MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Algorithms and Structured Programming (2)** الخوارزميات والبرمجة المهيكلة(2)			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☒ **Practical** ☐ **Seminar**	
Module Code	**UOMAI205**				
ECTS Credits	**8**				
SWL (hr/sem)	**200**				
Module Level	UGI - 5		**Semester of Delivery**	Two (2)	
Administering Department	Artificial Intelligence		**College**	**Computer Science and Mathematics**	
Module Leader	Baydaa Sulaiman Bahnam		**e-mail**	baydaa_sulaiman@uomosul.edu.iq	
Module Leader's Acad. Title	Assist. Prof.		**Module Leader's Qualification**	MSc.	
Module Tutor			**e-mail**		
Peer Reviewer Name			**e-mail**		
Scientific Committee Approval Date	10/10/2024		**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	**Algorithms and Structured Programming (1)**	**Semester**	1
Co-requisites module	None	**Semester**	2

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	1. Improve Problem-Solving Skills: Enable students to analyze problems, break them down into smaller components, and design appropriate solutions using a systematic approach. 2. Master Advanced C++ Programming: Teach students the advanced data types, control structures, and functions of the C++ programming language. 3. Code Modularity Concepts: Teach students how to write modular code using different concepts like functions, libraries, and object-oriented programming principles. 4. Promote Effective Programming Practices: Instill good programming habits, such as code documentation, proper naming conventions, and writing readable and maintainable code. 5. Apply Programming Skills to Real-World Problems: Provide opportunities for students to apply their programming knowledge to solve practical problems and develop software applications. 6. Operating System Programming: Teach student how to connect their programmer to operating system and how to work with files and directories. 7. Cultivate Collaboration and Teamwork: Encourage students to work collaboratively on programming projects, fostering effective communication, problem-solving, and collaboration skills. 8. Report Writing and Presentation: Prepare the student on how to write reports and present their work for the class. 9. Decision Making: Communicate design decisions for the selection, storage and manipulation of data. 10. Prepare for Future Courses: Prepare students for upcoming courses in the collage, with related to programming.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Important: Write at least 6 Learning Outcomes, better to be equal to the number of study weeks. 1. Practice professional C++ programming. 2. Summarize code modularity and reusage. 3. Communicate and Document Code. 4. Work collaboratively in teams. 5. Apply programming skills to Real-World scenarios. 6. Prepare for future programming concepts.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: Part A – function: Definition of functions, Examples, Definition of default argument, Definition of recursive functions, Definition of call by reference functions [20 hrs] Part B – arrays: Definition of 1D, Examples, Definition of 2D, main and second diagonal, examples [20 hrs] Part C – string: Definition of string, read and write string, Definition of string function, examples [15 hrs]

	Part D- structures: Definition of structures, read structure, write structures, examples, Definition of nested structure, examples [20 hrs] Part E - files: Definition files, Open files, closing files, file Input/Output Operations[20 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	93	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	6
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	107	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	7
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	10% (10)	5 and 10	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	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	Review of the Introduction to Problem Solving and Programming (1)
Week 2	Functions (Function Declaration, Function types , Default argument function, Function Call , Return types, Local and global variables).
Week 3	Functions (Function, Passing Parameters (Passing by Value, Passing by Reference), Recursive function
Week 4	Arrays (Array of One Dimension (Declaration of Arrays, Initializing Array Elements, Accessing Array Elements, Read / Write / Process Array Elements)
Week 5	Arrays (Array of One Dimension (Declaration of Arrays, Initializing Array Elements, Accessing Array Elements, Read / Write / Process Array Elements)
Week 6	Array of Two Dimension (Declaration of 2D-Arrays, Initializing 2D-Array Elements, Read / Write / Process Array Elements))
Week 7	Array of Two Dimension (Declaration of 2D-Arrays, Initializing 2D-Array Elements, Read / Write / Process Array Elements))
Week 8	Array of Two Dimension (Declaration of 2D-Arrays, Initializing 2D-Array Elements, Read / Write / Process Array Elements))
Week 9	String (Read / Write / Process Array Elements, Member Function of String, cstdlib Library)
Week 10	String (Read / Write / Process Array Elements, Member Function of String, cstdlib Library)
Week 11	String (Read / Write / Process Array Elements, Member Function of String, cstdlib Library)
Week 12	Structures (The Three Ways for Declare the Structure, Array of Structures)
Week 13	Structures (The Three Ways for Declare the Structure, Array of Structures)
Week 14	Files (opening and closing files, file Input/Output Operations)
Week 15	Files (file Input/Output Operations)
Week 16	**Final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Additional application and review of Problem Solving and Programming (1) Default argument functions
Week 2	Lab 2: Function types according to whether it take arguments and/or return a value or not.
Week 3	Lab 3: Call by reference function
Week 4	Lab 4: Recursive function
Week 5	Lab 5: One-Dimensional Arrays
Week 6	Lab 6: Two-Dimensional Arrays
Week 7	Lab 7: Two-Dimensional Arrays and Arrays Manipulation with Functions
Week 8	Lab 8: Two-Dimensional Arrays and Arrays Manipulation with Functions

