الإنسان. 4-تعريف الطالب بحقوق الإنسان ضمن الدستور العراقي. 5-تعريف الطالب بالحقوق و الواجبات على المستوى الوطني و الدولي. 6-تعريف الطالب بالملكية الفكرية ومايتعلق بها. **ب-الأهداف المهاراتية الخاصة بالمادة:** 1-أن يكتسب الطالب الحس الأخلاقي وربطه بالعمل. 2-أن يكتسب الطالب القدرة والفهم الصحيح لحقوق الإنسان. 3-أن يكتسب الطالب المعرفة الضرورية بالحقوق و الواجبات. ج-الأهداف الوجدانية: 1-تشجيع الطلبة على الاستفادة من مادة حقوق الإنسان عن طريق الإيمان بأهميتها في العملية التعليمية وفي مجال التخصص بشكل عام. 2-تشجيع الطلبة ورفع روح المنافسة بينهم. 3-تعزيز التعاون بين الطلبة عن طريق التطبيق الفعلي في الجانب التطبيقي. 4- تنمية الطاقات الفكرية والإبداعية لدى الطلبة من خلال تنفيذهم لمختلف الواجبات.

Indicative Contents المحتويات الإرشادية	تهدف المادة الى تعريف الطلبة بحقوق الإنسان وابرز مصادرها وخصائصها والمراحل التاريخية التي مرت بها حقوق الإنسان, ثم التعرف على الاعلان العالمي لحقوق الإنسان وأبرز المواد التي تضمنها الإعلان ، والمعاهدات والمواثيق الدولية وابرز المنظمات الدولية في مجال حقوق الإنسان وتعريف الطلبة بحقوق الإنسان في الديانات السماوية.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	**أ-طرائق التعليم والتعلم** 1.إلقاء المحاضرات العلمية في القاعات الدراسية. 2.إرشاد الطلاب إلى بعض المواقع الإلكترونية للإفادة منها. 3.تكليف الطالب بإعداد تقارير مختصرة لبعض المواضيع وتنفيذ الواجبات المنزلية. 4.حلقات نقاشية لمعالجة المشاكل التي يواجهها الطالب في المادة. 5-إعطاء الأنشطة الجماعية أهمية من خلال تخصيص درجات على الأنشطة الجماعية . 6-إدارة المحاضرة على شكل يجعل الطالب يشعر بأهمية الوقت. 7-تشجيع الطالب على تقديم أعمال إبداعية في التخصص تواكب معايير الجودة في خدمة المجتمع. **ب-طرائق التقييم** 1.تنفيذ الواجبات اليومية. 2.الإختبارات اليومية والشهرية والنهائية. 3. الالتزام بالحضور لقاعة الدرس وانهاء الاعمال المكلف بها والواجبات والتقارير ضمن توقيتات محددة. 4-المناقشة والمشاركة الفاعلة في قاعة الدرس.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem)	17	**Structured SWL (h/w)**	1

الحمل الدراسي المنتظم للطالب خلال الفصل		الحمل الدراسي المنتظم للطالب أسبوعيا	
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	33	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	2
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	50		

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, 10 and 11
	Assignments	1	5% (5)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.				
	Report	1	5% (5)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	2 hr	30% (30)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	المفاهيم الأساسية مفهوم حقوق الإنسان (التعريف – الخصائص – الفئات)
Week 2	التعرف على تاريخ حقوق الإنسان (حقوق الإنسان في الحضارات القديمة)
Week 3	الدين وحقوق الإنسان (حقوق الإنسان في الشرائع السماوية :الدين الإسلامي – الديانة المسيحية – الديانة اليهودية)

Week 4	الإسلام وحقوق الإنسان (دور شخصية النبي محمد (ص) في ترسيخ حقوق الإنسان)
Week 5	الإسلام وحقوق الإنسان (حقوق الإنسان في الحقبة مابعد النبي محمد (ص))
Week 6	التعرف على اهم تجارب حقوق الإنسان (مصادر حقوق الإنسان العالمية)
Week 7	التجارب الاقليمية (مصادر حقوق الإنسان الإقليمية والوطنية)
Week 8	دستور العراق مابعد 2005م وحقوق الإنسان (حقوق الإنسان في دستور جمهورية العراق لسنة 2005م)
Week 9	التعرف على الحقوق والواجبات (ضمانات حقوق الإنسان وحمايتها على المستوى الدولي)
Week 10	التعرف على الحقوق والواجبات (ضمانات حقوق الإنسان وحمايتها على المستوى الوطني)
Week 11	التعرف على الحقوق والواجبات (الضمانات الدستورية لحقوق الإنسان في الدستور العراقي)
Week 12	النظرة المستقبلية (مستقبل حقوق الإنسان)
Week 13	ترسيخ فكرة منظمات المجتمع المدني الداعمة لحقوق الإنسان(دور منظمات المجتمع المدني والنقابات والجمعيات في حماية حقوق الإنسان)
Week 14	حقوق الإنسان والملكية الفكرية (تأريخ الملكية الفكرية,تعريفها,حقوقها,فئاتها,أنواعها,حمايتها)
Week 15	حقوق الإنسان والملكية الفكرية (المنظمة العالمية للملكية الفكرية, حماية الملكية الفكرية وحق المؤلف في العراق)

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	حقوق الإنسان والحريات الأساسية تأليف فيصل شنطاوي قانون حقوق الإنسان مصادره وتطبيقاته الوطنية والدولية تأليف محمد بشير الشافعي القانون الدولي لحقوق الإنسان تأليف عبد الكريم خليفة حقوق الإنسان بين المفهوم الغربي والإسلامي تأليف نبيل قرقور	

	حقوق الإنسان والحريات الأساسية تأليف هاني الطعيمات.	
Recommended Texts		
Websites	https://www.coursera.org/browse/physical-science-and-engineering/electrical-engineering	

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

Note: Marks 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.

Module Information

معلومات المادة الدراسية

Module Title	(Mathematics) رياضيات	Module Delivery

Module Type	**Core**			☒ **Theory** ☒ **Lecture** ☐ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**CSI112**				
ECTS Credits	**6**				
SWL (hr/sem)	**150**				
Module Level	1		**Semester of Delivery**	1	
Administering Department	CS		**College**	CSI	
Module Leader	Ahmed Mohsin		**e-mail**	E-mail	
Module Leader's Acad. Title	Lecturer		**Module Leader's Qualification**	Ph.D.	
Module Tutor			**e-mail**	Elaf.hussien@qu.edu.iq	
Peer Reviewer Name	Firas Hussein		**e-mail**	E-mail	
Scientific Committee Approval Date	01/06/2023		**Version Number**	1.0	

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	1-provide the student with knowledge of the function and some types of functions 2-rein forcing studying and understanding some math terms such relation ,sequences and series and calculus 3-enable the student to interpret and write math application in the field of study 4-applying math rules and rules and developing inference and conclusion among student 5- identify the ability to derive functions and the integration of function and its relationship to continuity 6-know the applications of calculus and integration in various sciences
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1-Introducing math concepts 2-Applying math concepts 3-Realizing the importance of math concepts in scientific life 4-Distinguishing between different math concepts 5-Developing students math concepts 6-Trying to reach new math concepts
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Real number and properties of operations arithmetic, domain function definition and the corresponding domain ,the extent of the function ,drawing functions and express method, the relationship between the derivative and continuity, Rolls theorem and Mean value theorem ,define integration and study methods of integration ,fundamental laws of integration, Application of integration , improper integrals.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	**1-Giving scientific lectures in classrooms and using the (data . show) table statement of the main ideas of the topic** **2-Guiding students to some websites to benefit from them** **3-Assign the student to prepare brief reports on some topics and carry out homework**

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ أسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	47	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	103	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	7
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% (10)	5 and 10	
	Assignments	1	5% (5)	2and 12	
	Projects / Lab.				
	report	1	5% (5)		
Summative assessment	**Midterm Exam**	2hr	30% (30)	6 and 13	
	Final Exam	3hr	50% (50)	7	
Total assessment			100% (100 Marks)	15	

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	Real number
Week 2	Functions
Week 3	Limit and continuity
Week 4	Derivative
Week 5	Rolls theorem and Mean value theorem
Week 6	Application of Derivative
Week 7	definite integration
Week 8	indefinite integration
Week 9	Transcendental function
Week 10	Transcendental function
Week 11	Methods of integration
Week 12	Methods of integration
Week 13	Methods of integration
Week 14	Application of integration
Week 15	Faulty integrations

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	• **Thomas G.B.**Calculus and Analytic Geometry 4th 1984	Yes
Recommended	www. Free science. Info/mathالمواقع الالكترونية الرصينة	

Texts		

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

Note: Marks 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.

Module Information معلومات المادة الدراسية		
Module Title	**Economy/اقتصاد**	**Module Delivery**
Module Type	**S**	☒ **Theory** ☒ **Lecture** ☐ **Lab** ☐ **Tutorial**
Module Code	**UNV111**	
ECTS Credits	**4**	

SWL (hr/sem)	**100**	☐ **Practical** ☐ **Seminar**	
Module Level	1	**Semester of Delivery**	1
Administering Department	CS	**College**	CSI
Module Leader	Haider Hussein	**e-mail**	
Module Leader's Acad. Title	Assist. Lecturer	**Module Leader's Qualification**	Master
Module Tutor		**e-mail**	
Peer Reviewer Name	Ghaith hakim	**e-mail**	
Scientific Committee Approval Date	20/06/2023	**Version Number**	1.0

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	None	**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	ان يتعرف الطالب على أنماط التحليل الاقتصادي والإداري. ان يتمكن الطالب من التمييز بين الجانب التطبيقي والتحليلي. ان يمتلك الطالب تصور كامل عن الأمور الاقتصادية. ان يتمكن الطالب من الاستفادة من الأمور التي تعلمها في سوق العمل.

Module Learning Outcomes مخرجات التعلم للمادة الدراسية	ان يتمكن الطالب من معرفة الأسس المفاهيمية للنظريات الاقتصادية وكيفية الاستفادة منها في الحياة العملية .ان يتعرف الطالب على علم الاقتصاد وعلاقته بالعلوم الأخرى مما يحقق له الاستفادة القصوى من المقرر ان يتعرف الطالب على عوامل التحليل الاقتصادي وعوامل الإنتاج ودراسة سلوك المستهلك بما يجعله قادرا على .المنافسة في سوق العمل .ان يتعرف الطالب على مفهوم الطلب والعرض والعوامل المؤثرة فيهما .الأهداف المهاراتية الخاصة بالمقرر .ان يتملك الطالب مهارة التعامل مع الموارد الاقتصادية المتاحة و كيفية استخدامها الاستخدام الأمثل ان يمتلك الطالب القدرة على تفسير المضامين الاقتصادية و بمهارة عالية
Indicative Contents المحتويات الإرشادية	مقدمة في مبادئ الاقتصاد تعريف النظرية الاقتصادية الاقتصاد الكلي والجزئي التحليل الاقتصادي علاقة الاقتصاد بالعلوم الأخرى تعريف اهم المشاكل الاقتصادية و اسبابها الفعاليات الاقتصادية ,مفهوم الطلب, قانون الطلب, منحنى الطلب العوامل المؤثرة على الطلب, مرونة الطلب مفهوم المنفعة, النظرية الكلاسيكية لسلوك المستهلك المنفعة الكلية والمنفعة الحدية مفهوم العرض, قانون العرض, منحنى العرض العوامل المؤثرة في العرض نظرية الإنتاج, دالة الإنتاج, قانون الغلة المتناقصة عوامل الانتاج

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	تتمثل الإستراتيجية الرئيسية التي سيتم تبنيها في تقديم هذه الوحدة في تشجيع الطلاب على المشاركة في التدريبات ، مع تحسين مهارات التفكير النقدي لديهم وتوسيعها في نفس الوقت. سيتم تحقيق ذلك من خلال الفصول والبرامج التعليمية التفاعلية ومن خلال التفكير في نوع التجارب البسيطة التي تتضمن بعض أنشطة أخذ العينات التي تهم الطلاب.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	32	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	68	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

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, 10 and 11
	Assignments	1	5% (5)	2, 12	LO # 3, 4, 6 and 7

	Projects / Lab.				
	Report	1	5% (5)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	30% (30)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	مقدمة في مبادئ الاقتصاد
Week 2	تعريف النظرية الاقتصادية
Week 3	الاقتصاد الكلي والجزئي
Week 4	التحليل الاقتصادي
Week 5	علاقة الاقتصاد بالعلوم الأخرى
Week 6	تعريف اهم المشاكل الاقتصادية و اسبابها
Week 7	الفعاليات الاقتصادية
Week 8	مفهوم الطلب, قانون الطلب, منحنى الطلب,
Week 9	العوامل المؤثرة على الطلب, مرونة الطلب
Week 10	مفهوم المنفعة, النظرية الكلاسيكية لسلوك المستهلك
Week 11	المنفعة الكلية والمنفعة الحدية
Week 12	مفهوم العرض, قانون العرض, منحنى العرض
Week 13	العوامل المؤثرة في العرض
Week 14	نظرية الإنتاج, دالة الإنتاج, قانون الغلة المتناقصة

Week 15	عوامل الانتاج
Week 16	

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	مبادئ الاقتصاد – الدكتور عبد الكريم الحسناوي اساسيات علم الاقتصاد – دكتور حسين عجلان و اخرون	Yes
Recommended Texts	المجلات العلمية في الاختصاصات الخاصة بعلم الاقتصاد	No
Websites	المواقع الالكترونية المتخصصة .	

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

Note: Marks 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.

Module Information
معلومات المادة الدراسية

Module Title	**Programming C++**		**Module Delivery**	
Module Type	**B**		☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**CSI121**			
ECTS Credits	**8**			
SWL (hr/sem)	**200**			
Module Level	1	**Semester of Delivery**	2	
Administering Department	CS	**College**	CSI	
Module Leader	Nisreen Riyadh	**e-mail**		
Module Leader's Acad. Title	Lecturer	**Module Leader's Qualification**	Master	
Module Tutor		**e-mail**		
Peer Reviewer Name	Zainab Fahad	**e-mail**		
Scientific Committee Approval Date	01/06/2023	**Version Number**	1.0	

Relation with other Modules
العلاقة مع المواد الدراسية الأخرى

Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	1. Understanding more C++ libraries. 2. Understanding the function in C++, and knowing how to write programs efficiently by creating and using the functions. 3. Learning different instructions, programming concepts, ideas and data structures like array, pointers, functions, strings and structures in order to build different programs efficiently. 4. Increasing the student ability to write, test, debug and run different programs. 5. Enhancing the student's ability to program in C++, taking into account the program's storage space and execution time.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Understanding the Function. 2. Understanding the recursive functions. 3. Understanding the array (1D array) 4. Understanding the 2D array 5. Learn the references and pointers. 6. Understanding the structures
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Part A: • Function in C++ • Passing parameters to functions. • Overloading • Recursive functions. Part B: • Array in C++ • 1D array in C++ • 2D array in C++ Part C: • Pointers and references • References in C++ • Pointers in C++ • Pointers and array.

	• Pointer to pointer Part D: • String in C++ • cstring library in C++ • pointers and string Part E: • Structure in C++ • Array of structures.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	In this course, the student learned the basics of programming through theoretical lectures and practical application in the laboratory, in addition to daily assignments and daily tests, asking some questions and using the brainstorming method.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	136	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	9.1
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**200**		

Module Evaluation تقييم المادة الدراسية				
	Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**

Formative assessment	**Quizzes**	2	5% (5)	7 and 11	LO #1,#2,#3,#4 and #5,#6
	Assignments	1	5% (5)	4, 5 ,10 and 13	LO #1, #2and #3,#4, and #5 ,and #6
	Projects / Lab.	15	20% (20)	Continuous	All
	Report	1	5% (5)		
Summative assessment	**Midterm Exam**	2hr	15% (15)	12	LO #1 - #7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Function in C++ • Defining the function. • Explain the advantages of the functions. • How to declare the defining and calling the function • Examples on functions
Week 2	More about functions • Passing parameters to function (by value and by reference) • Examples on passing parameters. • Overloading
Week 3	More about function • Recursive Function • Examples on recursive function.
Week 4	Array in C++

	• One Dimension array. • How to declare the array. • How to access the array elements. • How to read and write the array.
Week 5	More about the array. • Examples on 1 D array.
Week 6	More about array. • How to declare a 2D array. • How to access, read and write 2D array elements. • Characteristics of square matrix A[n][n]. • Examples on 2D arrays.
Week 7	More about array • More examples on array.
Week 8	Reference and pointers • Defining the reference • Defining the pointer. • Dereferencing operator • Examples on reference and pointer
Week 9	Pointers in C++ • Pointer to pointers • Pointer and array • Examples on pointer to pointer • Examples on pointer and array
Week 10	• String in C++ • Defining the string. • Examples on reading and writing the string • Pointer and string
Week 11	More about the string in c++

	• Using cstring library • Examples on cstring liberary
Week 12	Structure in C++ • Defining the structure in c++ • How to declare the structure • How to read and write the structure elements. • Examples on structure.
Week 13	More about structures • Array of structures. • Declaring, reading and writing the array of structures.
Week 14	• More examples on structures.
Week 15	**A comprehensive review on the**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Perform examples on Function in C++
Week 2	Perform examples on Passing parameters in C++ and overloading
Week 3	Perform examples on Recursive functions
Week 4	Perform examples on 1D array in C++
Week 5	More examples on 1D arrays
Week 6	Perform examples on 1D arrays.
Week 7	Examples on 2D arrays
Week 8	Examples on square array characteristics
Week 9	Perform examples on references

Week 10	Perform examples on pointers
Week 11	More examples on pointers and array
Week 12	Perform examples on string
Week 13	More examples on string and Cstring library
Week 14	More examples on structure
Week 15	Comprehensive review on the course

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	• C++: How To Program, Deitel and Deitel, 4th edition, Pren ce Hall, 2002. • Programming in C, Stephen Kochan, 3rd edi on, Sams, 2004. • The C Programming Language, Brian W. Kernighan and Dennis M. Ritchie, 2nd edition, Prentice Hall, 1988.	No
Recommended Texts	• C Programming: A Complete Guide to Mastering the C Language, Augie Hansen and August Hansen, Addison-Wesley, 1989.	No
Websites	https://www.coursera.org/courses?query=c%20plus%20plus	

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

Note: Marks 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.

Module Information
معلومات المادة الدراسية

Module Title	**Discrete Structure**	**Module Delivery**	
Module Type	Basic	☒ **Theory** ☒ **Lecture** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**CSI122**		
ECTS Credits	**6**		
SWL (hr/sem)	**150**		
Module Level	1	**Semester of Delivery**	2
Administering Department	CS	**College**	CSI
Module Leader	Firas Hussean Maghool	**e-mail**	firas.maghool@qu.edu.iq
Module Leader's Acad. Title	Assist. Professor	**Module Leader's Qualification**	Ph.D.
Module Tutor	Name	**e-mail**	E-mail
Peer Reviewer Name	Alaa Hussin Hammadi	**e-mail**	alaa.hammadi@qu.edu.iq
Scientific Committee Approval Date	01/06/2023	**Version Number**	1.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	The student is able to understand the basics of mathematical logic, methods of mathematical proof, study groups and operations on them, in addition to understanding relationships and their types, reviewing the concept of functions and familiarizing themselves with them, in a way that enhances the student's ability in mathematics
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Express a given logic sentence in terms of predicates, quantifiers, and logical connectives. 2. Derive the solution for a given a problem, using deductive logic and prove the solution based on logical inference. 3 . Classify a mathematical problem into its algebraic structure. 4 .Evaluate Boolean functions and simplify expressions using the properties of Boolean algebra. 5.Develop the given problem as graph networks and solve with techniques of graph theory.
Indicative Contents المحتويات الإرشادية	mathematical Logic: Statements and notations, Connectives, Well-formed formulas, Truth Tables, tautology, equivalence implication, Normal forms. Predicates: Predicative logic, Free & Bound variables, Rules of inference, Consistency, proof of contradiction. Set Theory: Properties of binary Relations, equivalence, compatibility and partial ordering relations, Functions, Inverse Function Composite of functions, recursive Functions,

	Lattice and its Properties, Pigeon hole principle and its application. Algebraic Structures: Algebraic systems Examples and general properties, Semi groups and monads, groups sub groups' homomorphism, Isomorphism. Elementary Combinatorics : Basics of counting, Combinations & Permutations…

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.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	47	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	103	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	7
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% (10)	5 and 10	LO #1, #2 and #10, #11
	Assignments	1	5% (5)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.				
	Report	1	5% (5)	6 and 13	LO #5, #8 and #10
Summative assessment	Midterm Exam	2hr	30% (30)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Mathematical Logic
Week 2	Predicates
Week 3	Rules of inference
Week 4	Relations, properties of Binary Relation
Week 5	Partial ordering relations
Week 6	Set Theory:
Week 7	Algebraic structures
Week 8	Functions,

Week 9	Composition of functions
Week 10	inverse function
Week 11	Karnaugh map
Week 12	Simplification and Boolean function
Week 13	Combinational and sequential analysis and design
Week 14	Combinational and sequential analysis and design
Week 15	Graph Theory
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	**Available in the Library?**
Required Texts	• Digital Design, Third Edition, by M. Morris Mano. Prentice-Hall, Inc. 2002 • Logic Design ,Digital Principles and Application", Malvino, 2000 • "Introduction to Logic Design" (2nd) edition), Sajjan G. Shiva, 2007. • Jayant Ganguly, Mathematical foundation for computer science 2010.	
Recommended Texts	• Discrete Mathematics with Applications, ThomasKoshy, Elsevier 2003,	
Websites		

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

Note: Marks 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.

Module Information
معلومات المادة الدراسية

Module Title	**Computer organization**			**Module Delivery**	
Module Type	**B**			☒ **Theory**	
Module Code	**CS121**			☒ **Lecture**	
ECTS Credits	**6**			☐ **Lab**	
SWL (hr/sem)	**150**			☐ **Tutorial**	
				☐ **Practical**	
				☐ **Seminar**	
Module Level	1		**Semester of Delivery**	2	
Administering Department	CS		**College**	CSI	
Module Leader	Farah Jawad		**e-mail**	E-mail	
Module Leader's Acad. Title	Assist. Lecturer		**Module Leader's Qualification**	Master	
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Saad Hussein		**e-mail**	E-mail	
Scientific Committee Approval Date	01/06/2023		**Version Number**	1.0	

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**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. It means giving the basic principles of the components of computers 2. To understand function, component, structure of the computer unit(memory, cpu, I/O devices with other peripherals). 3. To understand the assembly language, types of instructions and how can execute the instruction within the computer.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	**Cognitive goals** 1. Give the student a description of the design of simple logic circuits 2. Explain the computer infrastructure 3. Give a brief introduction to computer architecture **Skill goals** 1.The student acquires the skill and ability to deal with the computer 2.Developing the student's ability to invest in computer organizational structures in the future
Indicative Contents المحتويات الإرشادية	**Main Part** Computer components(3 hrs) Function of units(6hrs) Instruction types(6hrs) Machine instruction(6 hrs) Processing units(3hrs) Instruction cycle(6hrs)

	Memory types(9hrs) I/O devices(3hrs) Program controlled types(3hrs)

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	The main strategy that will be Giving scientific lectures by using data show, Take advantage of websites,to achieve tutorial ,report for some subject. Holding panel discussions. Adopted in delivering this module is to encourage students' participation in the exercises involving some sampling activities that are interesting to the students.
Evaluation modalities	Student attendance, Executing homework daily and monthly tests and Student participation during the lecture

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	47	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	103	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	7
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% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	1	5% (5)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.				
	Report	1	5% (5)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	2 hr	30% (30)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction :functions and structure of computer
Week 2	Functional components of a computer, Interconnection of components, Performance of a compute
Week 3	Functional components of a computer, Interconnection of components, Performance of a compute
Week 4	Representation of Instructions: Machine instructions, Operands, Addressing Representation of Instructions: Machine instructions, Operands, Addressing modes,
Week 5	Representation of Instructions: Machine instructions, Operands, Addressing Representation of Instructions: Machine instructions, Operands, Addressing modes,
Week 6	Instruction formats, Instruction sets, Instruction set architectures -CISC and RISC architectures
Week 7	Instruction formats, Instruction sets, Instruction set architectures -CISC and RISC architectures
Week 8	Processing Unit: Organization of a processor -Registers, ALU and Control unit, Data path in a CPU,Response
Week 9	Instruction cycle, Organization of a control unit -Operations of a control unit, Hardwired control unit, Microprogrammed control unit.
Week	Instruction cycle, Organization of a control unit -Operations of a control unit, Hardwired

10	control unit, Microprogrammed control unit.
Week 11	Memory Subsystem: Semiconductor memories, Memory cells -SRAM and DRAM cells, Internal Organization of a memory chip, Organization of a memory unit, Error correction memories, Interleaved memories, Cache memory unit -Concept of cache memory, Mapping methods, Organization of a cache memory unit, Fetch and write mechanisms, Memory management unit -Concept of virtual memory, Address tltiHdtft
Week 12	Memory Subsystem: Semiconductor memories, Memory cells -SRAM and DRAM cells, Internal Organization of a memory chip, Organization of a memory unit, Error correction memories, Interleaved memories, Cache memory unit -Concept of cache memory, Mapping methods, Organization of a cache memory unit, Fetch and write mechanisms, Memory management unit -Concept of virtual memory, Address tltiHdtft
Week 13	Memory Subsystem: Semiconductor memories, Memory cells -SRAM and DRAM cells, Internal Organization of a memory chip, Organization of a memory unit, Error correction memories, Interleaved memories, Cache memory unit -Concept of cache memory, Mapping methods, Organization of a cache memory unit, Fetch and write mechanisms, Memory management unit -Concept of virtual memory, Address tltiHdtft
Week 14	Input/Output Subsystem: Access of I/O devices, I/O ports, I/O control mechanisms
Week 15	Program controlled I/O Interrupt controlled I/O and DMA controlled I/O I/O interfaces Program controlled I/O, Interrupt controlled I/O, and DMA controlled I/O
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	**Available in the Library?**
Required Texts	C. Hamacher, Z. Vranesic and S. Zaky, "Computer Organization", McGrawHill, 2002	Yes
Recommended Texts	DC Electrical Circuit Analysis: A Practical Approach Copyright Year: 2020, dissidents. William Stallings: Computer Organization & Architecture, 9th Edition, Pearson, 2015.	No

	Carl Hamacher, Zvonko Vranesic, Safwat Zaky, Computer Organization, 5th Edition, Tata McGraw Hill, 2002. (Listed topics only from Chapters 1, 2, 4, 5, 6, 7, 8, 9 and12)	
Websites		

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

Note: Marks 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.

