MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية			
Module Title	Computer Vision	**Module Delivery**	
Module Type	Core	☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	UoB12345		
ECTS Credits	6		
SWL (hr/sem)	77		
Module Level	4	**Semester of Delivery**	1
Administering Department	Type Dept. Code	**College**	Type College Code
Module Leader	Hikmat Z. Neima	**e-mail**	Hikmat.taher@uobasrah.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	15/06/2023	**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	Here are some module aims typically associated with a Computer Vision course. These aims describe the overarching goals and objectives of the course: 1. To provide students with a solid understanding of the fundamental concepts and principles of image processing. 2. To familiarize students with the methods that are deal with image processing. 3. To develop students' understanding of fundamentals of mathematics, enabling them to analyze images that are processed. 4. To give students an opportunity to strongly understand and apply the well-known image processing methods and algorithms. 5. To introduce students to the computer vision concepts. 6. To clarify the relationship between image processing and computer vision. 7. To introduces students to the fundamental concepts of computer vision providing an overview of the current methodologies and techniques. 8. To enable students exploring the theory behind fundamental processing tasks, including segmentation, feature extraction, image classification, and object detection, using a mathematical framework to analyze images as two-dimensional signals. This module aims to provide a broad overview of the goals and objectives of a Computer Vision course.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Here are some module learning outcomes that are typically associated with a Computer Vision course. These outcomes represent the knowledge, skills, and competencies that students are expected to achieve upon completing the course: 1. Understand the fundamental components and principles of image processing. 2. Understand the fundamental components and principles of computer vision. 3. By the end of this course, students will be able to apply the basic principles and tools used in image processing. 4. Students will be able to apply the basic principles and tools used in computer vision. 5. Students will be able to solve practical problems in scientific and commercial settings.
Indicative Contents المحتويات الإرشادية	

Learning and Teaching Strategies	
استراتيجيات التعلم والتعليم	
Strategies	When teaching a Computer Vision course to beginners, it's important to adopt strategies that cater to their foundational understanding and gradually build their

knowledge and skills. Here are some effective learning and teaching strategies for beginners in a Computer Organization & Architecture course:

1. Visual Aids and Analogies: Use visual aids such as diagrams, charts, and illustrations to simplify complex concepts. Analogies comparing computer components to familiar real-world objects can make abstract ideas more relatable and easier to understand.
2. Step-by-Step Approach: Break down complex topics into smaller, manageable steps. Present the material in a sequential manner, building upon previously covered concepts. This helps beginners grasp the fundamentals before moving on to more advanced topics.
3. Direct Activities: Provide firsthand activities that allow beginners to interact with hardware components or simulation software. This can include assembling simple computer systems, performing basic circuit simulations, or writing simple programs. Direct activities reinforce learning and make abstract concepts more tangible.
4. Practical Examples: Use practical examples and real-life scenarios to demonstrate the relevance and application of the concepts being taught. Relate the material to everyday situations or commonly used technologies to help beginners connect theory to practice.
5. Scaffolding: Provide scaffolding support by gradually reducing assistance as students gain confidence and proficiency. Start with guided exercises and gradually increase the level of complexity and autonomy. This helps beginners develop their critical thinking skills and independent thinking.
6. Interactive Discussions: Encourage interactive discussions to promote active engagement and peer learning. Beginners can ask questions, share their perspectives, and learn from their classmates' experiences. This fosters a supportive learning environment where beginners can build their understanding collaboratively.
7. Concept Mapping and Summarizing: Encourage beginners to create concept maps or summaries of the material covered. Concept maps visually organize the relationships between different concepts, while summaries help reinforce understanding and retention.
8. Concrete Examples: Use concrete examples and familiar scenarios to explain abstract concepts. Relate computer organization and architecture to everyday experiences, such as explaining how a CPU functions like the brain of a computer or how cache memory is like a high-speed storage closet.
9. Incremental Assessments: Break assessments into smaller, incremental tasks to evaluate and reinforce learning along the way. This can include quizzes, short assignments, or mini projects that gradually increase in complexity as beginners progress through the course.
10. Encourage Questions: Create a supportive environment that encourages beginners to ask questions without hesitation. Answer questions patiently and provide explanations in a clear and accessible manner. This helps beginners clarify their doubts and deepen their understanding.
11. Provide Additional Resources: Offer supplementary resources, such as textbooks, online tutorials, and reference materials, to support beginners' learning outside the classroom. These resources can provide alternative explanations, additional examples, and further practice opportunities.
12. Regular Feedback and Guidance: Provide timely and constructive feedback on assignments and assessments to guide beginners' progress. Highlight their

strengths and provide specific suggestions for improvement to help them grow and build confidence.