Week 9	Lab 9: Strings (Character Arrays)
Week 10	Lab 10: String Manipulation with functions
Week 11	Lab 11: String Manipulation with functions
Week 12	Lab 12: Structures and Arrays of structures
Week 13	Lab 13: Nested structures and Arrays of structures
Week 14	Lab 14: File Operations: Open/Close and Input/Output Operations with files
Week 15	Lab 15: File Operations: Open/Close and Input/Output Operations with files

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Mastering C++ by Sorhan Sami & Oqeli Saleh 2002	Yes
Recommended Texts	Practical C++ programming C++ from control structures through objects, eighth edition, by Tony Gaddis	No
Websites	https://books.google.iq/books?hl=en&lr=&id=-6fdDwAAQBAJ&oi=fnd&pg=PT3&dq=complete+guide+programming+in+c%2B%2B&ots=xYG363hrHS&sig=O0nZEquCDPXc8SDIQliLS3nWeuc&redir_esc=y#v=onepage&q=complete%20guide%20programming%20in%20c%2B%2B&f=false	

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 DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Computer Organization تركيب الحاسوب			**Module Delivery**	
Module Type	**Core**			☒ **Theory**	
Module Code	**UOMAI203**			☒ **Lecture**	
ECTS Credits	**6**			☒ **Lab**	
SWL (hr/sem)	**150**			☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Level	UGI - 2		**Semester of Delivery**	One (1)	
Administering Department	Artificial Intelligence	**College**	**Computer Science and Mathematics**		
Module Leader	Dr. Ban Shareef Mustafa	**e-mail**	banmustafa66@uomosul.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	Name	**e-mail**	E-mail		
Scientific Committee Approval Date	10/10/2024	**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. To understand the difference between computer architecture and organization. 2. Describe the different types of computers. 3. To understand the organization of computers and their various units. 4. Describe the bus structures in detail and their interconnections. 5. Describe the input/output interface and devices. 6. Explain the significance of I/O channels and processors. 7. Understand the characteristics of memory systems. 8. Explain memory system design and hierarch. 9. Understand the architecture of 8086/8088. 10. Impart the knowledge about the instruction set. 11. To understand the basic idea of data transfer schemes and their applications. 12. Develop Skills in simple program writing for 8086 and applications. 13. To develop problem-solving skills and an understanding of circuit theory through the application of techniques.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	On completion of the course, students will be able to: 1. Demonstrate computer architecture concepts related to the design of modern processors, memories, and I/Os. 2. Analyze the performance of commercially available computers. 3. Understand the optimal usage of registers of processors in programming. 4. Apply knowledge and demonstrate programming proficiency using the target microprocessor and microcontroller's various addressing modes and data transfer instructions. 5. Demonstrate programming proficiency using the target Arithmetic instruction and logic instructions. 6. To Develop a report to generate a code for applications using assembly language programming to meet societal requirements.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Unit I: Computer Fundamentals: Comparison of Computer Organization &Architecture, Computer Components Functions, Interconnection Structures, basic Operational concepts, Processor Organization and Register Organization, Instruction Cycle, Bus Structures, Input / Output: I/O Module, Von Neumann Architecture, Microprocessors and Microcomputers, General Architecture of a Microcomputer System. [15 hrs] UNIT II: Memory Concepts and Hierarchy: Classification and design parameters, Memory Hierarchy, Multilevel Memory, Internal Memory: RAM, SRAM and DRAM, ROM chips, Interleaved and Associative Memory. Cache Memory, Virtual Memory, External Memory: Magnetic Discs, Optical Memory, Flash Memories. [5 hrs] UNIT III: Processor Organization: Introduction to Microprocessors and Microcomputers, the Software architecture of 8088/8086 microprocessors, Memory Address Space & Data Organization, Assembly

	Language Programming Development on the PC, Instruction set architecture, Addressing mode, The PC & its DEBUG Program, Examining & Modify the Contents of Memory, Debugging Program (Assemble Command), Data transfer instructions, Arithmetic instructions, Logic Instructions, The Architecture of the Intel 8088/8086 CPU Architecture, Inside the 8086 Microprocessor, Fetch and Execute, Reading/Writing Data. [50 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 discussions, while at the same time refining and expanding their critical thinking skills. This will be achieved through: 1. Lectures - aim to deliver concepts and fundamental knowledge relation. 2. Tutorial sessions - are deployed to illustrate the application of fundamental knowledge of assembly language programming to different practical problems. 3. Assignments - are arranged to provide the opportunity for students to search for information, analyze problems and model their programs, with knowledge obtained, and present the completed tasks. 4. Computer sessions - to develop actual computer codes to solve simple experiments, and thus the use of assembly language to implement different instructions is an important part of the subject.