Module Information
معلومات المادة الدراسية

Module Title	Arabic Language	**Module Delivery**	
Module Type	S	☒ **Theory** ☒ **Lecture** ☐ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	UNV122		
ECTS Credits	4		
SWL (hr/sem)	100		
Module Level	1	**Semester of Delivery**	2

Administering Department	CS	**College**	CSI
Module Leader	Makarim Kishan	**e-mail**	E-mail
Module Leader's Acad. Title	Lecturer	**Module Leader's Qualification**	Ph.D.
Module Tutor	Name (if available)	**e-mail**	E-mail
Peer Reviewer Name	Nasirallah Galib	**e-mail**	E-mail
Scientific Committee Approval Date	01/06/2023	**Version Number**	1.0

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	**تعليم الطلبة مهارات الكتابة الصحيحة على مستوى الأملاء والنحو والصرف فضلا عن تعليم الطلبة أسلوب تحليل النص بالرجوع الى نصوص قرآنية, ونصوص أدبية معتبرة, إلى جانب تنمية قدرة الطلبة على الإلقاء بأسلوب مناسب.**
Module Learning Outcomes مخرجات التعلم للمادة	**أ-** **الأهداف المعرفية:** **اكتساب ما تم توضيحه من المفردات في حقل "المواضيع المطلوب بحثها و شمولها "** **اكتساب مهارات الكتابة الادبية الصحيحة**

الدراسية	التأكد من ان الطالب قادر علي الكتابة الموافقة لقواعد اللغة وعلامات الترقيم ب- الأهداف المهاراتية الخاصة بالمقرر: اكساب الطالب المهارة التي تمكنه من كتابة النصوص العربية بشكل صحيح و مراعاة علامات التنقيط و قواعد اللغة العربية. اكساب الطالبة المهارة التي تمكنه من صياغة الجمل بشكل واضح و بأسلوب ادبي شيق.
Indicative Contents المحتويات الإرشادية	

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	• **قراءات ، تعلم ذاتي ، حلقات نقاش.** • **التدريبات والأنشطة في قاعة الدرس.** • **إرشاد الطلاب إلى بعض المواقع الالكترونية للإفادة منها.** • **عقد حلقات بحثية يتم من خلالها شرح وتحليل النصوص الأدبية.**

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	32	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	68	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**100**		

Module Evaluation

تقييم المادة الدراسية

	Time/Number	Weight (Marks)	Week Due	Relevant Learning

					Outcome
Formative assessment	**Quizzes**	2	10% (10)	5 and 10	LO #1, #2 and #10, #11
	Assignments	1	5% (5)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.				
	Report	1	5% (5)	13	LO #5, #8 and #10
Summative assessment	**Midterm Exam**	2hr	30% (30)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الأسبوعي النظري	
	Material Covered
Week 1	**تعليم الطلبة كيفية كتابة الهمزة**
Week 2	**تعليم الطلبة كيفية كتابة الهمزة**
Week 3	**تعليم الطلبة قواعد العدد والنعت العددي**
Week 4	**تعليم الطلبة كيفية صياغة العدد على وزن فاعل**
Week 5	**تعليم الطلبة كيفية وضع علامات الترقيم في النص الكتابي**
Week 6	**تعليم الطلبة كيفية كتابة الضاد والظاء**
Week 7	**تعليم الطلبة كيفية التمييز بين الألف المقصورة والألف الممدودة**
Week 8	**تعليم الطلبة الحروف التي يجب حذفها من الكلمة والحروف التي يجب إضافتها للكلمة**
Week 9	**تعليم الطلبة علامات الإعراب الأصلية والفرعية**
Week 10	**تعليم الطلبة التمييز بين التاء المربوطة والهاء في آخر الكلمة**
Week 11	**تعليم الطلبة بقواعد الجملة الإسمية**

Week 12	**تعليم الطلبة بقواعد الجملة الفعلية**
Week 13	**تعليم الطلبة مفهوم الأدب العربي وأهم عصوره التأريخية وفنونه الأدبية**
Week 14	**تعليم الطلبة حفظ نص قرآني وتحليله**
Week 15	**تعليم الطلبة حفظ نص أدبي وتحليله**

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	• **كتاب اللغة العربية لغير الاختصاص تأليف الدكتور رشيد العبيدي وأخرين** • **كتاب الأملاء الواضح تأليف علي الجارم وأحمد أمين** • **النحو الوافي تأليف عباس حسن** • **العصر الجاهلي تأليف شوقي ضيف** • **الميزان في تفسير القرآن تأليف محمد حسين الطباطبائي**	
Recommended Texts		
Websites		

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

Note: Marks 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.

Module Information
معلومات المادة الدراسية

Module Title	**English 1**	**Module Delivery**	
Module Type	**S**		☒ **Theory**
Module Code	**UNV123**		☒ **Lecture**
ECTS Credits	**4**		☐ **Lab**
SWL (hr/sem)	**100**		☐ **Tutorial**
			☐ **Practical**
			☐ **Seminar**

Module Level	1	**Semester of Delivery**	2
Administering Department	CS	**College**	CSI
Module Leader	Maitham Abdalhamza	**e-mail**	E-mail
Module Leader's Acad. Title	Assist. Lecturer	**Module Leader's Qualification**	Master
Module Tutor		**e-mail**	
Peer Reviewer Name	Qaiser Abid	**e-mail**	E-mail
Scientific Committee Approval Date	01/06/2023	**Version Number**	1.0

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**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-The aim of this course is to provide English learners with integrated language skills such as reading, listening and writing resulting in a level of basic language knowledge. 2-This course will focus on grammar rules, basic word knowledge and usage, reading comprehension, reading out of the lesson, and Paragraph writing. 3- A student may be able to listen to native speakers and speak English Language. 4- A student may be able to write and have creativity in his writing.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- Uses expressions of Quantity in elementary level of English. 2- Constructs sentences in Present Perfect Tense, Simple Future Tense and Going to Future Tense both in an oral and written task. 3- Defines basic Modals and employ them in elementary level of communication and writing skills. 4- Translates sentences in elementary level from English to another language. 5- Interprets the texts written in elementary level of English. **6-Language** is a rule-governed behavior. It is defined as the comprehension and/or use of a spoken (i.e., listening and speaking), written (i.e., reading and

	writing), and/or **other communication symbol system** (e.g., American Sign Language). **7-Spoken and written language** are composed of receptive (i.e., listening and reading) and expressive (i.e., speaking and writing) components. Spoken language, written language, and their associated components (i.e., receptive and expressive) are each a synergistic system comprised of individual language domains (i.e., phonology, morphology, syntax, semantics, pragmatics) that form a dynamic integrative whole
Indicative Contents المحتويات الإرشادية	1- Language and vocabulary 2- Grammar 3- Writing skill

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1- Uses the available material to increase his efficiency. 2- Constructs sentences in Present Perfect Tense, Simple Future Tense and Going to Future Tense both in an oral and written task. 3-Defines basic Modals and employ them in elementary level of communication and writing skills. 4- Develop and enhance students' language skills to communicate in English properly. 5- Interprets the texts written in elementary level of English.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	32	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	68	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

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, 10 and 11
	Assignments	1	5% (5)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.				
	Report	1	5% (5)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	30% (30)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	How to say your name , sociol expression
Week 2	Cities and countries (your word)

Week 3	Jobs, personal information ,Negatives and Questions
Week 4	Family and friends (possessives),has, have, the.
Week 5	The way I live (languages and national-ities)
Week 6	Every day (adverbs, Days of week, word that go together)
Week 7	Mid term exam
Week 8	Where I live (Rooms and furniture)
Week 9	Preposition , Direction
Week 10	Times Past (saying Years, irregular verbs)
Week 11	We had a great time (sport and leisure)
Week 12	I can do that(can, can't , everyday problems))
Week 13	Please and thank you(I'd like, some/any/signs all around)
Week 14	Colours and Clothes ,present continuous, opposite verbs)
Week 15	Revision as preparation for the final exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	**Available in the Library?**
Required Texts	Soars & John, (2019). New Headway plus (Beginners)Oxford University Press.	Yes
Recommended Texts		
Websites	https://www.bbc.co.uk/learningenglish/	

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

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Module Information معلومات المادة الدراسية			
Module Title	الديمقراطية	**Module Delivery**	
Module Type	S	☒ **Theory** ☒ **Lecture** ☐ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	UNV121		
ECTS Credits	2		
SWL (hr/sem)	50		
Module Level	1	**Semester of Delivery**	2

Administering Department		CS	**College**	CSI	
Module Leader	Nasiallah Galib		**e-mail**	E-mail	
Module Leader's Acad. Title		Lecturer	**Module Leader's Qualification**		Ph.D.
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name		Makarim Kishan	**e-mail**	E-mail	
Scientific Committee Approval Date		01/06/2023	**Version Number**		1.0

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	تهدف المادة الدراسية من خلال مفرداتها الى بيان مفهوم الديمقراطية ومميزاتها وأنواعها، ومن ثم البحث في اثر الديمقراطية المباشرة وغير المباشرة على المجتمع، وهل ان ركائز الديمقراطية بأنواعها المختلفة المترابطة تحقق الأهداف التي يسمو لها المجتمع في ظل تطور اليات الديمقراطية عبر التأريخ، وكيف يمكن مواجهة التحديات التي تنفرد بها الأنظمة الحاكمة للحد من الديمقراطية.
Module Learning Outcomes مخرجات التعلم للمادة	أ- **الأهداف المعرفية:** **اكتساب ما تم توضيحه من المفردات في حقل "المواضيع المطلوب بحثها و شمولها "** **اكتساب مهارات الحوار الديمقراطي** **التأكد من ان الطالب قادر علي طرح افكارة في أسلوب ديمقراطي بناء** **ب- الأهداف المهاراتية الخاصة بالمادة:**

أن يكتسب الطالب المهارات الخاصة بالتعامل الديمقراطي. **أن يكتسب الطالب القدرة الفهم الصحيح للديمقراطية.** **أن يكتسب الطالب المعرفة الضرورية بالحقوق و الواجبات.** **ج - الأهداف الوجدانية والقيمية.** **تشجيع الطلاب على الاستفادة من المقرر من خلال الايمان بأهمية المقرر في العملية التعليمية وفي مجال التخصص بشكل عام.** **تشجيع الطلبة ورفع روح المنافسة بينهم.** **تعزيز التعاون بين الطلاب من خلال تنفيذ الواجبات العملية.**	الدراسية
تهدف المادة الدراسية من خلال مفرداتها الى بيان مفهوم الديمقراطية ومميزاتها وأنواعها، ومن ثم البحث في اثر الديمقراطية المباشرة وغير المباشرة على المجتمع، وهل ان ركائز الديمقراطية بأنواعها المختلفة المترابطة تحقق الأهداف التي يسمو لها المجتمع في ظل تطور اليات الديمقراطية عبر التأريخ، وكيف يمكن مواجهة التحديات التي تنفرد بها الأنظمة الحاكمة للحد من الديمقراطية.	**Indicative Contents** المحتويات الإرشادية

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
طرائق التعليم والتعلم . إعطاء الأنشطة الجماعية أهمية من خلال تخصيص درجات على الأنشطة الجماعية .إدارة المحاضرة على شكل يجعل الطالب يشعر بأهمية الوقت .تشجيع الطالب على تقديم اعمال إبداعية في التخصص تواكب معايير الجودة في خدمة المجتمع طرائق التقييم الالتزام بالحضور لقاعة الدرس وانهاء الاعمال المكلف بها (الواجبات والتقارير) ضمن توقيتات محددة المناقشة والمشاركة الفاعلة في قاعة الدرس إعطاء الأنشطة الجماعية أهمية من خلال تخصيص درجات على الأنشطة الجماعية . إدارة المحاضرة على شكل يجعل الطالب يشعر بأهمية الوقت. تشجيع الطالب على تقديم اعمال إبداعية في التخصص تواكب معايير الجودة في خدمة المجتمع. تحفيز المهارات العامة والتأهيلية المنقولة المهارات الأخرى المتعلقة بقابلية التوظيف والتطور الشخصي .أن يكتسب الطالب القدرة على العمل الديمقراطي .تنمية روح التعاون لدى الطلبة و تعزيز مفاهيم الحرية .تعزيز العمل الديمقراطي لدى الطلبة و احترام رأي الآخرين	**Strategies**

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	17	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	1
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	33	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	2
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**50**		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	10% (10)	5 and 10	LO #1, #2 and #10, #11
	Assignments	1	5% (5)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.				
	Report	1	5% (5)	13	LO #5, #8 and #10
Summative assessment	**Midterm Exam**	2hr	30% (30)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري	
	Material Covered
Week 1	**مفهوم الديمقراطية**
Week 2	**التعرف على مميزات الديمقراطية**
Week 3	**أنواعها**
Week 4	**المزايا والعيوب**
Week 5	**ركائز الديمقراطية**
Week 6	**المفاهيم الأساسية**
Week 7	**التعرف على البعد التاريخي**
Week 8	**النهوض بالواقع العربي**
Week 9	**التعرف على الاليات**
Week 10	**ترسيخ الأفكار**
Week 11	**حقوق الانسان والديمقراطية**
Week 12	**الأصل التاريخي**
Week 13	**الديمقراطية في الدستور العراقي**
Week 14	**التعرف على التحديات**
Week 15	**المشكلات التي واجهت الديمقراطية في العراق**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	**منشورات مفوضية حقوق الانسان في العراق/ مركز البحوث. - الديمقراطية/ تأليف د. رياض عزيز هادي، بغداد 2008.**	

	- الديمقراطية من الفكر الى التطبيق/تأليف د. حامد حمزة، مجلة دراسات سياسية، بيت الحكمة، العدد(15) لسنة 2010 بغداد. **– جدلية العلاقة بين الديمقراطية و تداول السلطة، مجلة دراسات سياسية، بيت الحكمة، العدد(16) لسنة 2010 بغداد.**	
Recommended Texts		
Websites		

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

Note: Marks 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.

Module Information

معلومات المادة الدراسية					
Module Title	**Object Oriented Programming**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**CS211**				
ECTS Credits	**8**				
SWL (hr/sem)	**200**				
Module Level	2		**Semester of Delivery**	3	
Administering Department	CS		**College**	CSIT	
Module Leader	Dhiah Al-Shammary		**e-mail**	E-mail d.alshammary@qu.edu.iq	
Module Leader's Acad. Title	Assist. Professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Talib Turkey		**e-mail**	E-mail talib.turkey@qu.edu.iq	
Scientific Committee Approval Date	01/06/2023		**Version Number**	1.0	

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	CSI111	**Semester**	1
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims	• Learn the basics of object-oriented programming (class and object).

أهداف المادة الدراسية	• Learn the basics of programming languages used with the concept of OOP. • Teach the student the difference between an object and a constraint. • Learn the concept of encapsulation. • Programming the concept of inheritance. • Programming the concept of polymorphism
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	• Learn a new concept in programming. • Enabling the student to know the principles of the Class • Enabling the student to know the principle of Class • Enable the student to know the benefits of Object • Enabling the student to know the principle of inheritance • Enable the student to understand Constrictor and De-Constrictor • Design programs within the concept of OOP. • Provide the student with the necessary knowledge to build good programs and possess the necessary knowledge to link programs and applications with each other using the concepts of entity programming.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. • Introduction and definition of the object-oriented programming method and what are its characteristics that distinguish it from other types and methods of programming • Introducing how to build entities and their parts and what are their benefits • Building special functions to perform specific operations of general interest • The method of overlapping functions, how they work with each other, and how data moves between them • Method of protection and its benefits and what are the different types

	• The method of inheritance between parents and children • The method of inheritance between parents and children • The method of inheritance between parents and children • The method of inheritance between parents and children

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.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4.3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	136	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	9.1
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	200		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	5% (5)	5, 10	LO #1, 2, 10 and 11
	Assignments	1	5% (5)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	15	20% (20)	Continuous	All
	Report	1	5% (5)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	2hr	15% (15)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Classes, Constructors and Destructors
Week 2	Overloading Constructors, Default Constructors, Pointers to Classes
Week 3	Overloading Operators
Week 4	Keyword ‘This’, Static members
Week 5	Friend function, Friend Class
Week 6	Inheritance
Week 7	Inheritance
Week 8	Polymorphism

Week 9	Polymorphism
Week 10	Pointers to Base Class, Virtual Members
Week 11	Abstract Base Classes
Week 12	Function Templates, Class Templates
Week 13	Template Specialization, Templates and multiple-file projects
Week 14	Namespace, using, namespace alias
Week 15	Exceptions
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Classes, Constructors and Destructors
Week 2	Overloading Constructors, Default Constructors, Pointers to Classes
Week 3	Overloading Operators
Week 4	Keyword 'This', Static members
Week 5	Friend function, Friend Class
Week 6	Inheritance
Week 7	Inheritance
Week 8	Polymorphism
Week 9	Polymorphism
Week 10	Pointers to Base Class, Virtual Members
Week 11	Abstract Base Classes

Week 12	Function Templates, Class Templates
Week 13	Template Specialization, Templates and multiple-file projects
Week 14	Namespace, using, namespace alias
Week 15	Exceptions

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	**Available in the Library?**
Required Texts	Object-Oriented Programming in C++, Fourth Edition	Yes
Recommended Texts	Thinking in C++, Volume 2: Practical Programming	No
Websites	www.studytonight.com/cpp/cpp-and-oops-concepts	

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

Note: Marks 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.

Module Information
معلومات المادة الدراسية

Module Title	**Microprocessor and Assembly Language**		**Module Delivery**	
Module Type	C		☒ **Theory**	
Module Code	CS212		☒ **Lecture**	
ECTS Credits	8		☒ **Lab**	
SWL (hr/sem)	200		☐ **Tutorial**	
			☐ **Practical**	
			☐ **Seminar**	
Module Level	2	**Semester of Delivery**	3	
Administering Department	CS	**College**	CSI	
Module Leader	Ahmed Mohamed	**e-mail**		
Module Leader's Acad. Title	Lecturer	**Module Leader's Qualification**	Ph.D.	
Module Tutor		**e-mail**		
Peer Reviewer Name	Ali Hakim	**e-mail**		
Scientific Committee Approval Date	01/06/2023	**Version Number**	1.0	

Relation with other Modules
العلاقة مع المواد الدراسية الأخرى

Prerequisite module	CS112	**Semester**	1

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. 2. Learn the basic components of a computer. 3. Understanding Microprocessors: The module aims to familiarize students with the architecture, organization, and functioning of microprocessors. It covers topics such as CPU components, memory hierarchy, input/output interfaces, and bus systems. 4. Assembly Language Programming: The module aims to teach students how to write assembly language programs to control and interact with microprocessors. It covers the syntax, instructions, addressing modes, and programming concepts specific to the chosen assembly language. 5. Instruction Set Architecture: The module aims to provide an understanding of the instruction set architecture (ISA) of a specific microprocessor. It covers the various types of instructions, their formats, and their operations. Students learn how to program using the instruction set provided by the microprocessor. 6. Memory and I/O Operations: The module aims to teach students how to interface with memory and various input/output devices using assembly language. It covers topics such as memory addressing, data transfer operations, interrupts, and I/O port programming. 7. Programming Techniques: The module aims to introduce students to programming techniques specific to microprocessors and assembly language. It covers topics such as flow control (branches, loops), subroutine calls, parameter passing, stack operations, and data manipulation. 8. Memory Write Machine Cycle.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	The learning outcomes typically focus on the knowledge, skills, and abilities that students are expected to acquire upon completion of the course. Here are some common learning outcomes for such a module: 1. Learn about Microprocessor and Assembly Language 2. Knowledge of Microprocessor Architecture. 3. Understanding of Assembly Language Programming. 4. Ability to Interface with Memory and I/O Devices. 5. Debugging and Testing Skills. 6. Application of Microprocessors and Assembly Language.

Indicative Contents المحتويات الإرشادية	Indicative content includes the following. 1. Introduction to Microprocessors: • Overview of microprocessors and their applications • Historical development and evolution of microprocessors • Basic components and organization of a microprocessor • Instruction execution cycle and fetch-decode-execute process 2. Assembly Language Programming Basics: • Introduction to assembly language and its advantages • Assembly language syntax and program structure • Data representation and addressing modes • Instruction formats and mnemonics 3. Instruction Set Architecture (ISA): • Overview of ISA and its importance • Categories of instructions: data transfer, arithmetic/logic, control flow • Register organization and addressing modes • Examples of commonly used instructions 4. Memory and I/O Operations: • Memory hierarchy and memory addressing modes • Data transfer between memory and registers • I/O interfacing: ports, memory-mapped I/O, I/O instructions • Interrupts and interrupt handling mechanisms

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.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	136	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	200		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	5% (5)	5, 10	LO #1, 2, 10 and 11
	Assignments	1	5% (5)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	15	20% (20)	Continuous	All
	Report	1	5% (5)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2hr	15% (15)	7	LO # 1-7
	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 Microprocessor
Week 2	Types of Microprocessor
Week 3	Component of Microprocessor
Week 4	8085 PIN description
Week 5	Instruction set and execution in 8085
Week 6	Store Instruction
Week 7	Arithmetic Instruction
Week 8	Arithmetic Instruction
Week 9	Logic Instruction
Week 10	Branch Instruction
Week 11	Control Instruction
Week 12	Instruction execution and time diagram
Week 13	Memory Write Machine Cycle
Week 14	8085 Interrupt
Week 15	Interrupt Structure
Week 16	

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered

Week 1	Introduction to 8085
Week 2	Familiarize students with the 8085 microprocessor, its architecture, and instruction set by writing a program to perform simple arithmetic operations.
Week 3	Memory Operations: Write a program to read data from a specific memory location,
Week 4	Memory Operations : perform arithmetic operations, and store the result in another memory location.
Week 5	I/O Port Programming: Interface 8085 with input and output devices (e.g., LEDs, switches) and write programs to read input from switches and display output on LEDs.
Week 6	Arithmetic Operations: Write programs to perform arithmetic operations like addition, subtraction.
Week 7	Arithmetic Operations: multiplication, and division on 8-bit data using the 8085 microprocessor.
Week 8	Logic Operations: Implement logic operations such as AND, OR.
Week 9	Logic Operations: Implement logic operations such as NAND, NOR , XOR, and NOT using 8085 instructions and test them with different input values.
Week 10	Introduction to Conditional Branching
Week 11	Conditional Branching: Write programs to implement conditional branching and looping constructs (e.g., IF-ELSE, WHILE, FOR) using 8085 assembly language.
Week 12	Subroutines and Stack: Write programs that demonstrate the use of subroutines and the stack to perform tasks such as factorial calculation, sorting, or searching.
Week 13	sorting, or searching algorithm using assembly language
Week 14	Introduction to Interrupt
Week 15	Interrupt Handling: Implement interrupt-driven programs using the 8085 microprocessor to handle external interrupts (e.g., from a push-button) and perform specific actions.

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	• **The 8086 Microprocessor: Programming & Interfacing the PC by Kenneth Ayala , 2007** • **Microprocessor Architecture, Programming, and Applications with the 8085 by Gaonkar, 2013** • **MICROPROCESSOR 8085 AND ITS INTERFACING 2nd edition, by Sunil Mathur 2011**	
Recommended Texts	• "Microprocessor Architecture, Programming, and Applications with 8085" by R. S. Salaria	
Websites	• http://www.8085projects.info • (https://www.tutorialspoint.com/assembly_programming/index.html	

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

Note: Marks 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.