By employing these strategies, you can create an inclusive and supportive learning environment for beginners in a Computer Organization & Architecture course. Adjust the pace and depth of the course to accommodate their learning needs and gradually build their knowledge and skills in the subject.

Student Workload (SWL)
الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	45	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	80	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation
تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)
المنهاج الأسبوعي النظري

	Material Covered
Week 1	Introduction to Image Processing • Image Representation • Image Types
Week 2	Describe human color perception and representation.
Week 3	Color Models • RGB

	• HSV

Week 4	Basic Image Operations
	    • Point Operators
	    • Geometrical Operators

Week 5	Local Operators
	    • Linear Operators (convolutions)
	    • Morphological Operators (dilation and erosions)

Week 6	Binary Images • Geometric operations on binary images.
Week 7	Mid Term Exam

Week 8	Gray Scale Images
	    • Image Histogram
	    • Histogram Equalization
	    • Histogram Stretching

Week 9	• Edge Detection Algorithms.
	    • Sobol Operator
	    • Canny Operator

Week 10	• Image Segmentation Algorithms • Segmentation based on Histogram
Week 11	• Image Segmentation Algorithms • Segmentation based on clustering
Week 12	• Image Stitching Application • SIFT
Week 13	• Image Stitching Application • RANSAC

Week 14	• Motion
	    • Optic Flow
	    • Normalized Cross Correlation

Week 15	General Discussion
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus)
المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Introduction to Matlab
Week 2	Lab 2: Matlab environment overview
Week 3	Lab 3: Reading and writing an image
Week 4	Lab 4: Simple operations on images
Week 5	Lab 5: Image histogram
Week 6	Lab 6: Image histogram enhancement

Week 7	Lab 7: Edge Detection
Week 8	Lab 8: Edge Detection
Week 9	Lab 9: Lab Test
Week 10	Lab 10: Image Segmentation
Week 11	Lab 11: Image Segmentation
Week 12	Lab 12: Apply of SIFT
Week 13	Lab 13: Apply of SIFT
Week 14	Lab 14: Apply of optical flow
Week 15	Lab 15: General Review

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	**"Computer Organization and Architecture: Designing for Performance" by William Stallings:** ➤ This textbook provides a comprehensive introduction to computer organization and architecture, with a focus on performance design principles. It covers topics such as CPU organization, memory hierarchy, instruction set architecture, and I/O systems. The book includes numerous examples, illustrations, and exercises to reinforce concepts.	
Recommended Texts	**"Structured Computer Organization" by Andrew S. Tanenbaum and Todd Austin:** ➤ This book provides a structured approach to computer organization and architecture. It covers fundamental concepts, including digital logic, data representation, CPU organization, memory systems, and I/O systems. The text emphasizes the importance of hierarchical organization in computer systems and includes numerous examples and exercises to reinforce learning.	
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 (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	Cyber Security	**Module Delivery**
Module Type	Core	☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	UoB12345	
ECTS Credits	6	
SWL (hr/sem)	150	

Module Level	4	**Semester of Delivery**	1
Administering Department	Type Dept. Code	**College**	Type College Code
Module Leader	Name	**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	Name	**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	The exposure of the students to Cyber Security should lead to the following:- (a) Learn the foundations of Cyber security and threat landscape. (b) To equip students with the technical knowledge and skills needed to protect and defend against cyber threats. (c) To develop skills in students that can help them plan, implement, and monitor cyber security mechanisms to ensure the protection of information technology assets. (d) To expose students to governance, regulatory, legal, economic, environmental, social and ethical contexts of cyber security. (e) To expose students to responsible use of online social media networks. (f) To systematically educate the necessity to understand the impact of cyber crimes and threats with solutions in a global and societal context. (g) To select suitable ethical principles and commit to professional responsibilities and human values and contribute value and wealth for the benefit of the society.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Upon completion of the degree program, students will be able to:- (a) Understand the cyber security threat landscape. (b) Develop a deeper understanding and familiarity with various types of cyberattacks, cyber crimes, vulnerabilities and remedies thereto. (c) Analyse and evaluate existing legal framework and laws on cyber security. (d) Analyse and evaluate the digital payment system security and remedial measures against digital payment frauds. (e) Analyse and evaluate the importance of personal data its privacy and security. (f) Analyse and evaluate the security aspects of social media platforms and ethical aspects associated with use of social media. (g) Analyse and evaluate the cyber security risks. (h) Based on the Risk assessment, plan suitable security controls , audit and compliance. (i) Evaluate and communicate the human role in security systems with an emphasis on ethics, social engineering vulnerabilities and training.