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

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	87	**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	10% (10)	5 and 11	LO #3, #4, #9 and #10
	Assignments	2	10% (10)	5, 12, 13, 15	LO #4, #11, #12 and #14
	Projects / Lab.	1	10% (10)	Continuous	All

	Report	1	10% (10)	13	LO #5, #8 and #10
Summative assessment	**Midterm Exam**	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (60)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Functional units, basic Operational concepts, Bus structures
Week 2	Software, Performance, Multiprocessors, Multicomputer
Week 3	Data Representation: Signed number representation, fixed and floating-point Representations
Week 4	Computer Arithmetic: Addition and subtraction, multiplication Algorithms, Division Algorithms
Week 5	Error detection and correction codes
Week 6	Register Transfer Language and Micro Operations: RTL- Registers, Register transfers, Bus and memory transfers
Week 7	Micro operations: Arithmetic, Logic, and Shift microoperations, Arithmetic logic shift unit.
Week 8	Basic Computer Organization and Design: Computer Registers, Computer instructions, Instruction cycle.
Week 9	Instruction codes, Timing and Control, Types of Instructions: Memory Reference Instructions, Input – Output and Interrupt.
Week 10	Central Processing Unit: General Register Organization, Stack organization, Instruction formats, Addressing modes, Data Transfer and Manipulation, Program Control, CISC and RISC processors
Week 11	Control unit design: Design approaches, Control memory, Address sequencing, micro program example, design of CU. Micro Programmed Control.
Week 12	Memory Organization: Semiconductor Memory Technologies, Memory hierarchy, Interleaving, Main Memory-RAM and ROM chips, Address map, Associative Memory-Hardware organization.
Week 13	Match logic. Cache memory-size vs. block size, Mapping functions Associate, Direct, Set Associative mapping.
Week 14	Replacement algorithms, write policies. Auxiliary memory.
Week 15	Input –Output Organization: Peripheral devices, Input-output subsystems, I/O device interface, I/O Processor, I/O transfers–Program controlled, Interrupt driven, and DMA, interrupts and exceptions. I/O device interfaces – SCII.
Week 16	**Final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: The PC & its DEBUG Program

Week 2	Lab 2: Examining & Modify the Contents of Memory (Dump command, Data Entry Commands)
Week 3	Lab 3: Move & compare commands
Week 4	Lab 4: debugging program (assemble command and unassembled command, trace command)
Week 5	Lab 5: General purpose registers, Pointer register & instruction pointer
Week 6	Lab 6: Registers commands & flag register
Week 7	Lab 7: Registers commands & flag register
Week 8	Lab 8: Write & execute the program in the debugger by applying MOV inst.
Week 9	Lab 9: Write & execute the program in the debugger by applying MOV inst.
Week 10	Lab 10: Use data transfer instructions in programming
Week 11	Lab 11: Use data transfer instructions in programming
Week 12	Lab 12: Use Arithmetic instruction programming
Week 13	Lab 13: Use Arithmetic instruction programming
Week 14	Lab 14: Use Arithmetic instruction programming
Week 15	Lab 15: Exam

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	• Computer Organization – Carl Hamacher, Zvonks Vranesic, SafeaZaky, Vth Edition, McGraw Hill. • Computer Systems Architecture – M.Moris Mano, IIIrd Edition, Pearson/PHI	yes
Recommended Texts	Barry B. Brey, "8086/8088, 80186/80188, 80286, 80386, 80486, Pentium, Pentium Pro Processor, Pentium II, Pentium III, Pentium 4, and Core2 with 64-Bit Extensions Architecture, Programming, and Interfacing", Eighth Edition 2009.	Yes
Websites	https://www.tutorialspoint.com/computer_organization/index.asp	

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 DESCRIPTION FORM

Module Information					
Module Title	**English Language**			**Module Delivery**	
Module Type	**Basic**			☒ **Theory** ☐ **Lecture** ☐ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**UOM102**				
ECTS Credits	**2**				
SWL (hr/sem)	**50**				
Module Level		UGI – 6	**Semester of Delivery**		Two (2)
Administering Department		Artificial Intelligence	**College**	Computer Science and Mathematics	
Module Leader			**e-mail**		
Module Leader's Acad. Title		Assistant Lecturer	**Module Leader's Qualification**		MSc.
Module Tutor			**e-mail**		
Peer Reviewer Name			**e-mail**		
Scientific Committee Approval Date		10/10/2024	**Version Number**		1.0

Relation with other Modules			
Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents	
Module Objectives	1. To be able to speak English fluently and accurately. 2. To think in English and then speak. 3. To be able to talk in English. 4. To be able to compose freely and independently in speech and writing. 5. To be able to read books with understanding.
Module Learning Outcomes	1. To address grammar issues that students encounter in their daily speech, writing, reading, and listening. 2. To address the issue of grammatical errors that affect effective communication.