Module Information
معلومات المادة الدراسية

Module Title	Systems for Community Development	**Module Delivery**
Module Type	C	☒ Theory ☒ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	CS213	
ECTS Credits	4	
SWL (hr/sem)	100	

Module Level	2	**Semester of Delivery**	3
Administering Department	CS	**College**	CSI
Module Leader	Gaith Hakim	**e-mail**	E-mail
Module Leader's Acad. Title	Lecturer	**Module Leader's Qualification**	Master
Module Tutor	Name (if available)	**e-mail**	E-mail
Peer Reviewer Name	Haider Hussein	**e-mail**	E-mail
Scientific Committee Approval Date	01/06/2023	**Version Number**	1.0

Relation with other Modules
العلاقة مع المواد الدراسية الأخرى

Prerequisite module	CS111	**Semester**	1
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. The course aims to introduce students to the concept and nature of management. 2. Introducing the student to the concept and principles of electronic management. 3. Introducing the student to the scientific concept of human development with its administrative activities at the level of organizations. 4. Providing the student with intellectual skills that he can harness in his study of other scientific subjects at the higher specialized scientific levels.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	• Acquisition of the vocabulary explained • Familiarity with the basics of electronic management, and the ability to simulate the electronic management model on the ground. • Enabling the student to know the advantages of electronic management. • Provide the student with the skill of working within a team. • Enhancing the student's ability to know and study the institutions' needs for future skills and knowledge
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Part A provide the student with an overview of the concept and nature of management. The student will be able to identify the development of schools of management thought. The student will be able to understand the contemporary approaches to management (the systems approach and the situational approach). Learn the basic concepts of the basics of electronic management. Part B - Methods of developing human resources and how to deal with human forces. Studying the requirements and means to be taken into consideration for the development of human resources. Human resource development mechanisms and human resource development theories.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in the delivery of this course is to encourage students to participate and raise the spirit of competition, while improving and expanding their critical

	thinking skills at the same time. This will be achieved through classes and interactive tutorials

Student Workload (SWL)
الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	32	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	68	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

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, 10 and 11
	Assignments	1	5% (5)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.				
	Report	1	5% (5)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	30% (30)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction - Understand the concept and what is management, The development of schools of management thought
Week 2	The electronic school in management, the concept and principles of electronic management

Week 3	Fundamentals of electronic management, electronic management model
Week 4	Infrastructure and electronic management services,
Week 5	Elements of electronic management and areas of application, The importance of the human element for the application of electronic management
Week 6	Characteristics of human resource development
Week 7	Human resources development goals.
Week 8	The need for human resource development.
Week 9	Human resource planning.
Week 10	Human resource management strategy
Week 11	Introductions and responsibilities of human development
Week 12	Human resource development requirements
Week 13	Factors affecting the development of human resources.
Week 14	Human resources development mechanisms
Week 15	**Human resource development theories.**
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Human resource development theories	Yes
Recommended Texts	Human resource development and its role in activating electronic management - Master Thesis	No
Websites	https://www.coursera.org/learn/managing-human-resources-ar?	

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

Note: Marks 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.

Module Information
معلومات المادة الدراسية

Module Title	**طرق عددية Numerical Methods**			**Module Delivery**	
Module Type	**Basic**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**CSI211**				
ECTS Credits	**6**				
SWL (hr/sem)	**150**				
Module Level	2		**Semester of Delivery**	3	
Administering Department	CS		**College**	CSI	
Module Leader	Firas Hussein		**e-mail**	E-mail	
Module Leader's Acad. Title	Assist. Professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Alaa Hussein		**e-mail**	E-mail	
Scientific Committee Approval Date	01/06/2023		**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	1. Numerical analysis is used to solve mathematical equations that are difficult to solve or require a long time to solve. 2. Saving time and effort, especially in equations that need a lot of repetition in order to reach the result or solution 3. The ability to collect, classify, tabulate, represent and interpret quantitative and numerical data 4. Generalization of numerical mathematical superlatives to symbolic phrases. 5. The ability to build mathematical models. 6. Using different ways of thinking and the ability to judge the correctness and reasonableness of the solution
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Introducing the concepts of different numerical methods, the difference between them and the characteristics of each one. 2. Apply the concepts of numerical methods. 3. Realizing the importance of the concepts of numerical methods in practical life. 4. Developing students' concepts of numerical methods. 5. Trying to reach new numerical concepts. 6. Giving the student the skill and ability to solve complex mathematical problems related to the class. 7. Provide the student with the necessary skill to build mathematical models.

	8. Developing the student's skill in proper mathematical thinking, which reflects positively on solving programming problems facing students.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Part A - Solution methods Learn the method of discussing issues scientifically by asking and answering questions The ability to implement numerical methods for the various subjects taught by the student using the computer The ability to discuss and compare computational results Provide the student with the skill of completing and approximating using polynomials Learn the method of discussing issues scientifically by asking and answering questions The ability to use different numerical methods in solving nonlinear equations, analyze the error associated with these methods and solutions, calculate the convergence rate Solving nonlinear equations using different numerical methods (Bisection method, fixed point, Newton, modified Newton, secant) and analyzing the error related to these methods, calculating the convergence rate for the iterative methods Solving systems of linear equations (direct methods (Gaussian method and trigonometric analysis) and repetition methods (Jacobi and Gauss-Seidel method), error analysis of recurrence methods, defining our residual product and number of condition and how to distinguish between a good and a linear system Part B - application and skill Fundamentals Solving systems of linear equations by direct methods and iterative methods The ability to write algorithms to solve various problems and implement them by computer Applying numerical methods in solving some mathematical models that appear in daily life, differentiating between actual solutions and approximate numerical solutions The ability to use different numerical methods in solving nonlinear equations, analyze the error associated with these methods and solutions, calculate the convergence

	rate.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1. Giving scientific lectures in classrooms and using the (Data Show) for the purpose of clarifying the main ideas of the subject and linking the theoretical aspect with practical examples in the laboratory. 2. Guiding students to some websites to benefit from them. 3. Assigning the student to prepare brief reports on some topics. 4. .4Scientific discussion inside the hall.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ أسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	86	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
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	5% (5)		
	Assignments	1	5% (5)		
	Projects / Lab.	15	20% (20)		

Summative assessment	**Midterm Exam**	1	5% (5)		
	Final Exam	2hr	50% (50)		
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to Numerical Methods
Week 2	Relative error, absolute error, inherent error, omitted error
Week 3	Non-Linear Equation
Week 4	Numerical Methods for Solving Non-linear Equations: Bisection Method, False Mode, Fixed Point Method, Newton's Method, Sequential Method, Modified Newton's Formula
Week 5	Convergence rate and error analysis, Newton's method for solving a system of nonlinear equations
Week 6	System of linear Equations
Week 7	Solving Systems of Linear Equations: Direct Methods: Gaussian Elimination, Factoring Method for Upper and Lower Triangular Matrices
Week 8	Iterative methods: Jacobi method, Gauss-Siddal method for error analysis in solving systems of linear equations
Week 9	Completion and approximation with polynomials Grange's complement formula, division differences, Newton's formulas for interpolation, error analysis in polynomial interpolation
Week 10	Differential - first derivative: two-point formula, three-point formulas anterior, central,posterior
Week 11	The second derivative: the three-point formula, the central formula
Week 12	Ordinary Differential Equations: Euler's Method and Improved Euler's Method
Week 13	Rung Kuta method of second and fourth order and ordinary differential equations of higher

	order
Week 14	Definite integration: method of rectangles, method of trapezoids
Week 15	Simpson's method and error analysis these methods

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Finding the actual and relative error using the computer
Week 2	Solving nonlinear equations using the bisection and fixed point method using the computer
Week 3	Solving nonlinear equations using Newton's method, modified Newton's secant method using the computer
Week 4	Solving nonlinear equations, analyzing the error related to the previous methods, and calculating the convergence rate for the iterative methods using the computer.
Week 5	Solving systems of linear equations (directly) using the Gaussian method and trigonometric analysis using the computer
Week 6	Solving systems of linear equations (and iteration methods) using the Jacobi and Gauss-Seidel method using the computer
Week 7	Solving systems of linear equations Error analysis of the previous iteration methods using the computer
Week 8	How to distinguish between a good and a bad linear system using a computer
Week 9	Completion and approximation using polynomials Grange's complement formula, division differences using the computer
Week 10	Completion and approximation using Newton's formula for interpolation and error analysis

	in polynomial interpolation using the computer
Week 11	Ordinary differential equations: Using Euler's method in the computer
Week 12	Using the improved Euler method in the computer
Week 13	Runge Kuta method in the computer
Week 14	Application of the method of rectangles, the method of trapezoids in the computer
Week 15	Simpson's method and error analysis These methods and their application in the computer

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	K, Atkinson, Elementary numerical analysis, john Wiley, 1985.	
Recommended Texts	https://www.coursera.org/campus?utm_content=corp-to-landing-for-campus&utm_campaign=website&utm_medium=coursera&utm_source=header&utm_term=b-out	
Required Texts	Numerical analysis James. Buchanan, Peter R. Turner 1992 McGraw-Hill College	

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

Note: Marks 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.

Module Information
معلومات المادة الدراسية

Module Title	**Design and Analysis of Algorithms**	**Module Delivery**	
Module Type	**Core**	☒ **Theory**	
Module Code	CS214	☒ **Lecture**	
ECTS Credits	4	☐ **Lab**	
SWL (hr/sem)	100	☐ **Tutorial**	
		☐ **Practical**	
		☐ **Seminar**	

Module Level	2	**Semester of Delivery**	3
Administering Department	CS	**College**	CSI
Module Leader	Ali Obeid Sharrad	**e-mail**	E-mail
Module Leader's Acad. Title	Professor	**Module Leader's Qualification**	Ph.D.
Module Tutor	Name (if available)	**e-mail**	E-mail
Peer Reviewer Name	Qusay O. Mosa	**e-mail**	Qusay.mosa@qu.edu.iq
Scientific Committee Approval Date	/06/2023	**Version Number**	1.0

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	CSI111	**Semester**	1
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. provide students with in-depth knowledge on algorithm design techniques; 2. introduce and practice advanced algorithms for various data types.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Upon completion of the subject, students will be able to: 1. Understand common techniques for designing algorithms; 2. acquire the skills to design efficient algorithms for solving computational problems; 3. Analyze and compare the efficiency of algorithms; 4. design and implement efficient algorithms for solving computing problems 5. Solve problems independently 6. Think critically for improvement in solutions
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. • Introduction to Algorithms: Introduce the idea of an algorithm, Documenting an algorithm and the use of pseudo code, Introduction to algorithm analysis. [4 hrs] • Analysis of algorithms: Mathematical techniques; big-O notation; efficiency analysis; recurring relations. [4 hrs] • Fundamental Algorithmic Problems: Searching, Sorting, String searching, Graph problems [4 hrs] • Algorithm Analysis: Asymptotic analysis of upper and average complexity bounds, Identifying differences among best, average, and worst case behaviours, Standard

	complexity classes, Using recurrence relations to analyze recursive algorithms, NP Complete problems [10 hrs] • Algorithm Design Techniques: General ideas for algorithm development, Brute-force algorithms, Divide-and-conquer, Dynamic programming, Greedy algorithms,[10 hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Lectures provide students the main concepts of the topic, together with comprehensive examples for easy understanding. 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..

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	32	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	68	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

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, 10 and 11
	Assignments	1	5% (5)	2, 12	LO # 3, 4, 6 and 7
	Projects /				
	Report	1	5% (5)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	2 hr	30% (30)	7	LO # 1-7
	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 Algorithms: Introduce the idea of an algorithm
Week 2	Documenting an algorithm and the use of pseudo code, Introduction to algorithm analysis.
Week 3	Analysis of algorithms: Mathematical techniques;
Week 4	Big-O notation; efficiency analysis; recurring relations.
Week 5	Fundamental Algorithmic Problems: Searching, Sorting,
Week 6	Fundamental Algorithmic Problems: String searching, Graph problems

Week 7	Mid-term Exam + Unit-Step Forcing, Forced Response, the RLC Circuit
Week 8	Algorithm Analysis: Asymptotic analysis of upper and average complexity bounds
Week 9	Algorithm Analysis: Identifying differences among best, average, and worst case behaviours
Week 10	Algorithm Analysis: Standard complexity classes, Using recurrence relations to analyze recursive algorithms, NP Complete problems
Week 11	Algorithm Design Techniques: General ideas for algorithm development
Week 12	Algorithm Design Techniques: Brute-force algorithms
Week 13	Algorithm Design Techniques: Divide-and-conquer,
Week 14	Algorithm Design Techniques: Dynamic Programming
Week 15	Algorithm Design Techniques: Greedy algorithms
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	, Introduction to Algorithms, 3rd Edition, MIT Press, 2009.Cormen, Thomas H., Leiserson, Charles E., Rivest, Ronald L. and Stein, Clifford	Yes
Recommended Texts	Algorithm design. Addison-Wesley 2006, Jon M. Kleinberg, Éva TardosISBN 978-0-321-37291-8.	No
Websites	https://www.programiz.com/dsa/algorithm • https://www.tutorialspoint.com/data_struc tures_algorithms/index.htm	

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

Note: Marks 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.

Module Information معلومات المادة الدراسية					
Module Title	Data structure			Module Delivery	
Module Type	C			Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	CS221				
ECTS Credits	8				
SWL (hr/sem)	200				
Module Level	2		Semester of Delivery	3	
Administering Department	CS		College	CSI	
Module Leader	Luma Salal		e-mail		
Module Leader's Acad. Title	Assist.Professor		Module Leader's Qualification	Ph.D.	
Module Tutor	Name (if available)		e-mail	E-mail	
Peer Reviewer Name	Farah Jawad		e-mail		

Scientific Committee Approval Date	01/06/2023	Version Number	1.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	CSI111	Semester	1
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	1. Understanding the graphic types that can be used when dealing with the computer 2. •Understand the graphic structures that can be used to facilitate the process of dealing with the problem 3. •View the graphic structures in detail and explain how each one works and how to add and delete them. 4. •Presentation of search and arrangement algorithms and how to program them in the laboratory. 5. •Teaching students how to program algorithms for graphic structures in scientific laboratories using the C++ language
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Recognize and understand graphic structures 2. Recognize and understand algorithms in the field of data structures. 3. Recognize and understand useful applications of data structures 4. Identify and understand the possible types of operations on each graphic structure. 5. Learn and understand search and ranking algorithms. 6. Developing the student's skill in writing programs and choosing the appropriate structure to solve programming problems. 7. Providing the student with the necessary skill to choose the appropriate algorithm to deal with the required issue. 8. Developing the student's skill in developing algorithms to deal with different cases. 9. Providing the student with the skill of writing efficient programs to

	implement algorithms.
Indicative Contents المحتويات الإرشادية	1. At the beginning of this course, we learn about graphic structures and their definition, then we move to data types, and then we determine what are the mechanisms by which we identify how to choose the appropriate graphic structure. 2. Then we move on to explaining the graphic structures in detail and start with the matrix 3. Explain the one-dimensional array and the two-dimensional array, how to calculate their addresses, and how to store them in memory 4. Explain the stack, operations on the stack, and implementations of the stack 5. Explain queuing and operations on queuing 6. Explanation of the linked list and its types and operations 7. Explain the concept of tree and binary search tree and how to use them as a graphical structure 8. Explanation of search algorithms and ranking algorithms

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1. Giving scientific lectures in classrooms and using the (Data Show) for the purpose of clarifying the main ideas of the subject. 2. Using a computer to implement programs. 3. Guiding students to some websites to benefit from them. 4. Assigning the student to implement a set of programs in the practical laboratories. 5. Assign the student to prepare brief reports on some topics and carry out homework.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ أسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4.27
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	136	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	9.1
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	200		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	5% (5)	5 and 10	LO #1, #2 and #10, #11
	Assignments	1	5% (5)	6	LO #3, #4 and #6, #7
	Projects / Lab.	15	20% (20)	Continuous	All
	Reports	1	5% (5)		
Summative assessment	Midterm Exam	2hr	15% (15)	7	LO #1 - #7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	General concepts
Week 2	Matrices and their types
Week 3	The concept of constraint
Week 4	stack concept
Week 5	The concept of arithmetic expressions

Week 6	stack applications
Week 7	stack applications
Week 8	Queue concept
Week 9	The concept of linked list and its types
Week 10	The circular and double linked list
Week 11	tree concept
Week 12	Binary search tree
Week 13	Binary search tree
Week 14	Search concept and search algorithms
Week 15	Search concept and search algorithms

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	General concepts
Week 2	Matrices and their types
Week 3	The concept of constraint
Week 4	stack concept
Week 5	The concept of arithmetic expressions
Week 6	stack applications
Week 7	Queue concept
Week 8	The concept of linked list and its types
Week 9	The circular and double linked list
Week 10	tree concept

Week 11	Binary search tree
Week 12	The concept of ranking and search algorithms
Week 13	The concept of ranking and search algorithms
Week 14	Search concept and search algorithms
Week 15	Search concept and search algorithms

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Data structures and algorithms Made Easy, 2017	
Recommended Texts	Data structure and Algorithmic Thinking with Python, 2016	

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

Note: Marks 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.

Module Information
معلومات المادة الدراسية

Module Title	**Java Programming**		**Module Delivery**	
Module Type	**E**		☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**CS222**			
ECTS Credits	**6**			
SWL (hr/sem)	**150**			
Module Level	2		**Semester of Delivery**	4
Administering Department	CS		**College**	CSI
Module Leader	Ahmed Mohammed Abbas		**e-mail**	ahmed.alshammari@qu.edu.iq
Module Leader's Acad. Title	Lecturer		**Module Leader's Qualification**	Ph.D.
Module Tutor	Name (if available)		**e-mail**	E-mail
Peer Reviewer Name	Mohammed iqbal dohan		**e-mail**	mohammed.iqbal@qu.edu.iq
Scientific Committee Approval Date	01/06/2023		**Version Number**	1.0

Relation with other Modules
العلاقة مع المواد الدراسية الأخرى

Prerequisite module	CSI121	**Semester**	2
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. This course deals with the basic concept of Java programming Language. 2. To understand the principles of programming in the Java language 3. To understand input and output operations, conditional statements, loops, arrays, and strings, and functions 4. To understand objects, classes, OOP 5. To understand programming applications in Java.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Enabling the student to know the basics of programming in the Java language. 2. Enabling the student to know the principle of input and output operations. 3. Enabling the student to know the benefits, operations, conditional statements, loops, and arrays. 4. Enabling the student to know: strings, the principle of class, object, OOP programming. 5. Enabling the student to acquire the skills of dealing with programming conditional statements, loops, and arrays 6. Enabling the student to acquire buffering skills
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. 1. Introduction and Fundamentals of Java Report +presentation (2 weeks) 2. Conditional statements Project+ presentation (3 weeks) 3. Classes, types, characteristics Project+ presentation

	(3 weeks) 4. Functions in Java Report+ presentation (2 weeks) 5. Operations on files Project+ presentation (2 weeks) 6- Overloading and overriding Report (1 week) 7- Drawing functions Project+ Presentation (2 weeks)

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in delivering this module (Java Programming) 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.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	86	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
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	5% (5)	5, 10	LO #1, 2, 10 and 11
	Assignments	1	5% (5)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	15	20% (20)	Continuous	All
	Report	1	5% (5)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2hr	15% (15)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction and definition of Java programming style and its characteristics
Week 2	Fundamentals of Java language
Week 3	Understand how to use conditional statements, and their characteristics

Week 4	Using conditional statements programmatically
Week 5	Using of Classes, types, characteristics of each type
Week 6	Review
Week 7	How to build functions
Week 8	Using functions programmatically and their relationship to the class
Week 9	How to build objects and their benefits
Week 10	How to use files, types of files
Week 11	Operations on files
Week 12	Review
Week 13	how to use Java language in drawing
Week 14	Functions of drawing in Java
Week 15	Difference between overloading and overriding
Week 16	**Final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Introduction to Java programming Language
Week 2	Lab 2: Using eclipse or Netbean platform, writing first programs
Week 3	Lab 3: How to define variables, string, arrays
Week 4	Lab 4: Types of Arrays
Week 5	Lab 5: Review
Week 6	Lab 6: Introduction to Control statements
Week 7	Lab 7: IF statement, Switch, break, go to, continue

Week 8	Lab 8: Loop statements For, while, do while
Week 9	Lab 9: Classes and types
Week 10	Lab 10: How to use functions
Week 11	Lab 11: Types of functions
Week 12	Lab 12: Review
Week 13	Lab 13: How to use files in Java, and types
Week 14	Lab 14: Drawing in Java, Instructions and programs
Week 15	Final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Introduction to Programming Using Java, Sixth Edition.	Yes
Recommended Texts	• Java Programming Fundamental • Starting Out with Java: From Control Structures through Objects, 6th Edition, Tony Gaddis, Pearson, 2016. ISBN-13: 9780133957051	No
Websites	https://www.coursera.org/specializations/java-programming	

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

Note: Marks 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.

Module Information
معلومات المادة الدراسية

Module Title	**Computation Theory**	**Module Delivery**	
Module Type	**C**	☒ **Theory**	
Module Code	**CS223**	☒ **Lecture**	
ECTS Credits	**4**	☐ **Lab**	
SWL (hr/sem)	**100**	☐ **Tutorial**	
		☐ **Practical**	
		☐ **Seminar**	

Module Level	2	**Semester of Delivery**	4
Administering Department	CS	**College**	CSI
Module Leader	Rafid Nabeel	**e-mail**	E-mail
Module Leader's Acad. Title	Assist. Professor	**Module Leader's Qualification**	Master
Module Tutor	Name (if available)	**e-mail**	E-mail
Peer Reviewer Name	Mohammed Iqbal	**e-mail**	E-mail
Scientific Committee Approval	01/06/2023	**Version Number**	1.0

Date			

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	**CSI122**	**Semester**	**2**
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	The aim of this course is to introduce students to this core area of computer science which enables students to focus on the study of mathematical models. These mathematical models allow students to solve various problems in the language construction process. Allows students to learn about mathematical theories, where mathematical data is processed and proofs are formulated, and regular arithmetic expressions are used to distinguish patterns to represent language. The student can also know the different processes that occur in languages and gives him the ability to think logically in building algorithms.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Clarifying the basic concepts in computational theory through a set of tools. 2. Acquisition of skills in problem solving. 3. Acquisition of basic skills as an introduction to building languages. 4. Know the comparison between (Natural and Formal languages). 5. Acquisition of theoretical concepts to deal with (RE's, DFA's, NFA's, Stack's, Grammars, Turing Machines). 6. The ability to design (FA's, NFA's, Grammars, Languages modeling, Small Compilers basics). 7. The ability to think about solving a problem according to certain rules. 8. Writing scientific reports & find solutions for assignments.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following.

	Part A – Introduction to Computation Theory Introduction to Languages – Types of Languages, comparison of different languages, Symbols of languages, Set, string, alphabets, Natural and formal languages [10 hrs] Introduction to FA's – Finite state automata, Types of NFAs, DFAs, Types of NFAs, DFAs and equivalence between NFAs and DFAs, FAs with epsilon move, Finite State Automata with output(Mealy and Moore)Machine, Equivalence between Moore and Mealy Machine, Kleen's Theorem, Regular Expressions, Pumping lemma on regular languages, closure properties of regular languages [26 hrs] Part B - Introduction to CFG's Context Free Grammar and Languages, Context Free Grammar without empty string, Derivation Tree (LMD,RMD), Simplification of CFGs, Chomsky and Greibach normal form, The ambiguous CFGs [20 hrs] Pushdown automata and CFL, closure properties of CFL (union, concatenation, kleen closure), Turing Machine [10 hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1. Giving scientific lectures in classrooms and using the (Data Show) for the purpose of explaining the vocabulary of the curricula prepared for the subject. 2. Guiding students to some websites to benefit from them. 3. Assign the student to prepare reports on some topics and analyze different systems. 4. Panel discussions to address the problems that the student faces in the course. 5. Carry out daily duties. 6. Implementation of electronic tests for students. 7. Daily, monthly and final exams. 8. Giving importance to group activities by assigning specific grades to

	activities and group work. 9. Managing the lecture in a way that makes the student feel the importance of time. 10. Enable the student to link between the previous and subsequent topics, since the process of building the system represents one case. 11. Encourage the student to present ideas in the field of specialization that keep pace with quality standards in community service. 12. Using important means of clarification in the lecture to facilitate the delivery of the material and increase understanding and linking between topics.

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	32	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	68	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	5% (5)	5, 10	LO #1, 2, 10
	Assignments	1	5% (5)	2, 12	LO # 3, 4, 6 and 7
	Report	15	20% (20)	14	LO # 5, 8 and 10
Summative	**Midterm Exam**	1	5% (5)	8	LO # 1-8

assessment	**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 Languages: Set, string, alphabets, language
Week 2	Introduction to FA's: Finite state automata
Week 3	Introduction to FA's: Types of NFAs, DFAs and equivalence between NFAs and DFAs, FAs with epsilon move
Week 4	Introduction to Regular Expressions: Regular Expressions
Week 5	Introduction to Regular Expressions: Pumping lemma on regular languages, closure properties of regular languages
Week 6	FA with output: Finite State Automata with output(Mealy and Moore) Machine
Week 7	FA with output: Equivalence between Moore and Mealy Machine
Week 8	**Midterm Exam**
Week 9	Represent REs, FAs, TGs: Kleen's Theorem
Week 10	Introduction to CFG's: Context Free Grammar and Languages, Context Free Grammar without empty string
Week 11	CFG's: Derivation Tree (LMD,RMD), Simplification of CFGs
Week 12	CFG's: Chomsky and Greibach normal form
Week 13	CFG's: The ambiguous CFGs
Week 14	CFL's: Pushdown automata and CFL, closure properties of CFL(union, concatenation, kleen closure)
Week 15	TM's: Turing Machine

Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	John E. Hopcroft, Rajeev Motwani, Jeffrey D. Ullman, "Introduction to Automata Theory, Languages, and Computation", Second Edition, Prentice- Hall, 2010.	Yes
Recommended Texts	Papadimitriou, Elements of the Theory of Computation, Prentice-Hall, 1998.	Yes
Websites	https://www.e-booksdirectory.com/computer-science.php	

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

Note: Marks 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.

Module Information
معلومات المادة الدراسية

Module Title	**Computer Architecture**	**Module Delivery**	
Module Type	**C**	☒ **Theory**	
Module Code	**CS224**	☒ **Lecture**	
ECTS Credits	**4**	☐ **Lab**	
SWL (hr/sem)	**100**	☐ **Tutorial**	
		☐ **Practical**	
		☐ **Seminar**	

Module Level	2	**Semester of Delivery**	4
Administering Department	CS	**College**	CSI
Module Leader	Saad Hussein	**e-mail**	
Module Leader's Acad. Title	Assist. Lecturer	**Module Leader's Qualification**	Master
Module Tutor	None	**e-mail**	None
Peer Reviewer Name	Farah Jawad	**e-mail**	
Scientific Committee Approval Date	01/06/2023	**Version Number**	1.0

Relation with other Modules
العلاقة مع المواد الدراسية الأخرى

Prerequisite module	CS121	**Semester**	2

Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	• Learn the basic principles of computer architecture. • Knowledge of computer components. • Understand the memory management. • Knowledge of ways to transfer information between computer parts. • Exposing the major differentials of different architectures. • Methods of interpreting and processing data.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	• Understand the concepts of computer architecture. • Introduce students to the parts of a computer. • Introducing the student to the field of data transfer. • Familiarity with computer components. • Knowledge of methods and algorithms for transferring data between computer parts. • Investigating modern design structures of Pipelined and Multiprocessors systems. • Become acquainted with recent computer architectures and I/O devices, as well as the low-level language required to drive/manage these types of advanced hardware.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Review of Basic Computer Architecture and Microprocessors; Von Neumann architecture: principles, Digital components, decoder, encoder, adder multiplexer, latches & flip-flop, registers & counters, timing diagrams, memory hierarchy, main memory organization and operations, CISC versus RISC architectures, subroutine call and return mechanism; Control unit: hardwired, micro-programmed, page table, TLB; I/O fundamentals: handshaking, buffering, programmed I/O, interrupts-driven I/O;

	Buses: types, bus protocols, arbitration, Direct Access Memory; Pipelining: principles, Instruction pipelines, Pipelines difficulties and solutions; Introduction to SIMD, MIMD.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in delivering this module is to encouraging students to benefit from the course by believing in the importance of the course in the educational process and in the field of specialization in general, enhancing cooperation between students through the implementation of practical duties, and developing intellectual and creative energies among students through their implementation of various duties, encouraging students, and raising the spirit of competition among them.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	32	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem)	68	**Unstructured SWL (h/w)**	4.5

الحمل الدراسي غير المنتظم للطالب خلال الفصل		الحمل الدراسي غير المنتظم للطالب أسبوعيا	
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

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
	Assignments	1	5% (5)	2, 12	LO # 3, 4
	Projects / Lab.				
	Report	1	5% (5)	13	LO # 5, 6
Summative assessment	Midterm Exam	2hr	30% (30)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Computer Organization
Week 2	Memory Types
Week 3	The Memory Hierarchy
Week 4	Cache Organization
Week 5	Memory Mapping Organization 1

Week 6	Memory Mapping Organization 2
Week 7	Replacement Algorithms
Week 8	The Instruction Cycle
Week 9	Instruction Pipelining
Week 10	Pipeline Hazards
Week 11	RISCs and CISCs
Week 12	RISC Architectures
Week 13	CISC Architectures
Week 14	Parallel Architectures
Week 15	Preparatory week before the final Exam
Week 16	Comprehensive exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	**Available in the Library?**
Required Texts	M. Morris Mano, "Computer System Architecture", 2002, Printest Hell.	Yes
Recommended Texts	*Modern Computer Architecture*. MURPHY & MOORE PUB; 2022.	No
Websites	Computer Architecture | Coursera	

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

Note: Marks 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.

Module Information معلومات المادة الدراسية					
Module Title	Statistics and Probability			**Module Delivery**	
Module Type	B			☒ **Theory** ☒ **Lecture** ☐ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	CSI221				
ECTS Credits	4				
SWL (hr/sem)	100				
Module Level	2		**Semester of Delivery**	4	
Administering Department	CS		**College**	CSI	
Module Leader	Alaa Hussein		**e-mail**		

Module Leader's Acad. Title	Assisnt Prof	**Module Leader's Qualification**	Ph.D.
Module Tutor	Name (if available)	**e-mail**	E-mail
Peer Reviewer Name	Ahmed Mohsin	**e-mail**	
Scientific Committee Approval Date	01/06/2023	**Version Number**	1.0

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	1-This course aims to provide the student with an overview of the principles and concepts of statistics and probability. 2- The student will be able to differentiate between quantitative and qualitative data and how to represent them. 3- Enable the student to know the types of distribution such as the normal distribution and use it to represent the types of probabilities. 4- Introducing students to modern topics in the principles of statistics and probability.
Module Learning Outcomes مخرجات التعلم للمادة	• Identify the types of quantitative and qualitative data. • Learn about data and data representation methods. • Enabling the student to know the basic functions provided by programming languages. • Identify the types of distribution and use it to represent the types of

الدراسية	probabilities. • The student acquires the skill of structural thinking and logical analysis of statistical and probability problems. • The possibility of finding the probability for each variable. • The possibility of finding the distribution of discrete and continuous random variables. • Encouraging students to benefit from the course by believing in the importance of the course in the educational process and in the field of specialization in general. • Developing the intellectual and creative energies of students through their implementation of various duties. • Encouraging students and raising the spirit of competition among them. • Developing the student's ability to deal with technical means. • Developing the student's ability to deal with the Internet. • Developing the student's ability to learn ways and means of personal development beyond the course. • Develop the student's ability to dialogue and discussion. • Developing the spirit of creativity, perseverance and searching for new things in his field of work.
Indicative Contents المحتويات الإرشادية	<u>Part A – probability Theory</u> Introduction - General concepts of statistics Introduction to the topic of compatibility and permutations .Probability theory, probability laws with some applications Conditional probability, independence, Bayes' theorem and some of its applications (10hrs) Distribution Theory ,The use of distribution theory for a single random variable, definition of discrete and continuous variables .Some important functions are the probability density function, the distribution function, the mathematical expectation, and the variance.(10 hrs) Moments: special cases of moments, central absolute moments, and working moments. The moment generating function, study of the function and a special case of the moment generating function. Mode, median definitions and examples.(10hrs) Revision problem classes (6hrs) <u>Part B - probability distributions / Descriptive statistics</u>

	Some special distributions (discontinuous and distributions) common distribution. Joint distributions and joint distribution function joint probability density function, marginal. (10hrs) Conditional distribution, joint expectation, conditional expectation, variance, definition and examples. Probability distributions, discrete and continuous distribution. (10hrs) Descriptive statistics, frequency distribution. Measures of central tendency, arithmetic, geometric and harmonic mean. Mediator, definition and characteristics of the mediator and examples. Mode, mean deviation, and standard deviation definitions and examples. (12hrs)

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1- Giving scientific lectures in classrooms and using (Data show) to indicate the main ideas of the subject. 2- Data collection and reporting. 3- Directing students to some websites to benefit from them. 4- Assign students to solve a set of statistical questions through discussions among students 5- Assign the student to prepare brief reports on some topics and carry out homework. 6- Panel discussions to address the problems faced by the student in the course. 7- Giving importance to group activities by assigning grades to group activities. 8- Managing the lecture in a way that makes the student feel the importance of time. 9- Enabling the student to link the theoretical and practical aspects. 10- Encouraging the student to present creative works in the specialty that keep pace with quality standards in community service.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	32	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	68	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**100**		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	10% (10)	5 and 10	LO #1, #2 and #10, #11
	Assignments	1	5% (5)	2 and 12	LO #3, #4 and #6, #7
	Projects				
	Report	1	5% (5)	13	LO #5, #8 and #10
Summative assessment	**Midterm Exam**	2hr	30% (30)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered

Week 1	Introduction - General concepts of statistics Introduction to the topic of compatibility and permutations
Week 2	Probability theory, probability laws with some applications Conditional probability, independence, Bayes' theorem and some of its applications
Week 3	Distribution Theory ,The use of distribution theory for a single random variable, definition of discrete and continuous variables
Week 4	Some important functions are the probability density function, the distribution function, the mathematical expectation, and the variance
Week 5	Moments: special cases of moments, central absolute moments, and working moments
Week 6	The moment generating function, study of the function and a special case of the moment generating function
Week 7	Mid-term Exam + Mode, median definitions and examples
Week 8	Some special distributions (discontinuous and distributions) common distribution
Week 9	Joint distributions and joint distribution function joint probability density function, marginal
Week 10	Conditional distribution, joint expectation, conditional expectation, variance, definition and examples
Week 11	Probability distributions, discrete and continuous distribution
Week 12	Descriptive statistics, frequency distribution
Week 13	Measures of central tendency, arithmetic, geometric and harmonic mean
Week 14	Mediator, definition and characteristics of the mediator and examples
Week 15	Mode, mean deviation, and standard deviation definitions and examples
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	• Data structure and Algorithmic Thinking with Python, 2016. • Introduction to mathematics statics (Hogg and Grug) . • Elment of mathematical statics (Ractliffe)	Yes
Recommended Texts	• مبادئ الاحصاء التطبيقي لغير الاختصاص /تأليف غازي عطية زراك	No
Websites	https://www.coursera.org/browse/physical-science-and-engineering/electrical-engineering	

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

Note: Marks 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.

Module Information

معلومات المادة الدراسية

Module Title	**English 2**			**Module Delivery**	
Module Type	**S**			☒ **Theory** ☒ **Lecture** ☐ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**UNV221**				
ECTS Credits	**4**				
SWL (hr/sem)	**100**				
Module Level	2		**Semester of Delivery**	4	
Administering Department	CS		**College**	CSI	
Module Leader	Maitham Abdalhamza		**e-mail**	E-mail	
Module Leader's Acad. Title	Assist. Lecturer		**Module Leader's Qualification**	Master	
Module Tutor			**e-mail**		
Peer Reviewer Name	Qaiser Abid		**e-mail**	E-mail	
Scientific Committee Approval Date	01/06/2023		**Version Number**	1.0	

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	None	**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-The aim of this course is to provide English learners with integrated

	language skills such as reading, listening and writing resulting in a level of basic language knowledge. 2-This course will focus on grammar rules, devloping word knowledge and usage, reading comprehension, reading out of the lesson, and Paragraph writing. 3- A student may be able to listen to native speakers and speak English Language. 4- A student may be able to write and have creativity in his writing.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- Uses expressions of Quantity in elementary level of English. 2- Constructs sentences in Present Perfect Tense, Simple Future Tense and Going to Future Tense both in an oral and written task. 3- Defines basic Modals and employ them in elementary level of communication and writing skills. 4- Translates sentences in elementary level from English to another language. 5- Interprets the texts written in elementary level of English. **6-Language** is a rule-governed behavior. It is defined as the comprehension and/or use of a spoken (i.e., listening and speaking), written (i.e., reading and writing), and/or **other communication symbol system** (e.g., American Sign Language). **7-Spoken and written language** are composed of receptive (i.e., listening and reading) and expressive (i.e., speaking and writing) components. Spoken language, written language, and their associated components (i.e., receptive and expressive) are each a synergistic system comprised of individual language domains (i.e., phonology, morphology, syntax, semantics, pragmatics) that form a dynamic integrative whole
Indicative Contents المحتويات الإرشادية	4- Listening 5- Grammar 6- Writing skill 7- Reading skills

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1- Uses the available material to increase his efficiency. 2- Constructs sentences in Present Perfect Tense, Simple Future Tense and Going to Future Tense both in an oral and written task. 3-Defines basic Modals and employ them in elementary level of communication and writing skills. 4- Develop and enhance students' language skills to communicate in English properly. 5- Interprets the texts written in elementary level of English.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	32	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	68	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

Module Evaluation تقييم المادة الدراسية				
	Time/Nu	**Weight (Marks)**	**Week Due**	**Relevant Learning**

		mber			Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	1	5% (5)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.				
	Report	1	5% (5)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	2 hr	30% (30)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Getting to Know you
Week 2	The way we live
Week 3	It all went wrong
Week 4	Let's go shopping
Week 5	What do you want to do?
Week 6	Tell me! What's it like?
Week 7	Mid term test, revision and more examples
Week 8	Present Perfect, Fame
Week 9	Do's and don'ts
Week 10	Going Places(Time clauses)
Week 11	Scared to death (Verb Patterns)

Week 12	Things that Changed the world
Week 13	Earning a living
Week 14	Family ties
Week 15	Preparation for final exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Soars & John, (2019). New Headway plus (Pre-Intermediate)Oxford University Press.	Yes
Recommended Texts		
Websites	https://www.bbc.co.uk/learningenglish/	

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

Note: Marks 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.

Module Information
معلومات المادة الدراسية

Module Title	**Software Engineering**			**Module Delivery**	
Module Type	**C**			☒ **Theory**	
Module Code	**CS311**			☒ **Lecture**	
ECTS Credits	**4**			☐ **Lab**	
SWL (hr/sem)	**100**			☐ **Tutorial**	
				☐ **Practical**	
				☐ **Seminar**	
Module Level	3		**Semester of Delivery**	5	
Administering Department	CS		**College**	CSI	
Module Leader	Mustafa Yahya		**e-mail**	E-mail	
Module Leader's Acad. Title	Assist. Lecturer		**Module Leader's Qualification**	Master	
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Ali Hakim		**e-mail**	E-mail	
Scientific Committee Approval Date	01/06/2023		**Version Number**	1.0	

Relation with other Modules
العلاقة مع المواد الدراسية الأخرى

Prerequisite module	**CS111**	**Semester**	**1**
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. Provide students with a comprehensive introduction to software engineering. 2. Provide students with the types of activities needed to produce the system. 3. Study the important stages of software development. 4. Building a high quality software system. 5. Explain the system build life cycle. 6. Gain knowledge at every stage of building the system. 7. Understand the application of software engineering principles to a project.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Clarifying the basic concepts of software engineering principles and getting acquainted with a set of tools. 2. Gain skills in system building and problem solving. 3. Study techniques for deriving system requirements. 4. Studying the stages of building the system, the cost and the required time. 5. The ability to accurately build systems using software engineering principles. 6. The ability to think about addressing the problem according to quality standards. 7. Writing scientific reports. 8. Using advanced building models to obtain efficient software.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Part A - Fundamental of Software Engineering Basic Concepts: Software product, Software crisis, software engineering, software process, software process model, methodologies, methods, tools, artifacts, Software Process (I): process models, iterative process, Software Process (II): software process activities (specification, design and implementation ,validation/verification, evolution); Software Requirement Engineering (I) [16 hrs]

	Software requirements: Functional/Non Functional requirements, User requirements, System requirement, Requirement document, Software requirements elicitation, Software Requirement Engineering(II): Software requirement, elicitation and analysis, basics on Use case [6 hrs] System Model: System Models (I): Context models, Behavioural Models; System Models (II): Data Models, Objects Models, Uniform Modelling Language, Architectural Design: system structuring, control models, modular decomposition; Object Oriented Design, UML notation; User interface design: user interface design principles, user interaction [10 hrs] Part B - Risk Analysis Risk analysis concept and principles, Software Quality Assurance, Software Quality Assurance, Quality control, Software Testing, Software Testing ,Verification and Validation: planning, software Inspections, defect testing, integration testing.
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1. The ability to accurately build systems using software engineering principles. 2. The ability to think about addressing the problem according to quality standards. 3. Writing scientific reports. 4. Using advanced building models to obtain efficient software. 5. Directing students to some websites to benefit from them. 6. Assign the student to prepare brief reports on some topics and carry out homework. 7. Holding research seminars through which some problems are explained and analyzed and the mechanism for finding solutions to them. 8. Conducting theoretical tests in the classroom (daily, monthly, and final). 9. Asking questions and oral inquiries to the students to indicate the extent of their response. 10. Organizing students in groups and assigning them to complete the requirements of building a specific system and evaluating the percentage of their completion of these works.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	32	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	68	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	10% (10)	2, 10	LO #1, 2, 10 and 11
	Assignments	1	5% (5)	3, 12	LO # 3, 4, 6 and 7
	Report	1	5% (5)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	30% (30)	9	LO # 1-9
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Fundamental of Software Engineering, Basic Concepts: Software product, Software crisis, software engineering.
Week 2	Fundamental of Software Engineering, software process, software process model, methodologies, methods, tools, artifacts
Week 3	Software process, Software Process (I): process models, iterative process

Week 4	Software process, Software Process (II): software process activities (specification, design and implementation, validation/verification, evolution); Software Requirement Engineering (I)
Week 5	Software requirements, Functional/Non Functional requirements, User requirements, System requirement, Requirement document
Week 6	Software requirements elicitation, Software Requirement Engineering(II): Software requirement, elicitation and analysis, basics on Use case
Week 7	System Model, System Models (I): Context models, Behavioural Models ; System Models (II): Data Models, Objects Models
Week 8	Uniform Modelling Language, Architectural Design: system structuring, control models, modular decomposition; Object Oriented Design, UML notation; User interface design: user interface design principles, user interaction
Week 9	**Midterm-Exam**
Week 10	Risk Analysis, Risk analysis concept and principles
Week 11	Software Quality Assurance, Software Quality Assurance, Quality control
Week 12	Software Quality Assurance, Software Quality Assurance, Quality control
Week 13	Software Quality Assurance, Software Quality Assurance, Quality control
Week 14	Software Testing, Software Testing ,Verification and Validation: planning, software Inspections
Week 15	Software Testing, defect testing, integration testing
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Software Engineering, Roger S.Pressman, 2014	Yes
Recommended Texts	Introduction to Software Engineering, Ian Somerville, 2007	Yes

Websites	https://www.e-booksdirectory.com/computer-science.php

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

Note: Marks 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.

Module Information

معلومات المادة الدراسية

Module Title	Data Base	**Module Delivery**	
Module Type	**Core**	☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	CS312		
ECTS Credits	**8**		
SWL (hr/sem)	**200**		
Module Level	3	**Semester of Delivery**	5
Administering Department	CS	**College**	CSI

Module Leader	Lamia Abid Noor	**e-mail**	
Module Leader's Acad. Title	Profesor	**Module Leader's Qualification**	Ph.D.
Module Tutor		**e-mail**	
Peer Reviewer Name	Nisreen Riyadh	**e-mail**	
Scientific Committee Approval Date	01/06/2023	**Version Number**	1.0

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	CSI111	**Semester**	1
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	1. Understand the principles of databases and methods of design. 2. Understand what database management systems are. 3. Know the reasons that led to the emergence of distributed databases. 4. Knowledge of what architectures are available and used to build distributed database systems.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Introducing the principles and basics of distributed databases, systems and types. 2. Apply the concepts of distributed databases. 3. Realizing the importance of distributed database systems. 4. Determine the difference between database systems and distributed database systems. 5. The ability to describe distributed database systems. 6. The ability to deliver lectures related to distributed database systems.

	7. The ability to design a distributed database system. 8. The ability to learn and train on various traditional and distributed database systems. 9. The ability to manage dialogues and discussions related to database systems and distributed databases.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A - Circuit Theory</u> DC circuits – Current and voltage definitions, Passive sign convention and circuit elements, Combining resistive elements in series and parallel. Kirchhoff's laws and Ohm's law. Anatomy of a circuit, Network reduction, Introduction to mesh and nodal analysis. [15 hrs] AC circuits I – Time dependent signals, average and RMS values. Capacitance and inductance, energy storage elements, simple AC steady-state sinusoidal analysis. [15 hrs] AC Circuits II - Phasor diagrams, definition of complex impedance, AC circuit analysis with complex numbers. [10 hrs] RL, RC and RLC circuits - Frequency response of RLC circuits, simple filter and band-pass circuits, resonance and Q-factor, use of Bode plots, use of differential equations and their solutions. Time response (natural and step responses). Introduction to second order circuits. [15 hrs] Revision problem classes [6 hrs] <u>Part B - Analogue Electronics</u> Fundamentals Resistive networks, voltage and current sources, Thevenin and Norton equivalent circuits, current and voltage division, input resistance, output resistance, coupling and decoupling capacitors, maximum power transfer, RMS and power dissipation, current limiting and over voltage protection. [15 hrs]

	Components and active devices – Components vs elements and circuit modeling, real and ideal elements. Introduction to sensors and actuators, self-generating vs modulating type sensors, simple circuit interfacing. [7 hrs] Diodes and Diode circuits – Diode characteristics and equations, ideal vs real. Signal conditioning, clamping and clipping, rectification and peak detection, photodiodes, LEDs, Zener diodes, voltage stabilization, voltage reference, power supplies. [15 hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Type something like: 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 types of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	136	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	9
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	200		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	5% (5)	5 and 10	LO #1, #2 and #10, #11
	Assignments	1	5% (5)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab	15	20% (20)	Continuous	All
	Report	1	5% (5)	13	LO #5, #8 and #10
Summative assessment	Midterm Exam	2hr	15% (15)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Approaches to and evolution of database systems
Week 2	Approaches to and evolution of database systems
Week 3	Components of database systems
Week 4	Components of database systems
Week 5	Database architecture and data independence
Week 6	Database architecture and data independence

Week 7	Design of core DBMS functions (e.g., query mechanisms, transaction management, buffer management, access methods)
Week 8	Design of core DBMS functions (e.g., query mechanisms, transaction management, buffer management,access methods)
Week 9	Design of core DBMS functions (e.g., query mechanisms, transaction management, buffer management, access methods)
Week 10	Design of core DBMS functions (e.g., query mechanisms, transaction management, buffer management, access methods)
Week 11	Use of a declarative query language
Week 12	Use of a declarative query language
Week 13	Systems supporting structured and/or stream content
Week 14	Systems supporting structured and/or stream content
Week 15	Systems supporting structured and/or stream content
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Introduction to database systems
Week 2	Components of database
Week 3	Database architecture
Week 4	Design of core DBMS functions (e.g., query mechanisms, transaction management, buffer)
Week 5	Design of core DBMS functions (e.g., query mechanisms, transaction management, buffer

	management, access methods)
Week 6	Use of a declarative query language
Week 7	Systems supporting structured and/or stream content

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	• Database system concept, 5\E, Abraham silberschatz and Merry F. Koth, 2006 • Database Systems: The Complete Book • Book by Héctor García-Molina, Jeffrey Ullman, and Jennifer Widom	Yes
Recommended Texts	• Fundamentals of Database Systems Book by Ramez Elmasri	No
Websites	• **المواقع العلمية الرصينة**	

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

Note: Marks 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.

Module Information
معلومات المادة الدراسية

Module Title	**Computer Graphics**			**Module Delivery**	
Module Type	**C**			☒ **Theory**	
Module Code	**CS313**			☒ **Lecture**	
ECTS Credits	**8**			☒ **Lab**	
SWL (hr/sem)	**200**			☐ **Tutorial**	
				☐ **Practical**	
				☐ **Seminar**	
Module Level	3		**Semester of Delivery**	5	
Administering Department	CS		**College**	CSI	
Module Leader	Qysay Omran		**e-mail**	E-mail	
Module Leader's Acad. Title	Assist. Professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Ali Obeed		**e-mail**	E-mail	
Scientific Committee Approval Date	01/06/2023		**Version Number**	1.0	

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	CSI111	**Semester**	1
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. Obtaining knowledge and facts related to the types of computer graphics programs and technologies. 2. Students acquire practical skills to use computer drawing software. 3. Learn about the reasons why drawing is used. 4. Know the drawing methods used to build a two-dimensional and three-dimensional drawing
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Obtaining knowledge and facts related to the types of computer graphics programs and technologies. 2. Students acquire practical skills to use computer drawing software. 3. Learn about the reasons why drawing is used. 4. Know the drawing methods used to build a two-dimensional and three-dimensional drawing.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Introduction to computer graphics: - What is acompter graphics? -Elements of pictures. -Graphics display devices. -Graphics inputprimitives and devices. Getting stated drawing figures: -Getting started making pictures. -Drawing based graphics primitives. -Making lines drawings. -Simple interaction with the mouse and keyboard. More drawing tools: -World windows and viewports. -Clipping lines. -Figures based on regular polygon. -Drawing circles and arcs Introduction to transformation. -Transforming point and objects, the affine

	transformation, -3D affine transformation. -Changing coordinate systems. -Drawing 3D scenes with openGL. Fundamentals Three Dimensional viewing: -The camera revised. -Building a camera in a program. -Perspective projections of 3D objects.