	3. To improve your reading skills through the practice of vocabulary enrichment, reading comprehension exercises, speed reading strategies, written responses, discussions, and reflections. 4. Recognize the structure and organization of paragraphs. 5. Use strategies to think critically about reading and use appropriate technology to enhance reading comprehension, reading speed, and vocabulary development. 6. Develop the writing skill.
Indicative Contents	Indicative content includes the following: Introduction: about new headway pre-intermediate plus [5 hrs] Tenses: past-present-future, wh- questions. Vocabulary- using a bilingual dictionary, reading (communication). Everyday English (social expressions) [5 hrs] Grammar: Review about tenses, Present tenses, have and have got. Vocabulary: about (daily life), listening and match between verb and nouns. Practices about simple present and present continuous, Reading: about living in the USA. Social expressions about every day English. [10 hrs] Past tenses, simple past and past continuous, practice, Reading and listening, regular and irregular verbs. Vocabulary: about N.- V.- Adj. endings. Everyday English (time expressions). [10hrs] Grammar: the quantities, also about Something/someone/somewhere, practices. Reading: about markets, practices. [12 hrs]

Learning and Teaching Strategies	
Strategies	he main strategy that will be adopted in developing the four skills: The skill of speaking, The skill of reading, The skill of writing, The skill of listening, Also, enable the students for the use of grammar correctly.

Student Workload (SWL)			
Structured SWL (h/sem)	33	**Structured SWL (h/w)**	2
Unstructured SWL (h/sem)	17	**Unstructured SWL (h/w)**	1
Total SWL (h/sem)	**50**		

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

Formative assessment	**Quizzes**	1	10% (10)	5, 10 and 12	LO #1, #2 and #10, #11
	Assignments	2	20% (20)	2,5 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	0	0% (0)	Continuous	All
	Report	1	10% (10)	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)

	Material Covered
Week 1	Introduction
Week 2	Speaking, reading, and listing
Week 3	Speaking, reading, and listing
Week 4	Meeting People and Jobs in IT
Week 5	schedules, spelling and industry
Week 6	past simple tense and present simple tense
Week 7	past simple tense and present simple tense
Week 8	working in the IT
Week 9	Prepositions of time
Week 10	Computer systems
Week 11	Computer hardware
Week 12	computer software
Week 13	working with computers
Week 14	Comparatives, Present continuous
Week 15	Comparatives, Present continuous
Week 16	**Final Exam**

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	**Available in the Library?**
Required Texts	• English for information technology , 1 vocational English, course book, Maja Olejniczak, series editor David Bonamy • Headway pre-intermediate plus student's book. (John and Liz Soars)	Yes

Recommended Texts	Headway pre-intermediate plus work's book	Yes
Websites	https://www.youtube.com/watch?v=WOVu22J_sN8	

Grading Scheme				
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 DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Knowledge Representation تمثيل المعرفة**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**UOMAI206**				
ECTS Credits	**6**				
SWL (hr/sem)	**150**				
Module Level		UGI – 7	**Semester of Delivery**		Two (2)
Administering Department		Artificial Intelligence	**College**	**Computer Science and Mathematics**	
Module Leader	Dr. Luma Akram Abdullah		**e-mail**	**Luma.akram@uomosul.edu.iq**	
Module Leader's Acad. Title			**Module Leader's Qualification**		
Module Tutor	Noor Ammar		**e-mail**	noor.ammar@uomosul.edu.iq	
Peer Reviewer Name			**e-mail**	None	
Scientific Committee Approval Date		10/10/2024	**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 objectives of a Knowledge Representation (KR) module are as follows: 1. **Structured Knowledge Modeling**: To represent real-world information, concepts, relationships, and processes in a formal, structured format that can be easily processed by computational systems. 2. **Enabling Inference and Reasoning**: To facilitate automated reasoning capabilities, allowing the system to derive new knowledge from existing data and make informed decisions based on that knowledge. 3. **Managing Complex Data**: To represent and manage complex, ambiguous, incomplete, or contradictory data in a way that ensures it can be understood, interpreted, and used by the system. 4. **Maintaining Consistency**: To ensure the integrity and consistency of the knowledge base, even as new information is introduced or existing data is modified. 5. **Facilitating Learning**: To support continuous learning by enabling the system to update and refine its knowledge base based on new inputs or experiences. 6. **Enabling Knowledge Sharing**: To create a framework that promotes the exchange of knowledge across different systems, users, and domains, ensuring interoperability and fostering collaboration. 7. **Optimizing Problem Solving**: To improve the system's problem-solving capabilities by providing an organized, easily accessible knowledge base for efficient retrieval and processing of relevant information. 8. **Supporting Explainability**: To ensure that the system's reasoning processes and decisions can be understood and explained in a manner that is transparent and accessible to human users, thereby increasing trust and reliability. 9. **Enhancing Decision-Making**: To enable data-driven, informed decision-making by organizing and structuring relevant knowledge in a way that it can be effectively accessed and applied in a given context. 10. **Ensuring Scalability**: To design the knowledge representation system to accommodate the increasing volume, complexity, and variety of data, ensuring it remains effective as the system grows. These objectives aim to establish a comprehensive and effective framework for organizing, retrieving, and utilizing knowledge, empowering systems to make accurate, relevant, and context-aware decisions.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Knowledge and understanding: at the end of the course the students should be acquainted with the broad principles of knowledge representation, such as the separation of representation and reasoning, the declarative nature of representations, and the universal (domain-independent) nature of inference mechanisms. Apply knowledge and understanding: students will have practical experience with different representation formalisms and be able to implement a reasoning tool for at least one of these formalisms. This will allow them to better understand the role of knowledge representation in the broader context of AI.