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.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	136	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	9
Total SWL (h/sem)	200		

الحمل الدراسي الكلي للطالب خلال الفصل	

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	5% (5)	5, 10	LO #1, 2, 10 and 11
	Assignments	1	5% (5)	3,5 and 8	LO # 3, 4, 6 and 7
	Projects / Lab.	15	20% (20)	Continuous	All
	Report	1	5% (5)	Continuous	All
Summative assessment	Midterm Exam	2hr	15% (15)	12	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction - Introduction to computer graphics
Week 2	Elements of pictures. -Graphics display devices. -Graphics input primitives and devices
Week 3	Getting stated drawing figures
Week 4	Getting started making pictures. -Drawing based graphics primitives
Week 5	Making lines drawings. -Simple interaction with the mouse and keyboard
Week 6	More drawing tools: -World windows and viewports.
Week 7	More drawing tools: - Clipping Circuit

Week 8	More drawing tools: - Figures based on regular polygon. -Drawing circles and arcs
Week 9	Introduction to transformation. -Transforming point and objects
Week 10	the affine transformation, -3D affine transformation
Week 11	Changing coordinate systems. -Drawing 3D scenes with openGL
Week 12	Three Dimensional viewing: -The camera revised
Week 13	Building a camera in a program. -Perspective projections of 3D objects
Week 14	Building a camera in a program. -Perspective projections of 3D objects
Week 15	Building a camera in a program. -Perspective projections of 3D objects
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Getting stated drawing figures
Week 2	Continues
Week 3	Lab 2: Getting started making pictures. -Drawing based graphics primitives
Week 4	Continues
Week 5	Lab 3: More drawing tools: - Figures based on regular polygon. -Drawing circles and arcs
Week 6	Continues
Week 7	Lab 4: Changing coordinate systems. -Drawing 3D scenes with openGL
Week 8	Continues
Week 9	Lab 5: 3D affine transformation
Week 10	Continues
Week 11	Lab 6: Transforming point and objects

Week 12	Continues
Week 13	Lab 7: Perspective projections of 3D objects
Week 14	Continues
Week 15	**Preparatory week before the final Exam**

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	**Available in the Library?**
Required Texts	• rank Klawonn (2020). Introduction to Computer Graphics: Using Java 2D and 3D. Second Edition. Springer-Verlag London.	Yes
Recommended Texts		No
Websites		

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

Note: Marks 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.

Module Information

معلومات المادة الدراسية

Module Title	**Websites Programming**		**Module Delivery**	
Module Type	**C**		☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	CS314			
ECTS Credits	**6**			
SWL (hr/sem)	**150**			
Module Level	**3**	**Semester of Delivery**	**5**	
Administering Department	**CS**	**College**	**CSI**	
Module Leader	**Salwa Shakir**	**e-mail**		
Module Leader's Acad. Title	**Lecturer**	**Module Leader's Qualification**	**M.S.C**	
Module Tutor		**e-mail**		
Peer Reviewer Name	**Ali Hakim**	**e-mail**		
Scientific Committee Approval Date	**01/06/2023**	**Version Number**	**1.0**	

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	**CSI111**	**Semester**	**1**
Co-requisites module	**None**	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	• This course aims to provide the student with an overview of programming websites. • Enables the student to design advanced web pages through an integrated set of programming languages. • The student can program web pages through a set of programming languages. • The student can design web pages that deal with relational databases stored on the Internet. • Enable the student to build effective databases for web applications and update them via the Internet. • Enables the student to deal with the Client-Server environment
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	• Enable the student to know the types and basics of designing and programming websites via the Internet and the Web. • •Enable the student to know the languages needed to design and program various types of websites on the Internet. • •Enable the student to know the basic functions provided by the various design and programming languages for the Web. • •Enable the student to build websites that work effectively on the Internet. • •Providing students with programming skills for programming websites on the Internet. • •Providing students with skills in updating programs, discovering and identifying software errors, and how to deal with them. • •Providing the student with the logical analysis skill of structuring databases related to websites
Indicative Contents المحتويات الإرشادية	

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Type something like: 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 types of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	**64**	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	**4**
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	**86**	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	**9**
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	5% (5)	5 and 10	LO #1, #2 and #10, #11
	Assignments	1	5% (5)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	15	20% (20)	Continuous	All
	Report	1	5% (5)	13	LO #5, #8 and #10
Summative assessment	**Midterm Exam**	2hr	15% (15)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	**HTML Language/Design Language**
Week 2	**HTML Language**
Week 3	**HTML Language**
Week 4	**HTML Language**
Week 5	**HTML Language**
Week 6	**HTML Language**
Week 7	**HTML Language**
Week 8	**CSS Language/ Format Language**
Week 9	**CSS Language**
Week 10	**CSS Language**
Week 11	**Java Script/ Programming Language**
Week 12	**Java Script**
Week 13	**Java Script**
Week 14	**Java Script**
Week 15	**Java Script**
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	**Lab 1: HTML Language/ Design Language**
Week 2	**Lab2: HTML Language**
Week 3	**Lab 3: CSS Language/ Format Language**
Week 4	**Lab 4: CSS Language**
Week 5	**Lab5: Java Script/ Programming Language**
Week 6	**Lab 6: Java Script**
Week 7	**Lab 7: Java Script**

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	• **Puntambekar, A.A., 2020. Internet Programming. Technical Publications.** • **Grove, R.F., 2009. Web Based Application Development. Jones & Bartlett Publishers.**	Yes
Recommended Texts		No
Websites	• **scientific sites**	

Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
Success Group	**A -** Excellent	امتياز	90 - 100	Outstanding Performance

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

Note: Marks 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.

Module Information
معلومات المادة الدراسية

Module Title	**Information Retrieval and Web Search**			**Module Delivery**	
Module Type	**C**			☒ **Theory**	
Module Code	**CS315**			☒ **Lecture**	
ECTS Credits	**4**			☐ **Lab**	
SWL (hr/sem)	**100**			☐ **Tutorial**	
				☐ **Practical**	
				☐ **Seminar**	
Module Level	3		**Semester of Delivery**	5	
Administering Department	CS		**College**	CSI	
Module Leader	Nisreen Riyadh		**e-mail**	E-mail	
Module Leader's Acad. Title	Lecturer		**Module Leader's Qualification**	Master	
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Salwa Shakir		**e-mail**	E-mail	
Scientific Committee Approval Date	01/06/2023		**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	CSI121	**Semester**	2
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 present the basic concepts in information retrieval and more advanced techniques of multimodal based information systems. 2. To develop skills of using recent Information Retrieval software for solving practical problems. 3. To understand the underlined problems related to information retrieval and acquired the necessary experience. 4. To gain experience of doing independent study and research. 5. To design, and implement real applications using Information Retrieval. 6. Demonstrate genesis and diversity of information retrieval situations for text and hyper media. 7. Describe hands-on experience store, and retrieve information from www using semantic approaches. 8. Demonstrate the usage of different data/file structures in building computational search engines.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	4. Introducing students to the basics of web search and information retrieval. 5. Provide the student with the necessary knowledge to design a simple information retrieval system. 6. Learn some information retrieval algorithms. 7. Skills objectives of the course: 8. Providing the student with the skill of designing research programs and information retrieval. 9. Providing the student with the skill of teamwork to complete scientific research projects.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Introduction Definition of Information Retrieval (IR) and Web Search, IR Terminologies (Document, QUERY, Collection or Databases vs. IR, Corpora), Dimensions of IR, Tasks of IR and Big issues in IR. And giving an Overview of text retrieval systems [15 hrs]

	Retrieval models and implementation: Vector Space Models: Vector Space Model, TF-IDF Weight, and evaluation in information retrieval. [15 hrs] Query expansion and feedback: Relevance feedback, pseudo-relevance feedback, and Query Reformulation. [10 hrs] Probabilistic models; statistical language models: Okapi/BM25; Language models, KL-divergence, and Smoothing. [15 hrs] Text classification & Text clustering The text classification problem, Naive Bayes text classification, k- nearest neighbors, Support vector Machine. [15 hrs] Feature Selection, Vector-space clustering; K-means algorithm, Hierarchical clustering, DBSCAN algorithm, PAM and PAMK• EM algorithm. [15 hrs] Web search basics, crawling, indexes, Link analysis: Web Characteristics, Crawling, Web As a graph, Page Rank, and Hubs and Authorities plex Frequency, s-Plane, Poles and Zeros, Response Function, and Bode Plots. [15 hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The major strategy for presenting this module will be to encourage students to participate in the tasks while also polishing and improving their critical thinking skills. This will be accomplished through classes, interactive tutorials, and the consideration of various types of simple experiments involving activities such as assigning the

	student to prepare a simple retrieval system, preparing brief reports on various topics, or preparing projects for specific retrieval systems, or making optional lectures on information retrieval-related topics. and assessed on a daily, mid-term, and final exam.

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	32	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	68	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

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, 10 and 11
	Assignments	1	5% (5)	2, 12	LO # 3, 4, 6 and 7
	Projects				
	Report	1	5% (5)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	30% (30)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	**Introduction** Definition of Information Retrieval (IR) and Web Search. IR Terminologies (Document, QUERY, Collection or Databases vs. IR, Corpora) Dimensions of IR, Tasks of IR Big issues in IR.
Week 2	**Overview of text retrieval systems** □ Boolean retrieval □ The term vocabulary and postings lists □ Dictionaries and tolerant retrieval □ Index construction and compression
Week 3	**Retrieval models and implementation: Vector Space Models** □ Vector Space Model □ TF-IDF Weight □ Evaluation in information retrieval
Week 4	**Query expansion and feedback** □ Relevance feedback □ pseudo relevance feedback □ Query Reformulation
Week 5	**Probabilistic models; statistical language models**

	□ Okapi/BM25; □ Language models
Week 6	**Probabilistic models; statistical language models** □ KL-divergence □ Smoothing
Week 7	**Text classification & Text clustering** □ The text classification problem □ Naive Bayes text classification
Week 8	**Text classification & Text clustering** □ k- nearest neighbors □ Support vector Machine
Week 9	**Text classification & Text clustering** □ Feature Selection □ Vector-space clustering;
Week 10	**Text classification & Text clustering** □ K-means algorithm □ Hierarchical clustering
Week 11	**Text classification & Text clustering** □ DBSCAN algorithm □ PAM and PAMK □ EM algorithm
Week 12	**Web search basics, crawling, indexes, Link analysis** □ Web Characteristic

	□ Crawling □ Web As a graph
Week 13	**Web search basics, crawling, indexes, Link analysis** □ Page Rank □ Hubs and Authorities plex Frequency, s-Plane, Poles and Zeros, Response Function, Bode Plots
Week 14	**IR applications** □ Information extraction □ Question answering
Week 15	**IR applications** □ Opinion summarization □ Social Network

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Introduction to Information Retrieval, by Manning, Raghavan, Schütze, Cambridge University Press 2008	Yes
Recommended Texts	Search Engines Information Retrieval in Practice by W. Bruce Croft, Donald Metzler, and Trevor Strohman, Pearson Education, Inc 2015.	yes
Websites	https://nlp.stanford.edu/IR-book/	

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

Note: Marks 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.

Application Development and Programming

معلومات المادة الدراسية

Module Title	**Encryption**	**Module Delivery**	
Module Type	**C**	☒ **Theory** ☒ **Lecture** ☐ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**CS321**		
ECTS Credits	**4**		
SWL (hr/sem)	**100**		
Module Level	3	**Semester of Delivery**	6
Administering Department	CS	**College**	CSI
Module Leader	Rana Juma	**e-mail**	
Module Leader's Acad. Title	Assist. Prof.	**Module Leader's Qualification**	Ph.D.

Module Tutor		**e-mail**	
Peer Reviewer Name	Salwa Shakir	**e-mail**	
Scientific Committee Approval Date	20/06/2023	**Version Number**	1.0

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	CSI121	**Semester**	2
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	• An introduction to the student in the concept bases of cryptographic algorithms. • Develop student skills in encryption algorithms. • Giving the student an overview of encryption and its types. • The course aims to introduce students to the mechanism of encryption algorithms.
Module Learning Outcomes مخرجات التعلم للمادة	• Study encryption algorithms well. • Know the properties of these algorithms. • Learn some encryption algorithms.

الدراسية	
Indicative Contents المحتويات الإرشادية	• An introduction to the student in the concept bases of cryptographic algorithms. • Develop student skills in encryption algorithms. • Giving the student an overview of encryption and its types. • The course aims to introduce students to the mechanism of encryption algorithms.

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.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	32	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem)	68	**Unstructured SWL (h/w)**	4

الحمل الدراسي غير المنتظم للطالب خلال الفصل		الحمل الدراسي غير المنتظم للطالب أسبوعيا	
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

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, 10 and 11
	Assignments	1	5% (5)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.				
	Report	1	5% (5)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	30% (30)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	introduction
Week 2	Classical encryption techniques
Week 3	Classical encryption techniques
Week 4	Products techniques
Week 5	Block cipher

Week 6	Data encryption standard
Week 7	Group, ring , field Modular operation
Week 8	Advanced Encryption standard
Week 9	Block cipher and stream cipher characteristics
Week 10	introduction
Week 11	Classical encryption techniques
Week 12	Classical encryption techniques
Week 13	Products techniques
Week 14	Block cipher
Week 15	Block cipher
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	**Available in the Library?**
Required Texts	Handbook of Applied Cryptography, 1996 Edition	Yes
Recommended Texts	Modern Cryptography for Beginners, A Complete Guide to Discover History, Features, Developments and Applications of Modern Cryptography, Simon Edwards, 2020	Yes
Websites		

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

Note: Marks 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.

Application Development and Programming

معلومات المادة الدراسية

Module Title	**Compilers**	**Module Delivery**	
Module Type	**C**	☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**CS322**		
ECTS Credits	**6**		
SWL (hr/sem)	**150**		
Module Level	3	**Semester of Delivery**	6
Administering Department	CS	**College**	CSI
Module Leader	Nisreen Riyadh	**e-mail**	Qusay.amran@qu.edi.iq
Module Leader's Acad. Title	Lecturer	**Module Leader's Qualification**	Master
Module Tutor		**e-mail**	
Peer Reviewer Name	Saad Hussein	**e-mail**	
Scientific Committee Approval Date	20/06/2023	**Version Number**	1.0

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	CSI121	**Semester**	2
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 teach concepts of language translation and phases of compiler design 2. To describe the common forms of parsers 3. To inculcate knowledge of parser by parsing LL parser and LR parser 4. To demonstrate intermediate code using technique of syntax directed translation 5. To Illustrate the various optimization techniques for designing various optimizing compilers
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	At the end of the course students will be able to: 1. Use compiler construction tools and describes the Functionality of each stage of compilation process 2. Construct Grammars for Natural Languages and find the Syntactical Errors/Semantic errors during the compilations using parsing techniques 3. Analyze different representations of intermediate code. 4. Construct new compiler for new languages. 5. Participate in GATE, PGECET and other competitive examinations
Indicative Contents المحتويات الإرشادية	Units and Unit Content **1. Unit 1,** teaching hours: 3 hrs 1.1 Compiler Structure: Analysis and Synthesis Model of Compilation, different sub-phases within analysis and synthesis phases. 1.2 Basic concepts related to Compiler such as interpreter, simple One-Pass Compiler, preprocessor, macros, symbol table and error handler. **2. Unit 2,**teaching hours: 22 hrs 2.1 Lexical Analysis: Its role, Specification and Recognition of tokens, Input Buffer, Finite Automata relevant to compiler construction syntactic specification of

languages, Optimization of DFA based pattern matchers

2.2 Syntax Analysis: Its role, Basic parsing techniques: Problem of Left Recursion, Left Factoring, Ambiguous Grammar, Top-down parsing, Bottom-up parsing, LR parsing

2.3 Semantic Analysis: Static & Dynamic Checks, Typical Semantic errors, Scoping, Type Checking; Syntax directed definitions (SDD) & Translation (SDT), Attribute Types: Synthesized & Inherited, Annotated Parse Tree, S-attributed and L-attributed grammar, Applications of syntax directed translation, Type Systems, Type Checking and Conversion

3. Unit 3,teaching hours: 4 hrs

3.1 Symbol Table Design: Function of Symbol Table, Information provided by Symbol Table, Attributes and Data Structures for symbol table

3.2 Run–time storage management

4. Unit 4,teaching hours: 16 hrs

4.1 Intermediate Code Generator: High-level and Low-level Intermediate representation, Syntax tree & DAG representations, Three-address code, Quadruples, Triples, SDT for intermediate code, Intermediate code generation for Declarations, Assignments, Control Flow, Boolean Expressions and Procedure Calls; Back patching

4.2 Code Generator: Factors affecting a code generator, Target Language, Basic blocks and flow graphs, Dynamic programming code-generation algorithm

4.3 Code Optimization: Need and criteria of Code Optimization, Basic optimization techniques

4.4 Case Studies of some compilers like C compiler, C++ complier, Visual Studio.

Laboratory Works:

The laboratory work develops practical knowledge on different concepts of compiler design.

Students should

Create a project by using lexical analyzer generator or any high level language

	Create a parser by using parser generator or any high level language Write programs for intermediate code generation and machine code generation Create front end of a compiler and using general purpose programming languages

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.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	86	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
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	5% (5)	5, 10	LO #1, 2, 10 and 11
	Assignments	1	5% (5)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	15	20% (20)	Continuous	All
	Report	1	5% (5)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	2hr	15% (15)	7	LO # 1-7
	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 Compilers: The role of language translation in the programming process; Comparison of interpreters and compilers, language translation phases, machine-dependent and machine-independent aspects of translation, language translation as a software engineering activity
Week 2	Lexical Analysis: Application of regular expressions in lexical scanners,
Week 3	Lexical Analysis: hand coded scanner vs. automatically generated scanners
Week 4	Lexical Analysis: formal definition of tokens, implementation of finite state automata.
Week 5	Syntax Analysis: Revision of formal definition of grammars, BNF and EBNF; bottom-up vs. top-down parsing,
Week 6	Syntax Analysis: tabular vs. recursive-descent parsers, error handling
Week 7	Parsers Implementation: automatic generation of tabular parsers, symbol table management, the

	use of tools in support of the translation process.
Week 8	Semantic Analysis: Data type as set of values with set of operations, data types, type- checking models, semantic models of user-defined types, parametric polymorphism, subtype polymorphism, type-checking algorithms.
Week 9	Intermediate Representation, code generation: Intermediate and object code, intermediate representations, implementation of code generators
Week 10	Code generation: code generation by tree walking; context sensitive translation, register use.
Week 11	Code optimization: Machine-independent optimization; data-flow analysis; loop optimizations; machine-dependent optimization
Week 12	Error Detection and Recovery
Week 13	Error Repair, Compiler Implementation
Week 14	Compiler design options and examples: C Compilers, C++ compiler, Visual Studio.
Week 15	C++, Java, , Visual Studio, and YACC Compilers Project presentation
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Write a LEX Program to Scan and Count the number of characters, words, and lines in a file
Week 2	Lab 2: Write a C Program to implement NFAs that recognize identifiers, constants, and operators of the mini language
Week 3	Lab 3: Write a C Program to implement DFAs that recognize identifiers, constants, and operators of the mini language
Week 4	Lab 4: Design a lexical analyzer for the given language. The lexical analyzer should ignore redundant spaces, tabs and new lines, comments etc.

Week 5	Lab 5: Implement the lexical analyzer using JLex, flex or other lexical analyzer generating tools.
Week 6	Lab 6: Design Predictive Parser for the given language
Week 7	Lab 7: Design a LALR bottom up parser for the given language
Week 8	Lab 8: Convert the BNF rules into Yacc form and write code to generate abstract syntax tree.
Week 9	Lab 9: A program to generate machine code from the Abstract syntax tree generated by the parser.
Week 10	Lab 10: UML Diagram for ATM Transaction System
Week 11	Lab 11: UML Diagram for Library Management System
Week 12	Lab 12: UML Diagram for College Administration System
Week 13	Lab 13: Write a Lex Program to convert abc to ABC
Week 14	Lab 14: Write a lex program to find out total number of vowels, and consonants from the giv1en input sting.
Week 15	Lab 15: Write a first and follow Program
Week 16	Lab 16: Final project

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Compiler Design - Second Edition ,By Yesdee Publishing Author : Dr. S. Godfrey Winster,S. Aruna Devi,R. Sujatha ISBN : 9789391549022.	Yes
Recommended Texts	The Compiler Design Handbook,Optimizations and Machine Code Generation, Second Edition Contributor(s):Rajib Mall, Y.N. Srikant, Priti Shankar. https://doi.org/10.1201/9781315219967	Yes
Websites	https://www.taylorfrancis.com/ , https://www.coursera.org/	

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

Note: Marks 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.

Module Information معلومات المادة الدراسية				
Module Title	**Artificial Intelligence**			**Module Delivery**
Module Type	C			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**
Module Code	CS323			
ECTS Credits	6			
SWL (hr/sem)	150			
Module Level	3	**Semester of Delivery**	6	
Administering Department	CS	**College**	CSI	
Module Leader	Ali Obied Sharrad	**e-mail**	E-mail	

Module Leader's Acad. Title	Professor	**Module Leader's Qualification**	Ph.D.
Module Tutor	Name (if available)	**e-mail**	E-mail
Peer Reviewer Name	Qusay O. Mosa	**e-mail**	Qusay.mosa@qu.edu.iq
Scientific Committee Approval Date	20/06/2023	**Version Number**	1.0

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	CSI121	**Semester**	2
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	• Provide students with in-depth knowledge on intelligent programs and expert systems. • introduce and practice how to develop expert system and what is the deference between expert system and intelligent programs • Provide student with in-depth knowledge on intelligent applications.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	a. Upon completion of the subject, students will be able to: • Demonstrate knowledge and understanding of the motivation for designing intelligent machines, their implications and associated philosophical issues, such as the nature of intelligence and learning. • Demonstrate systematic understanding, critical awareness and application of the main kinds of state-space search algorithms, considering their strengths and limitations. • Understand and explain the main concepts and principles associated with different kinds of knowledge representation, such as logic, case-based representations, and subsymbolic/connectionist representations. • Demonstrate mastery of the main concepts and principles of major kinds of biologically-inspired algorithms, and understand the implementation and evaluation of one such technique. • Demonstrate comprehensive understanding of how various intelligent-system techniques have been used in the context of several case studies, and critically compare different techniques in the context of those case studies.

	• Students are able to demonstrate the applications of artificial intelligence in Image Processing, Optimization Technology, and Game Technology
Indicative Contents المحتويات الإرشادية	**1-** Overview: foundations, scope, problems, and approaches of AI. [4hrs] **2-** Intelligent agents: reactive, deliberative, goal-driven, utility-driven, and learning agents, Artificial Intelligence programming techniques [10 hrs] **3-** Problem-solving through Search: forward and backward, state-space, blind, heuristic, problem-reduction, A, A*, AO*, minimax, constraint propagation, neural, stochastic, and evolutionary search algorithms, sample applications. [6 hrs] **4-** Knowledge Representation and Reasoning: ontologies, foundations of knowledge representation and reasoning, representing and reasoning about objects, relations, events, actions, time, and space; predicate logic, situation calculus, description logics, reasoning with defaults, reasoning about knowledge, sample applications. [8 hrs] **5-** Planning: planning as search, partial order planning, construction and use of planning graphs [8 hrs] **6-** Representing and Reasoning with Uncertain Knowledge: probability, connection to logic, independence, Bayes rule, bayesian networks, probabilistic inference, sample applications. [8 hrs] **7-** Decision-Making: basics of utility theory, decision theory, sequential decision problems, elementary game theory, sample applications. [12 hrs] **8.** Decision under uncertainty, MDP, POMDP,HMD [8 hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Lectures provide students the main concepts of the topic, together with comprehensive examples for easy understanding. 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..

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem)	64	**Structured SWL (h/w)**	4

الحمل الدراسي المنتظم للطالب خلال الفصل		الحمل الدراسي المنتظم للطالب أسبوعيا	
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	86	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
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	5% (5)	5, 10	LO #1, 2, 10 and 11
	Assignments	1	5% (5)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	15	20% (20)	Continuous	All
	Report	1	5% (5)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	2hr	15% (15)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered

Week 1	Overview: foundations, scope, problems, and approaches of AI
Week 2	Intelligent agents: reactive, deliberative, goal-driven, utility-driven
Week 3	Intelligent agents: learning agents, Artificial Intelligence programming techniques
Week 4	Problem-solving through Search: forward and backward, state-space
Week 5	Problem-solving through Search: blind, heuristic, problem-reduction, A, A*, AO*, minimax, constraint propagation
Week 6	Problem-solving through Search: neural, stochastic, and evolutionary search algorithms, sample applications.
Week 7	Mid-term Exam + Unit-Step Forcing, Forced Response, the RLC Circuit
Week 8	Predicate logic, situation calculus, description logics
Week 9	Reasoning with defaults, reasoning about knowledge, sample applications.
Week 10	Planning: planning as search, partial order planning,
Week 11	Planning: construction and use of planning graphs
Week 12	Representing and Reasoning with Uncertain Knowledge: probability, connection to logic, independence, Bayes rule, bayesian networks, probabilistic inference, and sample applications.
Week 13	Decision-Making: basics of utility theory, decision theory, sequential decision problems, elementary game theory, sample applications.
Week 14	Decision-Making: sequential decision problems, elementary game theory, sample applications.
Week 15	Decision under uncertainty, MDP, POMDP,HMD
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered

Week 1	Overview: foundations, scope, problems, and approaches of AI
Week 2	Intelligent agents: reactive, deliberative, goal-driven, utility-driven
Week 3	Intelligent agents: learning agents, Artificial Intelligence programming techniques
Week 4	Problem-solving through Search: forward and backward, state-space
Week 5	Problem-solving through Search: blind, heuristic, problem-reduction, A, A*, AO*, minimax, constraint propagation
Week 6	Problem-solving through Search: neural, stochastic, and evolutionary search algorithms, sample applications.
Week 7	Mid-term Exam + Unit-Step Forcing, Forced Response, the RLC Circuit
Week 8	Predicate logic, situation calculus, description logics
Week 9	Reasoning with defaults, reasoning about knowledge, sample applications.
Week 10	Planning: planning as search, partial order planning,
Week 11	Planning: construction and use of planning graphs
Week 12	Representing and Reasoning with Uncertain Knowledge: probability, connection to logic, independence, Bayes rule, bayesian networks, probabilistic inference, and sample applications.
Week 13	Decision-Making: basics of utility theory, decision theory, sequential decision problems, elementary game theory, sample applications.
Week 14	Decision-Making: sequential decision problems, elementary game theory, sample applications.
Week 15	Decision under uncertainty, MDP, POMDP,HMD
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the

		Library?
Required Texts	S.J. Russell & P. Norvig, "Artificial Intelligence: a modern approach", 4th Edition. Pearson, 2020. (main textbook)	Yes
Recommended Texts	1. Amit Konar, "Artificial Intelligence and Soft Computing, Behavior and Cognitive Modeling of the Human Brain", CRC Press, 2000 2. George F. Luger, "Artificial Intelligence Structures and Strategies for Complex Problem Solving", Pearson Eduction Asia (Singapore), 6/E, 2009	yes
Websites	https://www.tutorialspoint.com/artificial_intelligence/index.htm	

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

Note: Marks 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.