	Making judgment: students will be able to set up empirical experiments to evaluate the pros and cons of Knowledge Representation formalisms in specific application areas. Communication skills: students can write a scientific report about an original research question in a small group of students. Learning Outcomes: Students will develop the ability to acquire knowledge about a range of complex formal systems, formulate research questions and scientific hypotheses, and conduct the requisite empirical research to validate or refute these hypotheses.
Indicative Contents المحتويات الإرشادية	**Indicative Contents of Knowledge Representation (KR)** 1. **Introduction to Knowledge Representation** o Definition and importance of KR o Overview of KR in artificial intelligence and cognitive science o Key challenges in representing knowledge 2. **Types of Knowledge** o Declarative vs. procedural knowledge o Explicit vs. tacit knowledge o Structured vs. unstructured knowledge 3. **Formal Logics for Knowledge Representation** o Propositional logic and predicate logic o Modal logic and non-monotonic reasoning o Description logics and their applications 4. **Semantic Networks** o Structure and components of semantic networks o Representation of concepts and relationships o Applications in natural language processing and AI systems 5. **Frames and Ontologies** o Structure and use of frames in KR o Ontology design and representation o The role of ontologies in semantic web and knowledge integration 6. **Rule-Based Systems** o Knowledge representation using rules o Forward and backward chaining o Expert systems and their applications 7. **Graph-Based Knowledge Representation** o Knowledge graphs and their construction o Graph-based reasoning and applications o Relationship between nodes, edges, and attributes 8. **Uncertainty and Incomplete Knowledge** o Handling uncertainty in KR (e.g., probabilistic reasoning) o Representing incomplete or contradictory knowledge o Fuzzy logic and its applications 9. **Inference and Reasoning Mechanisms** o Deductive vs. inductive reasoning o Logical inference and automated reasoning tools o Challenges in reasoning over large-scale knowledge bases 10. **Applications of Knowledge Representation** o Expert systems, decision support systems, and AI applications o Natural language processing and understanding

	○ Knowledge representation in robotics and machine learning 11. **Evaluation and Testing of Knowledge Representation Models** ○ Metrics for assessing KR models ○ Validity, consistency, and completeness in KR systems ○ Performance evaluation of reasoning mechanisms 12. **Future Trends in Knowledge Representation** ○ Advances in KR for AI and machine learning ○ Integration with big data and cloud computing ○ Ethical considerations and challenges in KR development

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	**Learning and Teaching Strategies for Knowledge Representation (KR)** 1. **Lectures and Theoretical Sessions**: Deliver foundational knowledge on the principles, techniques, and methodologies used in Knowledge Representation, including formal logic, semantic networks, ontologies, and knowledge graphs. These sessions will provide students with a solid understanding of the core concepts and theories underlying KR. 2. **Hands-On Workshops and Practical Exercises**: Facilitate interactive sessions where students can apply theoretical concepts to real-world scenarios. These workshops will focus on practical skills such as designing knowledge representations, implementing inference mechanisms, and using KR tools and software. 3. **Case Studies and Problem-Based Learning**: Utilize case studies to illustrate the application of KR in various domains, such as artificial intelligence, expert systems, and natural language processing. Problem-based learning approaches will encourage students to analyze complex problems and develop KR solutions. 4. **Collaborative Learning and Group Projects**: Encourage teamwork through group projects that involve the creation of knowledge representations for specific domains or applications. Collaborative learning helps students develop critical thinking, communication, and problem-solving skills. 5. **Research and Independent Study**: Guide students in conducting independent research to explore specific KR topics in greater depth. Students will be encouraged to investigate advanced KR techniques, emerging trends, and the application of KR in different fields. 6. **Interactive Discussions and Seminars**: Foster an interactive learning environment where students can engage in discussions, share ideas, and critically evaluate different KR approaches. Seminars will provide a platform for students to present their research, findings, and solutions to peers. 7. **Use of Software Tools and Simulations**: Incorporate the use of KR tools and simulation software to provide hands-on experience in building and managing knowledge bases. This will allow students to gain practical skills in working with real-world datasets and applying KR techniques to solve complex problems.