Module Information معلومات المادة الدراسية					
Module Title	Distributed databases			**Module Delivery**	
Module Type	C			☒ **Theory** ☒ **Lecture** ☐ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	CS324				
ECTS Credits	4				
SWL (hr/sem)	100				
Module Level	3		**Semester of Delivery**	6	
Administering Department	CS		**College**	CSI	
Module Leader	Lamia Abid Noor		**e-mail**		
Module Leader's Acad. Title	Professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Luma Salal		**e-mail**		
Scientific Committee Approval Date	01/06/2023		**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	CSI121	**Semester**	2
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	• Understanding database principles and design methods. • Understand what database management systems are. • Know the reasons that led to the emergence of distributed databases. • Know what architectures are available and used to build distributed database systems.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	A- Cognitive goals: 1. Introducing the principles and basics of distributed databases, systems and types. 2. Apply the concepts of distributed databases. 3. Realizing the importance of distributed database systems. 4. Determine the difference between database systems and distributed database systems. 5. The ability to describe distributed database systems. B- Course objectives: 1. The ability to deliver lectures related to distributed database systems. 2. The ability to design a distributed database system. 3. The ability to learn and train on various traditional and distributed database systems. 4. The ability to manage dialogues and discussions related to database systems and distributed databases.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. -Introduction to DB, The function of DBMS, DBA's responsibilities, DB facilities, DB limitations, Advantage of DB -Architecture of DB -Overview of DDB. - DDB integrity -Distributed Database Design - Concurrency control - Database recovery

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.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ أسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	32	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	68	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

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, 10 and 11
	Assignments	1	5% (5)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.				
	Report	1	5% (5)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	30% (30)	7	LO # 1-7
	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 DB, The function of DBMS, DBA's responsibilities, DB facilities, DB limitations, Advantage of DB.
Week 2	Introduction to DB, The function of DBMS, DBA's responsibilities, DB facilities, DB limitations, Advantage of DB.
Week 3	Introduction to DB, The function of DBMS, DBA's responsibilities, DB facilities, DB limitations, Advantage of DB.
Week 4	Artecheture of DB
Week 5	Artecheture of DB
Week 6	Overview of DDB.
Week 7	Overview of DDB.
Week 8	DDB integrity
Week 9	DDB integrity
Week 10	Distribuited Database Design

Week 11	Distribuited Database Design
Week 12	Distribuited Database Design
Week 13	Concurency control
Week 14	Database recovery
Week 15	Database recovery
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	**Available in the Library?**
Required Texts	Database system concept, 5\E, Abraham silberschatz and Merry F. Koth, 2006	Yes
Recommended Texts	Stefano Geri and Giuseppe Pelagatti (1984), Distributed Data Bases Principles and Systems, Mc-Graw Hill.	No
Websites	Distributed database, stelane ceri, 2002.	

Grading Scheme

مخطط الدرجات

Group	**Grade**	التقدير	**Marks (%)**	**Definition**
Success Group	**A -** Excellent	امتياز	90 - 100	Outstanding Performance

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

Note: Marks 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.

Module Information
معلومات المادة الدراسية

Module Title	Python Programming			**Module Delivery**	
Module Type	**C**			☒ **Theory**	
Module Code	CS325			☒ **Lecture**	
ECTS Credits	**6**			☒ **Lab**	
SWL (hr/sem)	**150**			☐ **Tutorial**	
				☐ **Practical**	
				☐ **Seminar**	
Module Level	3		**Semester of Delivery**	**6**	
Administering Department	**CS**		**College**	**CSI**	
Module Leader	**Nisreen Riyadh**		**e-mail**		
Module Leader's Acad. Title	**Lecturer**		**Module Leader's Qualification**	**M.S.c**	
Module Tutor			**e-mail**		
Peer Reviewer Name	**Mustafa Yahya**		**e-mail**		

Scientific Committee Approval Date	**01/06/2023**	**Version Number**	**1.0**

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	**CSI121**	**Semester**	**2**
Co-requisites module	**None**	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives **أهداف المادة الدراسية**	**1 .The course aims to introduce students to the Python language.** **2. Developing the student's abilities in the field of programming and the use of modern languages.** **3. Provide the student with new concepts in the field of programming.**
Module Learning Outcomes **مخرجات التعلم للمادة الدراسية**	**1. Teaching students new concepts in programming.** **2.Providing the student with the necessary knowledge to deal with various software problems that he may encounter in his daily life.** **3 .Enhancing the student's ability to write highly efficient programs.** **4. Providing the student with new skills in writing programs5 .. Increasing 5. student skills in designing programs that meet user needs.** **6 .Developing the student's ability to keep up with the scientific development in the field of information technology**
Indicative Contents **المحتويات الإرشادية**	**1 .The course aims to introduce students to the Python language.** **2. Developing the student's abilities in the field of programming and the use of modern languages.** **3. Provide the student with new concepts in the field of programming.**

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	**Type something like: 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 types of simple experiments involving some sampling activities that are interesting to the students.**

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	**64**	**Structured SWL (h/w)** **الحمل الدراسي المنتظم للطالب أسبوعيا**	**4**
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	**86**	**Unstructured SWL (h/w)** **الحمل الدراسي غير المنتظم للطالب أسبوعيا**	**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	5% (5)	5 and 10	LO #1, #2 and #10, #11
	Assignments	1	5% (5)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	15	20% (20)	Continuous	All
	Report	1	5% (5)	13	LO #5, #8 and #10

Summative assessment	**Midterm Exam**	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	**Introduction to the Python language**
Week 2	**General concepts in the Python language**
Week 3	**General concepts in the Python language**
Week 4	**Arrays and Lists in Python**
Week 5	**Arrays and Lists in Python**
Week 6	**Arrays and Lists in Python**
Week 7	**Functions in the Python language**
Week 8	**Functions in the Python language**
Week 9	**Control sentences: choice sentences**
Week 10	**Control sentences: choice sentences**
Week 11	**Control sentences: Repetition sentences**
Week 12	**Control sentences: Repetition sentences**
Week 13	**classes and objects**
Week 14	**classes and objects**
Week 15	**classes and objects**
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	**Lab 1: Arrays and Lists in Python**
Week 2	**Lab 2: Arrays and Lists in Python**
Week 3	**Lab 3: Functions in the Python language**
Week 4	**Lab 4: Functions in the Python language**
Week 5	**Lab 5: Control sentences: choice sentences**
Week 6	**Lab 6: Control sentences: Repetition sentences**
Week 7	**Lab 7: classes and objects**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	• **Learning Python, 5th Edition, 2013.**	Yes
Recommended Texts		No
Websites	• **scientific sites**	

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

Note: Marks 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.

Module Information
معلومات المادة الدراسية

Module Title	**Data Mining**	**Module Delivery**	
Module Type	**C**	☒ **Theory**	
Module Code	**CS326**	☒ **Lecture**	
ECTS Credits	**4**	☐ **Lab**	
SWL (hr/sem)	**100**	☐ **Tutorial**	
		☐ **Practical**	
		☐ **Seminar**	

Module Level	3	**Semester of Delivery**	6
Administering Department	CS	**College**	CSI
Module Leader	Lamia Abid Noor	**e-mail**	
Module Leader's Acad. Title	Professor	**Module Leader's Qualification**	Ph.D.
Module Tutor	Name (if available)	**e-mail**	E-mail
Peer Reviewer Name	Qusay Omran	**e-mail**	
Scientific Committee Approval Date	01/06/2023	**Version Number**	1.0

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	CSI121	**Semester**	1
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	• To develop problem-solving skills and understanding of data mining applications and techniques. • This course deals with the basic concept of data mining techniques and tasks. • To understand techniques used to extract the required information quickly and efficiently. • To understand modern techniques used in the field of data classification and forecasting • To understand basic methods for converting and reducing the volume of data, especially big data.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	• • List the various terms associated with data mining. • The course aims to provide the student with the necessary knowledge to manage, analyze and mine a huge amount of data. • Provide students with some advanced concepts in data mining techniques, especially, data classification, clustering, and regression methods. • Provide students with the necessary skills to deal with a huge amount of data and retrieve the required information. • Provide students with data classification skills. • Provide students with analytical skills.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: 1. Data Mining Functionalities and Process (Report+ presentation) (2 weeks) 2. Architecture of Data Mining Systems (Report+ presentation)

	(2 weeks) 3. Data Preprocessing: dealing with Data Cleaning and Data Integration (Presentation) (2 weeks) 4. Data Transformation and Data Reduction (Presentation) (2 weeks) 5. Data Generalization and Summarization-Based Characterization Mining (Report+ presentation) (2 weeks) 6. Association Rules In Large Databases: Classification and Prediction (Project+ presentation) (2 weeks) 10. Classification By Decision Tree Induction, Bayesian Classification and Prediction (Report) (1 week) 11. Cluster Analysis: Categorization of Major Clustering Methods: Partitioning and Hierarchical Methods (Report+ presentation) (2 weeks)

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 the type of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	32	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	68	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

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, 10 and 11
	Assignments	1	5% (5)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.				
	Report	1	5% (5)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	30% (30)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered

Week 1	Data Mining: Data Mining Functionalities, Data Mining Process
Week 2	Architecture of a Typical Data Mining Systems, Classification of Data Mining Systems
Week 3	Data Mining Techniques, Data Preprocessing, Data Cleaning, Data Integration, Data Transformation and Data Reduction
Week 4	Data Mining Techniques, Data Preprocessing, Data Cleaning, Data Integration, Data Transformation and Data Reduction
Week 5	Data Generalization and Summarization Based Characterization
Week 6	Mining Association Rules In Large Databases, Classification and Prediction
Week 7	Classification By Decision Tree Induction, Bayesian Classification
Week 8	Review
Week 9	Prediction, Clusters Analysis
Week 10	Types of Data in Cluster Analysis
Week 11	Categorization of Major Clustering Methods
Week 12	Partitioning Methods, Hierarchical Methods
Week 13	Applications of Data Mining
Week 14	Social Impacts of Data Mining, Mining WWW
Week 15	Mining Text Database, Mining Spatial Databases
Week 16	**Final Exam**

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	**Available in the Library?**
Required Texts	Han, Jiawei, Jian Pei, and Micheline Kamber. Data mining: concepts and techniques. Elsevier, 2011.	Yes

Recommended Texts	• Ponniah, Paulraj. Data warehousing fundamentals for IT professionals. John Wiley & Sons, 2011. • Kimball, Ralph, and Joe Caserta. The Data WarehouseÂ ETL Toolkit: Practical Techniques for Extracting, Cleaning, Conforming, and Delivering Data. John Wiley & Sons, 2011.	No
Websites	https://www.coursera.org/courses?query=data%20mining	

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

Note: Marks 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.

Module Information

معلومات المادة الدراسية					
Module Title	**Operating Systems**			**Module Delivery**	
Module Type	**C**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**CS411**				
ECTS Credits	**8**				
SWL (hr/sem)	**200**				
Module Level	4		**Semester of Delivery**	7	
Administering Department	CS		**College**	CSI	
Module Leader	Rana Juma		**e-mail**		
Module Leader's Acad. Title	Assist. Professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Ali Saeed		**e-mail**	E-mail	
Scientific Committee Approval Date	01/06/2023		**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	CSI121	**Semester**	2
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	1. Understand the purpose and functions of an operating system: • Learn about the role of an operating system in managing computer hardware and software resources. • Understand how an operating system provides a user interface and facilitates communication between applications and hardware. 2. Study process management: • Understand the concept of a process and its components. • Learn about process scheduling algorithms, process synchronization, and inter-process communication mechanisms.

	3. Explore memory management: • Understand the concept of memory hierarchy and memory organization in a computer system. • Learn about memory allocation techniques, virtual memory, and memory protection mechanisms. 4. Study file systems: • Understand the concept of a file and file system organization. • Learn about file operations, directory structures, and file system implementation techniques. 5. Explore input/output (I/O) management: • Understand the principles of I/O devices and their interaction with the operating system. • Learn about I/O device drivers, buffering, and I/O scheduling algorithms. 6. Study deadlock handling: • Understand the concept of a deadlock and its causes. • Learn about deadlock prevention, avoidance, detection, and recovery strategies. 7. Understand security and protection mechanisms: • Learn about access control mechanisms, authentication, and authorization. • Study different security threats and techniques for protecting the operating system and user data. 8. Explore distributed systems: • Understand the concepts and challenges of distributed systems. • Learn about network protocols, distributed file systems, and synchronization algorithms in distributed environments. 9. Analyze case studies: • Study real-world operating systems like Unix, Linux, Windows, or macOS. • Understand these operating systems' design principles, architectural components, and functionalities.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	• Understand the fundamental concepts and principles of operating systems. • Understand the relationship between hardware and software components in an operating system. • Understand memory management in operating systems: • Describe virtual memory concepts, including paging, segmentation, and demand paging. • Understand the structure of a file system. • Describe the principles of I/O devices and their interaction with the operating system. • Explain I/O device drivers, buffering, and I/O scheduling algorithms. • Understand the security and protection mechanisms in operating systems. • Describe access control mechanisms, including authentication and authorization. • Explain security threats and countermeasures in an operating system.

	• Implement security measures to protect the system and user data. • Understand the architectural components and functionalities of these operating systems. • Compare and evaluate the strengths and weaknesses of different operating systems.
Indicative Contents المحتويات الإرشادية	1. Introduction to Operating Systems: • Purpose and types of operating systems. • Evolution and history of operating systems. 2. Process Management: • Processes, threads, and scheduling. • Process synchronization and communication. 3. Memory Management: • Memory organization and allocation techniques. • Virtual memory and paging. 4. File Systems: • File system structure and operations. • Directory structures and file allocation methods. 5. I/O Management: • I/O devices, drivers, and operations. • I/O buffering and scheduling. 6. Deadlocks: • Deadlock concept, prevention, detection, and recovery. 7. Security and Protection: • User authentication, access control, and security threats. 8. Distributed Systems: • Concepts, challenges, and synchronization in distributed systems. 9. Case Studies: • Analysis of real-world operating systems and their features.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Employing these strategies can create a comprehensive and engaging learning experience in an operating system module, such as lectures, interactive discussions, hands-on lab sessions, case studies, assignments, projects, guest lectures, online resources, assessments, group projects, and continuous support.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ أسبوعا			
Structured SWL (hr/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	**64**	**Structured SWL (hr/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (hr/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	136	**Unstructured SWL (hr/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
Total SWL (hr/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**200**		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	5% (5)	5 and 10	#1, #2 and #10, #11
	Assignments	1	5% (5)	2 and 12	#3, #4 and #6, #7
	Projects / Lab.	15	20% (20)	Continuous	All
	Report	1	5% (5)	13	#5, #8 and #10
Summative assessment	**Midterm Exam**	2hr	15% (15)	7	#1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered

Week 1	Introduction to Operating Systems • Lecture: Purpose and types of operating systems • Discussion: Evolution and history of operating systems
Week 2	Process Management • Lecture: Processes, threads, and scheduling • Lab Session: Implementing process scheduling algorithms
Week 3	Process Synchronization • Lecture: Process synchronization and inter-process communication • Lab Session: Implementing synchronization mechanisms
Week 4	Memory Management • Lecture: Memory Organization and allocation techniques • Lab Session: Simulating memory allocation strategies
Week 5	Virtual Memory • Lecture: Virtual memory concepts and demand paging • Lab Session: Implementing a basic virtual memory system
Week 6	File Systems • Lecture: File system structure and Operations • Lab Session: Implementing file operations and directory structures
Week 7	I/O Management • Lecture: I/O devices, drivers, and operations • Lab Session: Simulating I/O buffering and scheduling algorithms
Week 8	Deadlocks • Lecture: Deadlock concept and necessary conditions • Lab Session: Implementing deadlock detection and recovery algorithms
Week 9	Security and Protection • Lecture: User authentication, access control, and security threats • Discussion: Case studies on security vulnerabilities and countermeasures
Week 10	Distributed Systems • Lecture: Concepts, challenges, and Synchronization in distributed systems

	• Lab Session: Simulating distributed file systems and synchronization algorithms
Week 11	Case Study: Unix • Lecture: Analysis of Unix architecture and features • Group Project: Analyzing Unix file system and process management
Week 12	Case Study: Linux • Lecture: Analysis of Linux architecture and features • Group Project: Comparing Linux and Unix system calls and utilities
Week 13	Case Study: Windows • Lecture: Analysis of Windows architecture and features • Group Project: Exploring Windows Registry and security mechanisms
Week 14	Review and Exam Preparation • Review of key topics and concepts • Exam practice and preparation
Week 15	Project Presentations and Wrap-up • Group project presentations • Discussion and reflection on the course
Week 16	**A preparatory week before the Final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Setting up the development environment for Java programming and familiarizing students with the basic syntax and concepts
Week 2	Creating and managing processes and threads in Java, including process scheduling and thread synchronization.
Week 3	Implementing memory allocation techniques in Java, such as dynamic data structures for managing memory.
Week 4	Creating, reading, and writing files in Java, implementing file operations and directory structures.
Week 5	Implementing I/O operations in Java, including input/output streams, file handling, and

	buffering.
Week 6	Implementing deadlock detection and prevention algorithms in Java, analyzing resource allocation graphs.
Week 7	Implementing user authentication, access control mechanisms, and security measures in Java applications.
Week 8	Implementing distributed communication and synchronization in Java using network protocols and sockets.
Week 9	Implementing virtual memory concepts in Java, including demand paging and page replacement algorithms.
Week 10	Reviewing key lab session topics and concepts, practicing lab-related questions, and preparing for the lab session exam.
Week 11	Lab Session Exam
Week 12	Conduct a lab session exam to assess students' practical understanding of the lab topics covered.
Week 13	Case Study: Unix-like Operating Systems and Java

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Textbook: 1. "Operating System Concepts" by Abraham Silberschatz, Peter B. Galvin, and Greg Gagne, 2020 2. "Modern Operating Systems" by Andrew S. Tanenbaum and Herbert Bos, 2014.	Yes (E-copy)
Recommended Texts	"Operating Systems: Internals and Design Principles" by William Stallings.	Yes (E-copy)
Websites	GeeksforGeeks: https://www.geeksforgeeks.org/	

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

Note: Marks 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.

Module Information
معلومات المادة الدراسية

Module Title	Digital Image Processing	**Module Delivery**	
Module Type	C		☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**
Module Code	CS412		
ECTS Credits	**8**		
SWL (hr/sem)	**200**		

Module Level	4	**Semester of Delivery**	1
Administering Department	CS	**College**	CSI
Module Leader	Ali Mohsin	**e-mail**	
Module Leader's Acad. Title	Assist Professor	**Module Leader's Qualification**	Ph.D.
Module Tutor	Name (if available)	**e-mail**	E-mail
Peer Reviewer Name	Ali Hakim	**e-mail**	

Scientific Committee Approval Date	21/06/2023	**Version Number**	1.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	CSI211	**Semester**	3
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. Learn the basic principles of digital image processing. 2. Knowledge of color systems used in digital images. 3. Knowledge of methods of generating digital images. 4. Learn about the various operations that take place on digital images, such as enlarging digital images, improving digital images, conversions that take place on digital images, as well as knowing ways to improve digital images
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Introducing the student to digital images and the digital image processing system and its basic components. 2. Introducing students to the use of digital images. 3. Providing the student with knowledge of the composition of the image and how to represent it and store it in the calculator. 4. Provide the student with the color systems used in the images and how to convert from color images to grayscale. 5. Introducing the students to ways to enlarge the image. 6. Provide the student with the knowledge of image improvement.

Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Introduction to Image Processing (1 Week) Computer Imaging system (1 Week) Digital Image file Format (1 Week) Digital Image Representation(1 Week) Region Of Interest Image Geometry (1 Week) Color Image Types (1 Week) Basic Retionships between Pixels (1 Week) Image Zooming (2 week) Arithmetic and logic operation (2 week) Image enhancement (2 week) Edge detection (1 week) Image segmentation(1 week)

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 image processing 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.

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	136	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	9
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	200		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	5% (5)	5, 10	LO #1, 2, 10 and 11
	Assignments	1	5% (5)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	15	20% (20)	Continuous	All
	Report	1	5% (5)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2hr	15% (15)	7	LO # 1-7
	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 Image Processing
Week 2	Computer Imaging system
Week 3	Digital Image file Format
Week 4	Digital Image Representation
Week 5	Region Of Interest Image Geometry
Week 6	Color Image Types
Week 7	Basic Retionships between Pixels
Week 8	Image Zooming
Week 9	Image Zooming
Week 10	Arithmetic operation on Image
Week 11	Logic operation on Image
Week 12	Image Enhancement
Week 13	Image Enhancement
Week 14	Image Edge Detection
Week 15	Image Segmentation
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Introduction to Image processing
Week 2	Lab 2: Open image and converted to another types
Week 3	Lab 3: Image zooming method
Week 4	Lab 4: Image zooming method
Week 5	Lab 5: implement the arithmetic operation on image
Week 6	Lab 6: Continues
Week 7	Lab 7: implement the logical operation on image
Week 8	Lab 8: Continues
Week 9	Lab 9: show image histogram
Week 10	Lab 10: Image enhancement
Week 11	Lab 11: Continues
Week 12	Lab 12: Show ROI from the Image
Week 13	Lab 13: Implement edge detection method
Week 14	Lab 14 : Continues
Week 15	Lab 15: Exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	• Rafael C. Gonzalez & Richard E. Wood, "Digital Image Processing", 2/E, Prentice-Hall 2001	Yes

Recommended Texts	• Scott E. Umbangh, "Computer Vision and Image Processing", Prentice-Hall 1998 • Nick Efford, "Digital Image Processing, a Practical Approach Using Java", Pearson Eduction 2000	No
Websites		

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

Note: Marks 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.

Module Information

معلومات المادة الدراسية

Module Title	**Technical and Electronic Learning**	**Module Delivery**
Module Type	**E**	☒ **Theory**

Module Code	**CS413**	☒ **Lecture** ☐ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**
ECTS Credits	**4**	
SWL (hr/sem)	**100**	

Module Level	4	**Semester of Delivery**	7
Administering Department	**CS**	**College**	**CSI**
Module Leader	Mohammed Iqbal	**e-mail**	
Module Leader's Acad. Title	Assist Professor	**Module Leader's Qualification**	Master
Module Tutor	Name (if available)	**e-mail**	E-mail
Peer Reviewer Name	Zainab Fahad	**e-mail**	
Scientific Committee Approval Date	01/06/2023	**Version Number**	1.0

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	**CSI121**	**Semester**	2
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	1-The student knows the concept of e-learning, its characteristics, and its objectives 2- The student knows the nature of e-learning, and explains its advantages, potentials and disadvantages.