	8. **Assessment through Practical Assignments and Exams**: Assess students' understanding and ability to apply KR concepts through practical assignments, projects, and written exams. The focus will be on both theoretical knowledge and practical application of KR methods. 9. **Feedback and Reflection**: Provide regular feedback on assignments, projects, and exams, encouraging students to reflect on their learning and improve their understanding of KR. This feedback loop helps ensure continuous learning and development.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	87	**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	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	3 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to knowledge-based technologies and knowledge representation
Week 2	Propositional Logic as a simple knowledge representation language

Week 3	Classical logic and knowledge representation
Week 4	Logic programming and answer set programming
Week 5	Reasoning about actions and planning
Week 6	Ontology
Week 7	linked data and the Semantic Web
Week 8	linked data and the Semantic Web
Week 9	Probability: Bayesian networks, Markov networks
Week 10	Probability: Bayesian networks, Markov networks
Week 11	Combining logic and probability: Markov Logic, Probabilistic Soft Logic
Week 12	Combining logic and probability: Markov Logic, Probabilistic Soft Logic
Week 13	LPMLN
Week 14	Applications of KRR
Week 15	Applications of KRR
Week 16	**Final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lists and List Operations
Week 2	Introduction to lists in Prolog
Week 3	Manipulating lists: head, tail, length, append, member, etc.
Week 4	Defining recursive predicates for list operations
Week 5	Hands-on exercises: Solving problems involving list processing (e.g., reversing a list, summing elements)
Week 6	More Complex Data Structures
Week 7	Introduction to compound terms and structures in Prolog
Week 8	Using facts with multiple arguments and more complex relationships
Week 9	Representing trees, graphs, and other data structures
Week 10	Hands-on exercises: Defining complex relationships using compound terms
Week 11	Input/Output and File Handling in Prolog
Week 12	Reading from and writing to files in Prolog

Week 13	Using Prolog's built-in predicates for file handling
Week 14	Hands-on exercises: Implementing I/O operations in Prolog, such as saving and reading knowledge bases from files
Week 15	Prolog in Problem Solving (Search Problems)

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	• *George F. Luger, "Artificial Intelligence structures and strategies for complex problem solving". 2008* • *Max Bramer, "Logic Programming with prolog ", spring, 2005.*	Yes
Recommended Texts	SWI Prolog Reference Manual Updated for version 6.2.2, September 2012 Jan Wielemaker J.Wielemaker@vu.nl http://www.swi-prolog.org	
Websites	https://www.tutorialspoint.com/prolog/prolog_quick_guide.htm https://athena.ecs.csus.edu/~mei/logicp/exercises.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 DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Mathematics for AI** **الرياضيات للذكاء الاصطناعي**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**UOMAI202**				
ECTS Credits	**4**				
SWL (hr/sem)	**100**				
Module Level		UGI - 3	**Semester of Delivery**		Two (2)
Administering Department		Artificial Intelligence	**College**		Computer Science and Mathematics
Module Leader	Dr. Zeyad Abd-Algfoor Hasan		**e-mail**		drzeyad@uomosul.edu.iq
Module Leader's Acad. Title			**Module Leader's Qualification**		Ph.D.
Module Tutor	Name (if available)		**e-mail**		E-mail
Peer Reviewer Name		Shrooq Mohammed	**e-mail**		shrooq.mohammed@uomosul.edu.iq
Scientific Committee Approval Date		02/01/2024	**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	This module provides students with some fundamental mathematical concepts relevant to applications in AI and CE. The focus will be on applying mathematical proofs to solve computer science problems as well as introducing basic concepts and techniques in linear algebra and calculus. In addition to theoretical treatments, there will be laboratory applications using Python and Jupyter to visualize, manipulate and explore mathematics.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	• Critically appraise various mathematical approaches to analyzing a given data set. • Select and apply suitable techniques to solve relevant AI and Data Science problems in calculus, linear algebra, and probability • Analyze and apply periodic functions. • Summarize how mathematical approaches can be applied to AI and Data Science problems.
Indicative Contents المحتويات الإرشادية	• Understand key mathematical concepts such as linear algebra, probability, statistics, calculus, and optimization. • Grasp the role of these concepts in the context of AI models and algorithms. • Use matrices, vectors, and tensors to represent and process data in AI applications. • Analyze probabilistic models and handle uncertainty in decision-making. • Perform optimization to train AI models efficiently.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The course focus on a blend of theoretical instruction and practical application. Lectures will introduce key mathematical concepts, while problem-based and project-based learning will enhance critical thinking and problem-solving skills. Hands-on coding using a tool like Python will bridge theory with AI applications. The classroom approach will encourage active participation, and collaborative learning will foster teamwork. Visualization techniques will simplify complex topics, and case studies will provide real-world insights.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	37	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3

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	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	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	Properties of exponents (product, power, and quotient rules) Negative and zero exponents
Week 2	Square roots and higher-order radicals, Conversion between radicals and fractional exponents, Solving radical equations.
Week 3	Definition and properties of factorials. Introduction to permutations and combinations. Applications in probability and counting problems.
Week 4	Summation notation and properties, Arithmetic and geometric series, Practical applications in finance and data analysis
Week 5	Converting between standard and scientific notation. Operations with numbers in scientific notation.
Week 6	Scalars vs. vectors. Operations on scalars.
Week 7	Midterm
Week 8	Vector addition, subtraction, and scalar multiplication. Dot product and cross product.
Week 9	Matrix addition, multiplication, and inverses
Week 10	Basics of tensors and their ranks
Week 11	Singular Value Decomposition (SVD) Understanding the decomposition. Applications in image compression and data analysis.