	3- The student knows the origins of e-learning, and classifies its types and forms 4-- The student knows the concept of e-learning based computer
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- Explains the advantages and capabilities of the e-learning system on e-learning resources 2- Explains the limitations of the e-learning system based on e-learning resources, and its problems. 3- Explains the objectives of the e-learning system based on electronic learning resources, its functions and uses. 4- Encouraging students to benefit from the course by believing in the importance of the course in the educational process and in the field of specialization in general. 5- Enhancing cooperation among students through the implementation of practical duties. 6- Developing the intellectual and creative energies of students through their implementation of various duties
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A – E-learning</u> E-learning is the application of information technology in the teaching and learning process. Educational technology is the effective use of technological tools in learning. Educational technology is not restricted to high technology .Nonetheless, electronic

	educational technology, also called e-learning, has become an important part of society today. E-learning comprises an extensive use of digitization approaches, components and delivery methods. For example, m-learning emphasizes mobility [15 hrs] Educational technology includes numerous types of media that deliver text, audio, images, animation, and streaming video, and includes technology applications and processes such as audio or video tape, satellite TV, CD-ROM,. [15 hrs] computer-based learning, as well as local intranet/extranet and web-based learning. Information and communication systems, whether free-standing or based on either local networks or the Internet in networked learning, underlie many e-learning processes. [10 hrs] Revision problem classes [6 hrs] <u>Part B – type , model</u> Synchronous means —at the same time,‖ involves interaction of participants with an instructor via the Web in real time. For example – VCRs or Virtual class rooms that are nothing else but real classrooms online. Participants interact with each other and instructors through instant messaging, chat, audio and video conferencing etc and what's more all the sessions can be recorded and played back. Its benefits are: • Ability to log or track learning activities. • Continuous monitoring and correction is possible • Possibilities of global connectivity and collaboration opportunities among learners. • Ability to personalise the training for each learner [15 hrs] . Asynchronous which means —not at the same time,‖ allows the participants to complete the WBT (Webbased training) at their own pace, without live interaction with the instructor. Basically, it is information that is accessible on a self-help basis, 24/7. The advantage is that this kind of e-Learning offers the learners the information they need whenever they need it. It also has interaction amongst participants through message boards, bulletin boards and discussion forums. These include computer based training,(CBTs) modules on CD-Rom's, Web based training accessed through intranet (WBTs) or through well written articles and other write ups. Its advantages are:- • Available ‗just in time' for instant learning and reference. • Flexibility of access from anywhere at anytime. • Ability to simultaneously reach an unlimited number of employees. • Uniformity of content and one time cost of

	production. [7 hrs] model 1) Demand-Driven Model 2) Strategic e-Learning Model 3) E-learning Acceptance model- Technology acceptance model, Unified theory of acceptance and use of technology 4) Instructional design model- Gagne's Nine Events of Instruction model, ADDIE model, Rapid Prototyping model, Community of enquiry model 5) E-learning Life –cycle model 6) Laurillards conversational model. [15 hrs]

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 types of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	32	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	68	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.5

Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**100**

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	10% (10)	5 and 10	LO #1, #2 and #10, #11
	Assignments	1	5% (5)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.				
	Report	1	5% (5)	13	LO #5, #8 and #10
Summative assessment	**Midterm Exam**	2hr	30% (30)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to e-learning
Week 2	concept, characteristics, and objectives
Week 3	nature, advantages, potential and disadvantages
Week 4	origin, types and forms

Week 5	concept and characteristics, areas of use
Week 6	Computer-assisted e-learning patterns
Week 7	Mid exam
Week 8	characteristics, working environment
Week 9	strategies and patterns
Week 10	design and construction standards
Week 11	Application examples
Week 12	work Pro. E-book Maestro
Week 13	FrontPage
Week 14	**Forums , class**
Week 15	Program class

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	eLearning Fundamnetals, Lesson2- Theories and Models of e-learning Towards an effective framework for the evaluation of e-learning ,Tom Franklin, Franklin Consulting Jill	No
Recommended Texts	Garrison, D. R. (2011). E–Learning in the 21st century: A framework for research and practice (2nd Edition). London: Routledge/Falmer.	No
Websites		

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

Note: Marks 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.

Module Information
معلومات المادة الدراسية

Module Title	**Internet of Things**	**Module Delivery**	
Module Type	**C**	☒ **Theory** ☒ **Lecture** ☐ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**CS414**		
ECTS Credits	**6**		
SWL (hr/sem)	**150**		
Module Level	4	**Semester of Delivery**	7
Administering Department	CS	**College**	CSI
Module Leader	Alaa Taima	**e-mail**	

Module Leader's Acad. Title	Assist. Professor	**Module Leader's Qualification**	Ph.D.
Module Tutor	Name (if available)	**e-mail**	E-mail
Peer Reviewer Name	Mustafa Yahya	**e-mail**	
Scientific Committee Approval Date	01/06/2023	**Version Number**	1.0

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	CSI121	**Semester**	2
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	1- Learn about the Internet of Things, its importance and advantages, and the benefit of the continuous development of these systems in our daily lives 2- Identifying the tasks and system models of the Internet of Things 3- Identifying the structure of models of Internet of Things systems. 4- Learn about managing the operations of Internet of Things systems and their priorities. 5- Identify the important functions in the parts of the Internet of Things
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- Enable the student to know the basics of the Internet of Things 2- Enabling the student to know and understand the functions of the Internet of Things 3- Enabling the student to know the basic functions provided by the Internet of Things systems 4- Providing students with the skills to deal with Internet of Things systems 5- Providing students with knowledge of Internet of Things protocols and

	environments 6- Enable the student to know and distinguish the environments used in the Internet of Things and classify them
Indicative Contents المحتويات الإرشادية	**Indicative content includes the following.** **Definition and characteristics ,Material design ,Logical design of , architectures and protocols the Internet of Things . [15 hrs]** **Different platforms for IOT [15 hrs]** **Revision problem classes [8 hrs]** **Real-world examples of the Internet of Things. [15hrs] IoT and M2M [15hrs]** **Reference model for the Internet of Things and Big Data and the Internet of Things . [15 hrs], sensors with Arduino . [10 hrs] . Sensors with Raspberry Pi [10 hrs]** **smart cities, Smart environment and smart home [15hrs]**

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Type something like: 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 types of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	47	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	102	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	7
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% (10)	5 and 10	LO #1, #2 and #10, #11
	Assignments	1	5% (5)	2 and 12	LO #3, #4 and #6, #7
	Projects				
	Report	1	5% (5)	13	LO #5, #8 and #10
Summative assessment	**Midterm Exam**	2hr	30% (30)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Definition and characteristics of the Internet of Things
Week 2	Material design for the Internet of Things
Week 3	Logical design for the Internet of Things
Week 4	IOT architectures and protocols
Week 5	Different platforms for the Internet of Things
Week 6	Real-world examples of the Internet of Things
Week 7	Internet of Things challenges
Week 8	IoT and M2M
Week 9	Reference model for the Internet of Things
Week 10	Big Data and the Internet of Things
Week 11	sensors with arduino
Week 12	Sensors with Raspberry Pi
Week 13	IOT cloud platforms
Week 14	smart cities
Week 15	Smart environment and smart home
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	IOT by Mehdi Hamid Khani	No
Recommended Texts	https://www.pvpsiddhartha.ac.in/dep_it/lecture%20notes/IOT/UNIT-1.pdf	No
Websites	https://www.tutorialspoint.com/internet_of_things/internet_of_things_tutorial.pdf	

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

Note: Marks 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.

Module Information
معلومات المادة الدراسية

Module Title	**Computer and Network Security**		**Module Delivery**	
Module Type	**C**		☒ **Theory** ☒ **Lecture** ☐ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**CS415**			
ECTS Credits	**4**			
SWL (hr/sem)	**100**			
Module Level	4	**Semester of Delivery**	7	
Administering Department	CS	**College**	CSI	
Module Leader	Rana Juma	**e-mail**		
Module Leader's Acad. Title	Assistant Prof.	**Module Leader's Qualification**	Ph.D.	
Module Tutor	Name (if available)	**e-mail**	E-mail	
Peer Reviewer Name	Osama Majeed	**e-mail**	E-mail	
Scientific Committee Approval Date	20/6/2023	**Version Number**	1.0	

Relation with other Modules
العلاقة مع المواد الدراسية الأخرى

Prerequisite module	CSI212	**Semester**	3
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	1. Learn about security in general and learn about computer security. 2. Understand cryptography types. 3. Learn how the intrusion and malware detection work. 4. Learn how to utilize the machine learning in security and privacy.
Module Learning	This module introduces the principles and practices of computer security with specific emphasis on practical design and engineering challenges for building secure systems.

Outcomes مخرجات التعلم للمادة الدراسية	Designed for students with a basic technical understanding of computer organization, it covers the foundations of building, using, and managing secure systems for emerging technologies such as the internet of things (IoT), machine learning, and distributed systems/blockchains. Topics will include hardware security, cyber-physical system and IoT security, machine learning security and privacy, and building secure and private distributed systems. The module covers both attacks and defenses in each topic.
Indicative Contents المحتويات الإرشادية	• Introduction to Security • Brief Introduction to Cryptography • Malware and Intrusion Detection • Hardware Trust and Trusted Execution Units • Memory Safety and Security • Machine Learning Security and Privacy • Side-Channels • Hardware Security

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 types of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ أسبوعا			
Structured SWL (hr/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	**32**	**Structured SWL (hr/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (hr/sem)	68	**Unstructured SWL (hr/w)**	5

الحمل الدراسي غير المنتظم للطالب خلال الفصل		الحمل الدراسي غير المنتظم للطالب أسبوعيا	
Total SWL (hr/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**100**		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	10% (10)	5 and 10	#1, #2 and #10, #11
	Assignments	1	5% (5)	2 and 12	#3, #4 and #6, #7
	Projects / Lab.				
	Report	1	5% (5)	13	#5, #8 and #10
Summative assessment	**Midterm Exam**	2hr	30% (30)	7	#1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to Security • Basic principles • Overview of system security. • How to establish trust in computing systems
Week 2	Brief Introduction to Cryptography • Symmetric and asymmetric cryptosystems

	• Stream ciphers and block ciphers
Week 3	Brief Introduction to Cryptography • Hash functions, MACs, and digital signatures • Advanced topics: Blockchains
Week 4	Intrusion Detection • Different types • Intrusion detections techniques •
Week 5	Malware Detection • Hardware and software malware detection • Evasive malware
Week 6	Hardware Trust Units • Basic principles of establishing trust in hardware • Attestation, TPM, and secure boot
Week 7	Trusted Execution Units • SGX and Trustzone (attacks, defenses, and use-cases) • Open-Source Enclaves
Week 8	Memory Safety and Security • Attacks (buffer-overflow, ROP, jump-oriented) • Hardware-Support for memory security • Program analysis tools and methodologies
Week 9	Machine Learning Security • Security in ML (attacks and defenses)
Week 10	Machine Learning Privacy • Privacy in ML (attacks) • Privacy-Preserving Computation
Week 11	Side-Channels • Micro-architectural side-channels • Physical Side-Channels

Week 12	Hardware Security • Hardware Trojan
Week 13	Hardware Security • Fault attacks (PMU, rowhammer)
Week 14	Hardware Security • Supply-chain security
Week 15	Hardware Security • PUF and encryption implementation

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Textbook: 3. Forouzan, B.A. and Mukhopadhyay, D., 2015. Cryptography and network security (Vol. 12). New York, NY, USA:: Mc Graw Hill Education (India) Private Limited. Er Vikrant Vij - Computer Networks-Laxmi Publications (2018) 4. Sharma, K., Gigras, Y., Sharma, V., Hemanth, D.J. and Poonia, R.C. eds., 2022. *Internet of Healthcare Things: Machine Learning for Security and Privacy*. John Wiley & Sons. 5. Tehranipoor, M. and Wang, C. eds., 2011. *Introduction to hardware security and trust*. Springer Science & Business Media.	Yes (E-copy)

Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
Success Group	**A** - Excellent	امتياز	90 - 100	Outstanding Performance

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

Note: Marks 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.

Module Information
معلومات المادة الدراسية

Module Title	**Computer Networks**	**Module Delivery**	
Module Type	**C**	☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**CS421**		
ECTS Credits	**8**		
SWL (hr/sem)	**200**		
Module Level	4	**Semester of Delivery**	8
Administering Department	CS	**College**	CSI
Module Leader	Dhiah Al-Shammary	**e-mail**	
Module Leader's Acad. Title	Assistant Prof.	**Module Leader's Qualification**	Ph.D.
Module Tutor	Name (if available)	**e-mail**	E-mail
Peer Reviewer Name	Ali Saeed	**e-mail**	E-mail
Scientific Committee Approval	20/6/2023	**Version Number**	1.0

Date			

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	CSI121	**Semester**	2
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	• Learn about communication systems in general and learn about computer networks and their classifications. • Understand network architecture, OSI models, and TCP/IP. • Learn how to encode data to be transmitted over computer networks. • Learn how to route data through the Routing network and the protocols used in it.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	• This course provides a technical and operational overview of digital computer networks, the foundation for all modern information systems and services. • It will learn about the major software and hardware technologies used on home and enterprise computer networks as well as the global Internet. • It will learn how information is encoded into digital packets, how it is transported across local networks like the one at SU, and how SU and other organizations interconnect over the Internet backbone. • This course will emphasize the critical importance of open network standards and protocols, which allow software and hardware from a variety of vendors to interoperate while also driving down the cost of network systems. • In addition to the exploring the capabilities and limitations of today's most popular networks, including Ethernet, Wi-Fi, and Cellular, we'll also cover topics closely related to networks.
Indicative Contents المحتويات الإرشادية	**1. Introduction:** Data communications, classification of computer networks, computer networks topologies, communication protocols and standards, layered tasks, the OSI model and layers, TCP/IP protocol suite, addressing. **2. Exploring the Network** Understand and describe the devices and services used to support communications in data networks and the Internet. 3. Network Protocols and Communications Understand and describe the role of protocol layers in data networks. **4. Physical Layer:**

	Data and signals, analog and digital, analog and digital signals, signals and communication, digital signals, transmission of digital signals, transmission impairments, data rate limits and transmission and performance, digital to digital conversion. **5. Data Link Layer:** Error detection and correction: introduction, CRC and checksum, framing, flow and error control. **6. Transport Layer:** Process to process delivery, Protocols: UDP, TCP and SCTP, congestion control, quality of service. **7. Application Layer Functionality and Protocols:** How do the functions of the three upper OSI model layers provide network services to end-user applications? How do the TCP/IP application layer protocols provide the services specified by the upper layers of the OSI model? How do people use the application layer to communicate across the information network?, What are the functions of well-known TCP/IP applications, such as the World Wide Web and e-mail, and their related services (HTTP, DNS, DHCP, STMP/POP, and Telnet).

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	In a computer network course, students will learn strategies to know the basic concepts of communications and computer networks, and identifies their basics, benefits, shapes, architectures, layers, functions, and possible services, in addition to how to network them.

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ أسبوعا

Structured SWL (hr/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	**64**	**Structured SWL (hr/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (hr/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	136	**Unstructured SWL (hr/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	9

Total SWL (hr/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**200**

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	5% (5)	5 and 10	#1, #2 and #10, #11
	Assignments	1	5% (5)	2 and 12	#3, #4 and #6, #7
	Projects / Lab.	15	20% (20)	Continuous	All
	Report	1	5% (5)	13	#5, #8 and #10
Summative assessment	**Midterm Exam**	2hr	15% (15)	7	#1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	General concepts of communication • Communications between devices and components of the communication system and protocols.
Week 2	General concepts about networks • Definition of networks, types of connectivity, protocols and standards.
Week 3	Network models

	• General study of network models (OSI and Internet models).
Week 4	Learn about more network models • A detailed study of the layers of network models.
Week 5	Study of the physical layer • Study data and digital and analog signals.
Week 6	Learn more about the physical class • Signals and communications, digital and analog transmissions and specifiers.
Week 7	Studying the data link layer • Study the tasks and work of the data link layer.
Week 8	Learn more about the data link layer • Error detection and correction, framing, transmission and error control.
Week 9	Network layer study • Study the functions and work of the network layer.
Week 10	Learn more about the network layer • Addressing, networking, routing concepts.
Week 11	Learn more about the network layer • Routing, routing table components, routing algorithms.
Week 12	Transport layer study • Study the tasks and work of the transport layer.
Week 13	Learn more about the transport layer • Transport layer protocols, congestion control, and quality of service.
Week 14	Learn about cables and their types • Study the types of cables and compare them and their uses.
Week 15	Learn about devices and how to connect the network • Connecting networks using cables, routers and switches.

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	General introduction about the Cisco Packet Tracer
Week 2	The basics of Cisco Packet Tracer
Week 3	Example packet tracer peer-to-peer network.
Week 4	Using the hub in Cisco Packet Tracer Simulation
Week 5	Creating a local area network (LAN) using the hub.
Week 6	Using the switch in Cisco Packet Tracer.
Week 7	Creating a LAN using the switch.
Week 8	Difference between hub and switch.
Week 9	Using the router in Cisco Packet Tracer.
Week 10	Inter-LAN communication using router.
Week 11	Creating a LAN using router
Week 12	Introduction Basics of Repeater.
Week 13	Working of repeater using Cisco Packet Tracer.
Week14	Connecting networks using cables, routers and switches.
Week15	Creating network topology using cable router, switch and repeater

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**

Required Texts	Textbook: 6. Behrouz A. Forouzan - Data Communications and Networking with TCP_IP Protocol Suite-McGraw Hill (2021) 7. Er Vikrant Vij - Computer Networks-Laxmi Publications (2018)	Yes (E-copy)

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

Note: Marks 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.

Module Information
معلومات المادة الدراسية

Module Title	**Cloud Computing**	**Module Delivery**
Module Type	**C**	☒ **Theory**
Module Code	**CS422**	☒ **Lecture**

ECTS Credits	**4**			☐ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**
SWL (hr/sem)	**100**			
Module Level			**Semester of Delivery**	8
Administering Department	4 CS		**College**	CSI
Module Leader	Lamia Abid Noor		**e-mail**	E-mail
Module Leader's Acad. Title	Professor		**Module Leader's Qualification**	Ph.D.
Module Tutor	Name (if available)		**e-mail**	E-mail
Peer Reviewer Name	Ali Saeed		**e-mail**	E-mail
Scientific Committee Approval Date	01/06/2023		**Version Number**	1.0

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	CSI121	**Semester**	2
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	To provide students with the fundamentals and essentials of Cloud Computing. To provide students a sound foundation of the Cloud Computing so that they are able to start using and adopting Cloud Computing services and tools in their real life scenarios. To enable students exploring some important cloud computing driven commercial systems and applications. To expose the students to frontier areas of Cloud Computing and information systems, while providing sufficient foundations to enable further study and research.

Module Learning Outcomes مخرجات التعلم للمادة الدراسية	After successful completion of this course, student will be able to • Explain the core concepts of the cloud computing paradigm: how and why this paradigm shift came about, the characteristics, advantages and challenges brought about by the various models and services in cloud computing. • Apply the fundamental concepts in datacenters to understand the tradeoffs in power, efficiency and cost. • Identify resource management fundamentals, i.e. resource abstraction, sharing and sandboxing and outline their role in managing infrastructure in cloud computing. • Analyze various cloud programming models and apply them to solve problems on the cloud.
Indicative Contents المحتويات الإرشادية	Recent trends in computing, evolution of cloud computing, Cloud computing (NIST model), properties, characteristics and disadvantages, role of open standards **CLOUD COMPUTING ARCHITECTURE:** Cloud computing stack, Service models (XAAS), Deployment models. **INFRASTRUCTURE AS A SERVICE**: Introduction, Hypervisors, Resource virtualization, examples. **PLATFORM AS A SERVICE**: Introduction, Cloud Platform and Management, examples. **SOFTWARE AS A SERVICE**: Introduction, Web services, Web 2.0, Web OS, examples. **SERVICE MANAGEMENT IN CLOUD COMPUTING**: Service Level Agreements (SLAs), Billing & Accounting, Comparing scaling hardware, economics of scaling, managing data. **CLOUD SECURITY**: Infrastructure security, Data security and storage, Identity and Access Management, Access Control, Trust and Reputation, Authentication in Cloud computing. **CASE STUDY ON OPEN SOURCE AND COMMERCIAL CLOUDS**: Eucalyptus, VMware Cloud.

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.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	32	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	68	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

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,
	Assignments	1	5% (5)	2, 12	LO # 3, 4
	Projects / Lab.				
	Report	1	5% (5)	13	LO # 3,4
Summative assessment	**Midterm Exam**	2 hr	30% (30)	7	LO # 1-3
	Final Exam	2hr	50% (50)	16	All

Total assessment	100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
Week 1	OVERVIEW OF COMPUTING PARADIGM
Week 2	INTRODUCTION TO CLOUD COMPUTING
Week 3	INTRODUCTION TO CLOUD COMPUTING
Week 4	CLOUD COMPUTING ARCHITECTURE
Week 5	CLOUD COMPUTING ARCHITECTURE
Week 6	INFRASTRUCTURE AS A SERVICE
Week 7	INFRASTRUCTURE AS A SERVICE
Week 8	PLATFORM AS A SERVICE
Week 9	SOFTWARE AS A SERVICE
Week 10	SOFTWARE AS A SERVICE
Week 11	SERVICE MANAGEMENT IN CLOUD COMPUTING
Week 12	SERVICE MANAGEMENT IN CLOUD COMPUTING
Week 13	CLOUD SECURITY
Week 14	CLOUD SECURITY:
Week 15	CASE STUDY ON OPEN SOURCE AND COMMERCIAL CLOUDS
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	• Barrie Sosinsky: "Cloud Computing Bible", Wiley-India, 2010	No
Recommended Texts	Rajkumar Buyya, James Broberg, Andrzej M. Goscinski: "Cloud Computing: Principles and Paradigms", Wiley, 2011	No
Websites	Introduction to Cloud Computing | Coursera	

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

Note: Marks 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.

Module Information
معلومات المادة الدراسية

Module Title	**Research Project**	**Module Delivery**	
Module Type	**C**	☒ **Theory** ☐ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**CS423**		
ECTS Credits	**6**		
SWL (hr/sem)	**150**		

Module Level	4	**Semester of Delivery**	8
Administering Department	CS	**College**	CSI
Module Leader	Qusay Omran Mosa	**e-mail**	E-mail qusay.mosa@qu.edu.iq
Module Leader's Acad. Title	Assist. Professor	**Module Leader's Qualification**	Ph.D.
Module Tutor	Name (if available)	**e-mail**	E-mail
Peer Reviewer Name	Mohamed Iqbal	**e-mail**	E-mail
Scientific Committee Approval Date	01/06/2023	**Version Number**	1.0

Relation with other Modules
العلاقة مع المواد الدراسية الأخرى

Prerequisite module	CSI121	**Semester**	2
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 develop problem solving skills and understanding of research principles. 2. To develop brain storming skills and how obtain efficient solutions. 3. Learn principles of problem analysis and critical thinking. 4. Learn programming coding in a complete projects and systems. 5. Learn the basics of benchmarking. 6. Learn basic academic writing and how to finalize a thesis.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. The ability for solving skills and understanding of research principles. 2. The ability to have brain storming skills and how obtain efficient solutions. 3. The ability to be a problem analyst and critical thinker. 4. The ability for developing programming coding in a complete projects and systems. 5. The ability to perform research benchmarking. 6. The ability to develop academic writing for research thesis.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Literature Survey</u> Students is guided to gain knowledge by working on deep literature survey about the field <u>Data preparation and organization</u> Student develops their skills in information gathering and data organization <u>develop system and project analysis</u> Students develop final required system analysis <u>System design</u> Develop complete design for the proposed system using design techniques and platforms like UML (Unified Modeling Language)

	System implementation Perform system implementation including any programming tasks Evaluation/ Experiments and Results This is completely dedicated for evaluating the proposed models by investigating specific criterion and achieve benchmarking. Thesis Writing This is completely dedicated for writing up thesis and submit for debate examination

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in delivering this module is to encourage student to read external text books and research articles, while at the same time refining and expanding their critical thinking skills. This will be achieved through library reading, electronic libraries reading and by considering laboratory simple experiments to implement the proposed project. Encourage the student to perform professional academic writing task and exercises for research thesis structure and contents.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	45	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	3

Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	105	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	7
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**				
	Assignments	2	10% (10)	5, 10	LO # 1-9
	Projects / Lab.	1	30% (30)	Continuous	All
	Report	1	10% (10)	13	LO # 1-12
Summative assessment	**Midterm Exam**				
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Data preparation and organization
Week 2	Lab 2: develop system and project analysis
Week 3	Lab 3: continue system and project analysis
Week 4	Lab 4: develop system design

Week 5	Lab 5: continue system design
Week 6	Lab 6: system implementation
Week 7	Lab 7: continue system implementation
Week 8	Lab 8: System test and investigation
Week 9	Lab 9: gathering and obtain primary results
Week 10	Lab 10: compiling and organizing results
Week 11	Lab 11: Benchmarking
Week 12	Lab 12: Finalize results and conclusions
Week 13	Lab 13: Represent and visualize results for thesis
Week 14	Lab 14: Document system design and analysis in thesis
Week 15	Lab 15: finalize thesis

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	**Available in the Library?**
Required Texts	Research Design: Qualitative, Quantitative and Mixed Methods Approaches 4th Edition, John W. Creswell, 2014	Yes
Recommended Texts	Qualitative Research: A Guide to Design and Implementation 4th Edition, Sharan B. Merriam, Elizabeth J. Tisdell, 2015	No
Websites	https://www.coursera.org/learn/research-methodologies	

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

Note: Marks 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.

Module Information معلومات المادة الدراسية					
Module Title	**Electronic Commerce**			**Module Delivery**	
Module Type	**Core**			☒ **Theory**	
Module Code	**CS424**			☒ **Lecture**	
ECTS Credits	**4**			☐ **Lab**	
SWL (hr/sem)	**100**			☐ **Tutorial**	
				☐ **Practical**	
				☐ **Seminar**	
Module Level	4		**Semester of Delivery**	8	
Administering Department	CS		**College**	CSI	
Module Leader	Gaith Hakim		**e-mail**		
Module Leader's Acad. Title	Lecturer		**Module Leader's Qualification**	Ph.D.	