Week 12	Principal Component Analysis (PCA). Steps of PCA. Eigenvalues/eigenvectors in PCA.
Week 13	Derivatives Basic differentiation rules. Partial derivatives.
Week 14	Vector/Matrix Calculus. Gradient, divergence, and curl. Jacobian and Hessian matrices.
Week 15	Gradient Algorithms. Gradient descent and variants (e.g., stochastic, batch).
Week 16	Final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Introduction to Equations, Linear Equations.
Week 2	Systems of Equations
Week 3	Exponentials, Radicals, and Logs
Week4	Standard Form for Polynomials
Week 5	Factors of Polynomial Expressions
Week 6	Quadratic Equations, Functions
Week 7	**Midterm**
Week 8	Linear Rate of Change
Week 9	Vectors, Vector Multiplication
Week 10	Matrices and Matrix Notation (Adding Matrices, Subtracting Matrice, Matrix Transposition)
Week 11	Differentiation and Derivatives
Week 12	Critical Points and Optimization
Week 13	Partial Derivatives
Week 14	Integration
Week 15	Data and Data Visualization
Week 16	**Final Exam**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	**Linear Algebra and its Applications** by David C. Lay	NO
Recommended Texts	**Numerical Linear Algebra** by Lloyd N. Trefethen and David Bau	NO
Websites	1) **Linear Algebra" by Gilbert Strang (MIT OpenCourseWare)** • Comprehensive video lectures and notes. 2) **Khan Academy**	

	• Covers exponents, radicals, summations, and calculus with interactive examples. 3) **3Blue1Brown (YouTube)** • Excellent visual explanations of linear algebra, eigenvalues, and SVD.

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 DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Web Development**			**Module Delivery**	
Module Type	**Support**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**UOMAI204**				
ECTS Credits	**4**				
SWL (hr/sem)	**100**				
Module Level		UGI - 3	**Semester of Delivery**		Two (2)
Administering Department		Artificial Intelligence	**College**	**Computer Science and Mathematics**	
Module Leader	Dr. Alyaa Qusay Ahmed		**e-mail**	Dr.alyaa@uomosul.edu.iq	
Module Leader's Acad. Title			**Module Leader's Qualification**		Ph.D.
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name		Name	**e-mail**	E-mail	
Scientific Committee Approval Date		02/01 /2024	**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 Web Technologies: To provide students with a foundational understanding of web technologies, including HTML, CSS, and JavaScript, and their role in building websites and web applications. 2. Website Structure and Design: To teach students how to create well-structured and visually appealing websites using HTML and CSS, focusing on concepts such as layout, typography, color schemes, and responsive design. 3. Interactive Web Elements: To enable students to incorporate interactive elements into websites using JavaScript, 4. Client-Server Communication: To introduce students to the basics of client-server communication in web development, including sending and receiving data from a server using HTTP requests and APIs. 5. Web Accessibility: Apply principles of web accessibility, teach the student how design simple and efficient website, that allows users to quickly find the information they need, and looks visually pleasing. 6. Collaboration and Communication: To promote teamwork and effective communication skills by encouraging students to work collaboratively on group projects, 7. Problem-Solving and Debugging: To enhance students' problem-solving skills and teach them how to debug and troubleshoot common issues in web development.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Knowledge of Web Technologies: Gain a solid understanding of web technologies, including HTML, CSS, and JavaScript, and their role in web development. 2. Website Creation: Design and develop well-structured websites using HTML and CSS, considering factors such as layout, typography, color schemes, and responsive design. 3. Interactive Elements: Implement interactive features on websites using JavaScript, such as form validation, event handling, and dynamic content manipulation. 4. Client-Server Communication: Understand the basics of client-server communication in web development, including making HTTP requests and working with APIs to retrieve and send data. 5. Use of Web Development Tools: Utilize popular web development tools, such as text editors, version control systems, and debugging tools, to enhance productivity and efficiency in web development projects. 6. Project Development: Develop a complete web project, applying the knowledge and skills acquired throughout the course, from planning and design to implementation and deployment. 7. Collaboration and Communication: Collaborate with team members, for project requirements to design and implement websites efficiently.

Indicative Contents المحتويات الإرشادية	The indicative contents for Web Development 1 may include: 1. Introduction to Web Technologies: • Overview on internet, web development concepts and technologies • Understanding the client-server architecture and how the web works 2. HTML Fundamentals: • HTML syntax and structure • Working with tags, attributes, and elements • Creating hyperlinks, lists, tables, and forms 3. CSS Basics: • Introduction to Cascading Style Sheets (CSS) • Applying styles to HTML elements • Managing layout, typography, and colors 4. JavaScript Fundamentals: • Introduction to JavaScript programming language • Variables, data types, and operators • Conditional statements and loops 5. Responsive Web Design: • Designing websites that adapt to different screen sizes and devices • Implementing responsive layouts and navigation menus 6. Web Accessibility: • Understanding the importance of web accessibility and • Accessibility principles and techniques 7. Introduction to Server-side Technologies: • Overview of server-side programming languages and frameworks • Introduction to databases and server-side scripting 8. Introduction to Version Control: • Understanding the concept of version control and its importance in web development 9. Web Project Development: • Planning and organizing a web development project • Implementing the project using HTML, CSS, and JavaScript 10. Deployment and Maintenance:

	• Introduction to hosting a website on a server • Performing maintenance tasks and updates • Testing and troubleshooting common issues Please note that the above contents are indicative and may vary depending on the specific curriculum and institution offering the course

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1. Lectures: In-class lectures can be used to introduce and explain key concepts, programming languages, and techniques related to web development. The instructor can provide examples and demonstrations to illustrate the concepts. 2. Hands-on Practice: Students can engage in practical exercises and coding activities during the class or in dedicated lab sessions. T 3. Teach the student how to apply the knowledge gained and practice coding HTML, CSS, and JavaScript. 4. Project-based Learning: Assigning small projects or tasks related to web development can provide students with real-world scenarios to apply their skills and knowledge. 5. Group Discussions and Peer Learning: Encouraging group discussions and peer learning can enhance understanding and knowledge retention. Students can discuss challenges, exchange ideas, and collaborate on problem-solving. This fosters a collaborative learning environment and allows students to learn from each other's experiences. 6. Online Resources and Tutorials: Providing students with online resources, tutorials, and documentation can supplement classroom learning. These resources can include video tutorials, coding exercises, interactive websites, and documentation of programming languages and frameworks. 7. Code Reviews and Feedback: Conducting code reviews and providing feedback on student projects or assignments can help improve their coding skills. Feedback can be provided by the instructor or through peer code reviews. 8. Guest Speakers and Industry Insights: Inviting guest speakers from the industry or web development professionals to provide valuable insights and real-world experiences to students. They can share their expertise, industry trends, and challenges in web development, inspiring students and bridging the gap between academia and industry. 9. Assessment and Evaluation: Assessments can include quizzes, assignments, projects, and exams to evaluate students' understanding and progress. This allows the instructor to gauge their knowledge and provide constructive feedback for improvement. It is worth noting that the selection and implementation of these strategies may vary based on the specific educational institution, class size, resources available, and the preferences of the instructor.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	37	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
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	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	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 Internet, Web concept and Web Sites classifications
Week 2	Introduction to Web technologies, Web design Editors, HTML Basics (Elements, Attributes, Headings, Paragraphs, Styles)
Week 3	HTML formatting, HTML Tables, HTML Entities, Links, Images
Week 4	HTML Lists, HTML Internal Frames, HTML Media (video, audio),
Week 5	Creating stylish Websites HTML Layout, HTML Forms (form elements, Input types, Input attributes, files).
Week 6	Website Structure and Hosting
Week 7	Introduction to CSS Basics & Properties, Applying CSS styles to HTML elements
Week 8	Color System, Backgrounds, and Borders
Week 9	Fonts, Text in CSS, Links by CSS and Pseudo class

Week 10	Box Models (outlines, Padding, Margins), Dimensions, and Overflow
Week 11	Web application development process
Week 12	Introduction JavaScript Programming for web design and JavaScript frameworks
Week 13	JavaScript Programing, syntax, conditional statements and loops
Week 14	Programming Technologies Front-end framework and Back-end frameworks
Week 15	Programming using API and Creating and Testing Web Applications
Week 16	Final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Introduction to HTML, HTML editor and web design programing
Week 2	HTML Basics (Elements, Attributes, Headings, Paragraphs, and Styles).
Week 3	HTML formatting, HTML Tables. HTML Entities, Links, Images
Week4	HTML Lists, HTML Internal Frames, HTML Media (video, audio),
Week 5	Creating stylish Websites HTML Layout, HTML Forms (form elements, Input types, Input attributes, files).
Week 6	Introduction to CSS Basics & Properties
Week 7	CSS Syntax, Links by CSS , Links with HTML
Week 8	Color System, Backgrounds, and Borders, Fonts, Text in CSS.
Week 9	Design pages in CSS Box Models (outlines, Padding, Margins), Dimensions, and Overflow.
Week 10	Creating and styling navigation menus and Implementing CSS layouts and positioning
Week 11	Introduction to Bootstrap Framework Using Bootstrap CSS classes and components for rapid web development
Week 12	Introduction to Java Script, Document Object Model (DOM) Exploring the features and functionalities of JavaScript frameworks (e.g React)
Week 13	JavaScript Programing, syntax, conditional statements
Week 14	JavaScript variables, arithmetic operations, if condition, loops and Popup Boxes in JavaScript
Week 15	Design a complete website project including project testing, debugging, and evaluation
Week 16	Final Exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Learning Web Design: A Beginner's Guide to HTML, CSS, JavaScript, and Web Graphics, by Jennifer Robbins.	NO

Recommended Texts	"HTML &CSS" by "Thomas A. Powell "	NO
Websites	World Wide Web Consortium (W3C), http://www.w3c.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.