Module Tutor		**e-mail**	
Peer Reviewer Name	Haider Hussein	**e-mail**	
Scientific Committee Approval Date	01/06/2023	**Version Number**	1.0

Hayder hossein jawad

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	CSI111	**Semester**	1
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	The choice of appropriate software tools and a good understanding of the main concepts and the framework of E-Commerce applications are the main key to develop an efficient E-Commerce web application. This module aims 1. To study EC Framework, major types of EC transactions, E-commerce technology and the main concept of Business Models, Business Plan, and Business Case. 2. To understand the main concept of Web Security: Electronic Payment Systems and their Security. 3. To learn how to build dynamic commercial and corporate Web site using client-side scripting with VBScript language. 4. To learn how to build dynamic commercial and corporate Web site using server-side scripting with ASP and VBScript. 5. To Integrate ASP with databases using ActiveX Data Objects (ADO). 6. To learn object-oriented programming principals. 7. To gain experience writing programs (scripts) in VBScript language, ASP and ADO technologies.
Module Learning	•

Outcomes مخرجات التعلم للمادة الدراسية	• Knowledge and understanding • Understand the process of setting up an interactive web site, displaying product catalog, deploying • shopping carts, handling credit card transaction. • Have knowledge in XML technology related to Business-to-Business E-commerce. • Be able to build an online store. • Cognitive skills (thinking and analysis). • Understand the process of setting up an interactive web site, displaying product catalog, deploying • shopping carts, handling credit card transaction. • Communication skills (personal and academic). • Understand the process of maintaining security on the E-commerce site. • Understand the process of setting up an interactive web site, displaying product catalog, deploying • shopping carts, handling credit card transaction. • Practical and subject specific skills (Transferable Skills). • Be able to build an online store. • Understand the process of setting up an interactive web site, displaying product catalog, deploying • shopping carts, handling credit card transaction. • Assessment instruments
Indicative Contents المحتويات الإرشادية	1. E-Government E-Learning Report +presentation) 3 weeks 2. Business Plan Report +presentation 3 weeks . 3. Public Key Infrastructure (Report +presentation) 2 weeks 4. Project: Part 1 E-Commerce Application (Interface) 2 weeks

	5. Project: Part 2 E-Commerce Application (Client-Side Scripting) 2 weeks 6. Project: Part 3 E-Commerce Application (Server-Side Scripting) 6 weeks

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Course module description: The ramification of electronic commerce has already been felt in many functional areas-- organizational design, marketing, finance and operations. The computerizing infrastructure that is necessary for implementing electronic commerce is becoming crucial in shaping the future of business. Relevant technology-management issues include Internet and intranet application design and deployment, business applications that leverage off the World Wide Web, firewalls and transactional security, intelligent agents, and electronic payment systems. To show how these concepts are implemented in practice, students are given hands-on experience of building an online store, through in-depth study of Active Server Pages (ASP) and database language SQL.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	32	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2

Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	68	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

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, 10 and 11
	Assignments	1	5% (5)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.				
	Report	1	5% (5)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	2 hr	30% (30)	7	LO # 1-7
	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 e-commerce: EC definitions and concepts - . EC Framework - major types of EC transactions
Week 2	E-commerce technology: Business Models - Business Plan - Business Case
Week 3	Web Security: Electronic Payment Systems - E-cards, Security for E-Payments – Introduction- First Assignment
Week 4	Web design VBScript Language Elements - Internet Information Server (IIS) Concepts
Week 5	Client Side Scripting: Browser scripting object model

	(MSIE Model) Document Object Model (DOM) Technology - HTML Intrinsic Controls
Week 6	Client Side Scripting: Shopping Card (Programming) - Product Catalog (Programming) -Second Assignment
Week 7	Active Server Pages(ASP) Concepts: IIS Server Object Model - ASP Collections
Week 8	Active Server Pages: Using the Request object - Using the Response object Third Assignment
Week 9	Active Server Pages: Example: Customer Information Form Cookies and Applications: Cookie Definition - Types of Cookies
Week 10	Cookies and Applications: Example: Read All Cookies ASP Server Components: Ad Rotator - Email Program
Week 11	Integrating with Database: Active Data Objects (ADO) Essentials Retrieving data from a database with ADO and - Displaying it with HTML - Example: building product catalog
Week 12	Integrating with Database: Adding New Records- Using the Errors Collection Example: Building a search page for product catalog
Week 13	Integrating with Database: Modifying the record -Deleting the records Fourth Assignment
Week 14	Case Study Shopping Carts
Week 15	**XML, business-to-business E-commerce Fifth Assignment**
Week 16	**Final Exam**

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	**Available in the Library?**
Required Texts	E-Commerce Programming with ASP, Walther & Levine, Sams, 2000 Mastering Active Server Pages 3, Russell Jones, Sybex inc., 2000 . Developing Distributed and E-commerce Applications, Darrel Ince, Addison Wesley, 2002	Yes

	Eric A. Smith: Active Server Page Bible, IDG Books Worldwide, Inc., 2000. Paul Lomax: Learning VBScript, O'REILLY& Associates, Inc. 1997	
Recommended Texts	Noel Jerke: E-Commerce Developer's Guide to Building Community and Using Promotional Tools, SYBEX Inc., 2001	No
Websites	www.Microsoft.com • msdn.micrsoft.com (MSDN library's documentation) • www.w3schools.com (Online Training Courses)	

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

Note: Marks 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.

Module Information
معلومات المادة الدراسية

Module Title	**Pattern Recognition**			**Module Delivery**	
Module Type	**E**			☒ **Theory** ☒ **Lecture** ☐ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**CS425**				
ECTS Credits	**4**				
SWL (hr/sem)	**100**				
Module Level	4		**Semester of Delivery**	2	
Administering Department	CS		**College**	CSI	
Module Leader	Ali Mohsin		**e-mail**		
Module Leader's Acad. Title	Assist. Prof. Dr		**Module Leader's Qualification**	Ph.D.	
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Ali Hakim		**e-mail**		
Scientific Committee Approval Date	21/06/2023		**Version Number**	1.0	

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	CSI121	**Semester**	2
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	• Identify the basic principles in distinguishing patterns. • Knowledge of the types of pattern recognition and their usage magazines. • Knowledge of patterns generation methods.

	• Identify the various operations that take place on the pattern
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	12. Introducing the student to distinguish patterns and the pattern processing system and its basic elements. 13. Introducing the student to the areas of using pattern recognition. 14. Providing the student with knowledge by extracting the pattern, how to represent it and store it in the calculator.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. 1. 1.Introduction to Pattern Recognition (2 week) 2. Basic Concepts (1 week) 3. Pattern Recognition System Design (2 week) 4. Feature Extraction (2 week) 5. Object Representation (2 week) 6. Templet Matching (1 week) 7. Clustering Techniques (3 week) 8. Classification (2 week)

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 pattern recognition 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.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	32	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	68	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

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, 10 and 11
	Assignments	1	5% (5)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.				
	Report	1	5% (5)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	2 hr	30% (30)	7	LO # 1-7
	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 Pattern Recognition
Week 2	Introduction To Pattern Recognition
Week 3	Basic Concepts
Week 4	Pattern Recognition System Design
Week 5	Pattern Recognition System Design
Week 6	Feature Extraction
Week 7	Feature Extraction
Week 8	Object Representation
Week 9	Object Representation
Week 10	Templet Matching
Week 11	Clustering Techniques
Week 12	Clustering algorithms
Week 13	Clustering algorithms
Week 14	Classification
Week 15	Classification
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Richard E. Wood, "Introduction to Pattern Recognition", 2/E, Prentice-Hall 2015	Yes
Recommended Texts	• Scott E. Umbangh, "Computer Vision and Image Processing", Prentice-Hall 1998 Nick Efford, "Digital Image Processing, a Practical Approach Using Java", Pearson Eduction 2000	No
Websites		

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

Note: Marks 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.

Module Information

معلومات المادة الدراسية					
Module Title	**Distrbuted Systems**			**Module Delivery**	
Module Type	**C**			☒ **Theory** ☒ **Lecture** ☐ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**CS426**				
ECTS Credits	**4**				
SWL (hr/sem)	**100**				
Module Level	4		**Semester of Delivery**	8	
Administering Department	CS		**College**	CSI	
Module Leader	Rana Juma		**e-mail**		
Module Leader's Acad. Title	Assistant Prof.		**Module Leader's Qualification**	Ph.D.	
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Saad Hussein		**e-mail**	E-mail	
Scientific Committee Approval Date	20/6/2023		**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	CSI121	**Semester**	2
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	• Understanding Remote Communication and Interprocess Communication • Study about various distributed client server models • Create an awareness of the major technical challenges in distributed systems design and implementation • Emerging trends in distributed computing • Understanding Distributed Shared Memory and File System
Module Learning Outcomes	On successful completion of the course: • The student will be having the basic knowledge of Distributed Computing.

مخرجات التعلم للمادة الدراسية	• Student will be able to understand Distributed Models. • To know about interposes communication and remote communication. • Student will be able to know distributed service oriented architecture. • To know about emerging trends in distributed computing. • Student will be able to know Distributed Shared Memory and File System
Indicative Contents المحتويات الإرشادية	Introduction Distributed System Concepts Basic Network Communication Interprocess and Remote Communication Distributed System Synchronization Distributed System Management Distributed Shared Memory Distributed File System Emerging Trends in Distributed Systems

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Employing these strategies can create a comprehensive and engaging learning experience in an distrbuted systems module, such as lectures, interactive discussions, hands-on lab sessions, case studies, assignments, projects, guest lectures, online resources, assessments, group projects, and continuous support.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ أسبوعا			
Structured SWL (hr/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	**32**	**Structured SWL (hr/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (hr/sem)	68	**Unstructured SWL (hr/w)**	5

الحمل الدراسي غير المنتظم للطالب خلال الفصل		الحمل الدراسي غير المنتظم للطالب أسبوعيا	
Total SWL (hr/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**100**		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	10% (10)	5 and 10	#1, #2 and #10, #11
	Assignments	1	5% (5)	2 and 12	#3, #4 and #6, #7
	Projects / Lab.				
	Report	1	5% (5)	13	#5, #8 and #10
Summative assessment	**Midterm Exam**	2hr	30% (30)	7	#1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction Distributed System Concepts: • Introduction • Distributed Computing Models • Software Concepts • Issues in Designing Distributed Systems • Client-Server Model

	• Case Studies: WWW 1.0 , 2.0 , 3.0
Week 2	Introduction Distributed System Concepts: • Software Concepts • Issues in Designing Distributed Systems • Client-Server Model • Case Studies: WWW 1.0 , 2.0 , 3.0
Week 3	Basic Network Communication: • LAN and WAN Technologies • Classification of Networks • Protocols for Network Systems • ATM • Protocols for Distributed Systems
Week 4	Basic Network Communication: • Protocols for Network Systems • ATM • Protocols for Distributed Systems
Week 5	Interprocess and Remote Communication: • Message Passing • IPC in Mach • CBCAST protocol in ISIS •
Week 6	Interprocess and Remote Communication: • RPC Introduction and Basics • RPC Implementation and Communication • Sun RPC • RMI Implementation
Week 7	Distributed System Synchronization: • Introduction • Clock Synchronization • Logical and Global state

	• Mutual Exclusion
Week 8	Distributed System Synchronization: • Election Algorithms • Deadlocks in Distributed Systems • Deadlocks in Message Communication
Week 9	Distributed System Management: • Resource Management • Task Assignment Approach • Load Balancing Approach • Load Sharing Approach •
Week 10	Distributed System Management: • Process Management and Migration • Threads • Fault Tolerance
Week 11	Distributed Shared Memory: • DSM Concepts • Hardware DSM • Design Issues in DSM Systems •
Week 12	Distributed Shared Memory: • Implementing Issues in DSM Systems • Heterogeneous and other DSM systems
Week 13	Distributed File System: • Introduction DFS • File Models • DFS Design • Semantics File Sharing • DFS Implementation • File Caching in DFS

	• Replication in DFS • Sun Network File System • Google File System
Week 14	Emerging Trends in Distributed Systems • Emerging Trends Introduction • Grid Computing • Service Oriented Architecture • Cloud Computing • The Future of Emerging Trends
Week 15	Emerging Trends in Distributed Systems • Service Oriented Architecture • Cloud Computing • The Future of Emerging Trends Discussion and reflection on the course

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Textbook: 1- Sloman, M. and Kramer, J., 1987. *Distributed systems and computer networks*. Prentice Hall International (UK) Ltd.. 2- Ölveczky, P.C., 2017. *Designing Reliable Distributed Systems*. Springer London.	Yes (E-copy)
Recommended Texts	"Operating Systems: Internals and Design Principles" by William Stallings.	Yes (E-copy)
Websites	GeeksforGeeks: https://www.geeksforgeeks.org/	

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

Note: Marks 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.

Module Information
معلومات المادة الدراسية

Module Title	**Agent and Multiple Agents**	**Module Delivery**	
Module Type	**E**	☒ **Theory** ☒ **Lecture** ☐ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	CS416		
ECTS Credits	4		
SWL (hr/sem)	100		

Module Level	4	**Semester of Delivery**	7
Administering Department	CS	**College**	CSI
Module Leader	Ali Obied Sharrad	**e-mail**	E-mail
Module Leader's Acad. Title	Professor	**Module Leader's Qualification**	Ph.D.

Module Tutor	Name (if available)	**e-mail**	E-mail
Peer Reviewer Name	Qusay O. Mosa	**e-mail**	Qusay.mosa@qu.edu.iq
Scientific Committee Approval Date	/06/2023	**Version Number**	1.0

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	CSI121	**Semester**	2
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	• Provide students with in-depth knowledge on intelligent agents • Introduce and practice how to develop intelligent agents. • Introduce and practice how multi agent work together in the same environment. • Provide student with in-depth knowledge on environment's types.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Upon completion of the subject, students will be able to: • Demonstrate knowledge and understanding of the motivation for designing intelligent machines, their implications and associated philosophical issues. • Demonstrate systematic understanding, critical awareness and application of the main kinds of state-space search algorithms, considering their strengths and limitations. • Understand and explain the main concepts and principles associated with different kinds of knowledge representation, such as logic, case-based representations, and subsymbolic/connectionist representations. • Demonstrate comprehensive understanding of how various multi agent system techniques have been used in the context of several case studies, and critically compare different techniques in the context of those case studies. • Students are able to demonstrate the applications of multi agents system working in the same environment.

Indicative Contents المحتويات الإرشادية	Indicative content includes the following. • Overview: foundations, scope, problems, and approaches of AI. [2 hrs] • Intelligent agents: reactive, deliberative, goal-driven, utility-driven, and learning agents, Artificial Intelligence programming techniques [6 hrs] • Knowledge Representation and Reasoning: ontologies, foundations of knowledge representation and reasoning, representing and reasoning about objects, relations, events, actions, time, and space; predicate logic, situation calculus, description logics, reasoning with defaults, reasoning about knowledge, sample applications. [4 hrs] • Planning: planning as search, partial order planning, construction and use of planning graphs [6 hrs] • Representing and Reasoning with Uncertain Knowledge: probability, connection to logic, independence, Bayes rule, bayesian networks, probabilistic inference, sample applications. [4hrs] • Decision-Making: basics of utility theory, decision theory, sequential decision problems, elementary game theory, sample applications. [4 hrs] • Decision under uncertainty, MDP, POMDP,HMD [8 hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Lectures provide students the main concepts of the topic, together with comprehensive examples for easy understanding. 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..

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	32	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2

Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	68	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

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, 10 and 11
	Assignments	1	5% (5)	2, 12	LO # 3, 4, 6 and 7
	Projects /				
	Report	1	5% (5)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	30% (30)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Overview: foundations, scope, problems

Week 2	Intelligent agents: reactive, deliberative, situated agent
Week 3	Intelligent agents: goal-driven, utility-driven
Week 4	Intelligent agents: learning agents, Artificial Intelligence programming techniques
Week 5	Environment types
Week 6	Complex environment conditions.
Week 7	Mid-term Exam + Unit-Step Forcing, Forced Response, the RLC Circuit
Week 8	Multi agent systems
Week 9	Reasoning with defaults, reasoning about knowledge
Week 10	Planning: planning as search, partial order planning,
Week 11	Planning: construction and use of planning graphs
Week 12	Representing and Reasoning with Uncertain Knowledge: probability, connection to logic, independence
Week 13	Decision-Making: basics of utility theory, decision theory, sequential decision problems, elementary game theory
Week 14	Decision-Making: sequential decision problems, elementary game theory, sample applications.
Week 15	Multi agent system in complex environment
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	**Available in the Library?**
Required Texts	S.J. Russell & P. Norvig, "Artificial Intelligence: a modern approach", 4th Edition. Pearson, 2020. (main textbook)	Yes

Recommended Texts	• Amit Konar, "Artificial Intelligence and Soft Computing, Behavior and Cognitive Modeling of the Human Brain", CRC Press, 2000 • George F. Luger, "Artificial Intelligence Structures and Strategies for Complex Problem Solving", Pearson Eduction Asia (Singapore), 6/E, 2009	yes
Websites	https://www.tutorialspoint.com/artificial_intelligence/index.htm	

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

Note: Marks 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.

Module Information

معلومات المادة الدراسية					
Module Title	**Visual Studio**			**Module Delivery**	
Module Type	**Elective**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	CS225				
ECTS Credits	**6**				
SWL (hr/sem)	**150**				
Module Level	2		**Semester of Delivery**	4	
Administering Department	**CS**		**College**	**CSI**	
Module Leader	Mohammed Iqbal		**e-mail**		
Module Leader's Acad. Title	Assist Professor		**Module Leader's Qualification**	Master	
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Nisreen Riyadh		**e-mail**		
Scientific Committee Approval Date	19/06/2023		**Version Number**	1.0	

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	**CSI121**	**Semester**	2
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives	This course introduces computer programming using the Visual Programming language with object-oriented programming principles. Emphasis is on event-driven programming methods, including creating and manipulating objects,

أهداف المادة الدراسية	classes, and using object-oriented tools such as the class debugger. Upon completion, students should be able to design, code, test and debug at a beginning level. This course has been approved to satisfy the Comprehensive Articulation Agreement for transferability as a pre-major and/or elective course requirement .This course will provide a managerial perspective of information systems and what role they play in an organization. Student learn about the modern technologies and how organizations can use these technologies for their growth.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1-student list the visual programming concepts . 2- Explain basic concepts and definitions . 3-Express constants and arithmetic operations. 4-Distinguish variable and data types. 5-Students code visual programs by using Visual Basic work environment. 6-Distinguish and compose events and methods. 7-Recognize and arrange control structures. 8-Design a complete program using visual programming concepts. 9-Students prepare various projects by helping visual programming. Prepare project in visual programming. 10-Manage and analyses prepared project with programs. 11-Interpret and report obtaining results.
Indicative Contents المحتويات الإرشادية	Part one Different type of Visual Programming , Graphical User Interface , The need of Visual Programming, Rapid Application Development (RAD) Tools , Advantages of Visual Programming, Disadvantages of Visual Programming, Discuss the transformation in computing, internet and application development , Identify the need for .NET ,Explain the role of CLR and Intermediate Language, Describe the core components of Microsoft .NET, Features of VS.Net , Shared IDE ,Introduction to C++, C#, Vb.Net, HTML, Javascript VBscript and ASP.NET Part 2 Introduction to Class Libraries , Properties and Methods, Events and Event Handlers , Winforms GUI , Form (Properties, Methods and Events) , Controls in Winform, Dialog Boxes ,Types of Dialog Boxes , Visual Effect in Winform, Exception , Types of Errors , Exception Classes , Properties of Exceptions,Handling Exceptions, ErrorProvider

	Control Part 3 Single Document Interface ,Multiple Document Interface , Designing an MDI application , Activating and Deactivating Windows, Describe Web applications ,Describe the Web application development cycle, Discuss Active Server Pages , Enumerate the features of ASP.NET ,Enumerate the features of ASP.NET 2.0

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 types of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	86	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	5.7
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	5% (5)	5 and 10	LO #1, #2 and #10, #11
	Assignments	1	5% (5)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	15	20% (20)	Continuous	All
	Report	1	5% (5)	13	LO #5, #8 and #10
Summative assessment	**Midterm Exam**	2hr	15% (15)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	introduction to Visual Programming
Week 2	introduction to .NET
Week 3	Introduction to Visual Studio .NET
Week 4	Working with WinForms and Controls
Week 5	Advanced User Interface Enhancement
Week 6	Error Handling in Winforms
Week 7	Mid exam
Week 8	Introduction to ADO.Net Data Access Components * ODBC * OLE DB * ADO * ADO.NET * Benefits

	of ADO.NET * ADO.Net Architecture * Components of ADO.Net * DataSet * DataTable * DataView * Connection Object * Command Object
Week 9	MDI Applications
Week 10	Introduction to Web Applications and ASP.NET
Week 11	ASP.NET and HTTP * Request/Response Programming * HttpRequest Class * HTTP Collections * HttpResponse Class * Redirection * HttpUtility Class
Week 12	Web Applications and Web Services Using Visual Studio * Using Visual Web Developer * Visual Studio Forms Designer * Using Components * Shadow Copying * Using the Global.asax File * Data Binding
Week 13	State Management and Web Applications * Session State * Application State * Multithreading Issues * Cookies
Week 14	Server Controls * HTML Server Controls * Web Forms Server Controls * Rich Controls * Validation Controls * User Controls
Week 15	ASP.NET Configuration and Security Fundamentals * Configuration Overview * Authentication and Authorization * Forms Authentication * Windows Authentication * Security and ASP.NET

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	introduction to Visual Programming
Week 2	introduction to .NET
Week 3	Introduction to Visual Studio .NET
Week 4	Working with WinForms and Controls

Week 5	Advanced User Interface Enhancement
Week 6	Error Handling in Winforms
Week 7	Mid exam
Week 8	Introduction to ADO.Net Data Access Components * ODBC * OLE DB * ADO * ADO.NET * Benefits of ADO.NET * ADO.Net Architecture * Components of ADO.Net * DataSet * DataTable * DataView * Connection Object * Command Object
Week 9	MDI Applications
Week 10	Introduction to Web Applications and ASP.NET
Week 11	ASP.NET and HTTP * Request/Response Programming * HttpRequest Class * HTTP Collections * HttpResponse Class * Redirection * HttpUtility Class
Week 12	Web Applications and Web Services Using Visual Studio * Using Visual Web Developer * Visual Studio Forms Designer * Using Components * Shadow Copying * Using the Global.asax File * Data Binding
Week 13	State Management and Web Applications * Session State * Application State * Multithreading Issues * Cookies
Week 14	Server Controls * HTML Server Controls * Web Forms Server Controls * Rich Controls * Validation Controls * User Controls
Week 15	ASP.NET Configuration and Security Fundamentals * Configuration Overview * Authentication and Authorization * Forms Authentication * Windows Authentication * Security and ASP.NET

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Reference Books: J.C. Bradley, A.C. Millspaugh, "Programming	No

	in C# .NET", McGrawHill, 2014, ISBN 0-07-121564-6.	
Recommended Texts	Books: Deitel and Deitel, "Visual C# : How to Program", 6/e Edition, Prentice Hall / Pearson Education, 2017, ISBN 978-0-13-650154-0.	No
Websites		

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

Note: Marks 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.

Module Information

معلومات المادة الدراسية

Module Title	**Computer Vision**	**Module Delivery**
Module Type	E	☒ **Theory**
Module Code	**CS427**	☒ **Lecture**

ECTS Credits	**4**			☐ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
SWL (hr/sem)	**100**				
Module Level	4		**Semester of Delivery**	2	
Administering Department	CS		**College**	CSI	
Module Leader	Ali Mohsin		**e-mail**		
Module Leader's Acad. Title	Assist. Prof.		**Module Leader's Qualification**	Ph.D.	
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Ali Hakim		**e-mail**		
Scientific Committee Approval Date	21/06/2023		**Version Number**	1.0	

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	CSI121	**Semester**	2
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	• Enables the student to obtain knowledge in the field of image analysis and how to model the image • The student can discover the edges of the objects in the different pictures. • How to cut images and how to match two-dimensional shapes in images, • And how to analyze medical images. Which gives the student the necessary knowledge in the field of pattern recognition research.
Module Learning	

Outcomes مخرجات التعلم للمادة الدراسية	• Introducing the student to made the computer to analysis the image • Introducing the student to the areas of using computer vision. • Providing the student with knowledge by extracting the information from image, how to represent it and store it in the calculator.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. • Introduction to computer vision (1 week) • Computer imaging (1 week) • Computer vision application (1 week) • Image analysis (1 week) • System model (1 week) • Noise removal (1 week) • Quantization (1 week) • Histogram operations (1 week) • Feature extraction (1 week) • Feature matching (1 week) • Computer vision technique (1 week) • OCR (1 week) • CBIR (1 week) • Edge detection (1 week) • Corner detection (1 week)

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 computer vision 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.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	32	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	68	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

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, 10 and 11
	Assignments	1	5% (5)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.				
	Report	1	5% (5)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	30% (30)	7	LO # 1-7
	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 computer vision
Week 2	Computer Imaging
Week 3	Computer vision and image processing application
Week 4	Image analysis
Week 5	System model of computer vision
Week 6	Noise removal
Week 7	Quantization
Week 8	Histogram operations
Week 9	Feature extraction
Week 10	Feature matching
Week 11	Computer vision technique
Week 12	OCR
Week 13	CBIR
Week 14	Edge detection
Week 15	**Corner detection**
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	**Available in the Library?**
Required Texts	Richard E. Wood, "Introduction to Pattern	Yes

	Recognition", 2/E, Prentice-Hall 2015	
Recommended Texts	• Scott E. Umbangh, "Computer Vision and Image Processing", Prentice-Hall 1998 Nick Efford, "Digital Image Processing, a Practical Approach Using Java", Pearson Eduction 2000	No
Websites		

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

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