	(j) Increase awareness about cyber-attack vectors and safety against cyber-frauds. (k) Take measures for self-cyber-protection as well as societal cyber-protection.
Indicative Contents المحتويات الإرشادية	• Introduction to Cyber security. • Cyber crime and Cyber law. • Social Media Overview and Security. • E - Commerce and Digital Payments. • Digital Devices Security , Tools and Technologies for Cyber Security.

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			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	77	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	73	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	
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	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
المنهاج الأسبوعي النظري	
	Material Covered
Week 1	Introduction to Cyber security.
Week 2	Defining Cyberspace and Overview of Computer and Web-technology, Architecture of cyberspace.
Week 3	Concept of cyber security.
Week 4	Cyber crime and Cyber law.
Week 5	Classification of cyber crimes, Common cyber crimes- cyber crime targeting computers and mobiles.
Week 6	Legal perspective of cyber crime.
Week 7	Mid-term Exam.
Week 8	Social Media Overview and Security.
Week 9	Types of Social media.
Week 10	Social media privacy, Challenges, opportunities and pitfalls in online social network.
Week 11	E - Commerce and Digital Payments.
Week 12	Main components of E-Commerce.
Week 13	Cyber Security best practices.
Week 14	Digital Devices Security , Tools and Technologies for Cyber Security.
Week 15	General Discussion.
Week 16	**Preparatory week before the final Exam.**

Delivery Plan (Weekly Lab. Syllabus)	
المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Implement Practical hands-on.
Week 2	Lab 2: Implement checklist for reporting cyber crime at Cyber crime Police Station.
Week 3	Lab 3: Implement checklist for reporting cyber crime online.
Week 4	Lab 4: Implement reporting phishing emails.
Week 5	Lab 5: Implement demonstration of email phishing attack and preventive measures.
Week 6	Lab 6: Implement basic checklist, privacy and security settings for popular Social media platforms.

Week 7	Lab 7: Implement reporting and redressal mechanism for violations and misuse of Social media platforms.

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	R. C Mishra, "Cyber Crime Impact in the New Millennium", Auther Press. Edition 2010.	No
Recommended Texts	Sumit Belapure, and Nina Godbole , "Cyber Security Understanding Cyber Crimes, Computer Forensics and Legal Perspectives", Wiley India Pvt. Ltd., First Edition, 2011.	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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MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information		
معلومات المادة الدراسية		
Module Title	**Operating Systems**	**Module Delivery**
Module Type	**Core**	☒Theory
Module Code	**CS401**	☒Lecture
ECTS Credits	**6**	☒Lab
SWL (hr/sem)	**150**	☐Tutorial ☐Practical ☐Seminar

Module Level	4	**Semester of Delivery**	8
Administering Department	Computer Science	**College**	Computer Science & Information Technology
Module Leader	Dr. Salah F. Saleh	**e-mail**	aldarraji@uobasrah.edu.iq
Module Leader's Acad. Title	Assistant Professor	**Module Leader's Qualification**	Ph.D.
Module Tutor		**e-mail**	
Peer Reviewer Name		**e-mail**	
Scientific Committee Approval Date	01/06/2023	**Version Number**	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	CS206	**Semester**	4
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 role and significance of operating systems in modern computer systems. 2. Comprehend the basic functionalities and components of operating systems. 3. Explore various operating system structures, designs, and implementation techniques. 4. Analyze the mechanisms for process management, including process creation, scheduling, synchronization, and communication. 5. Study memory management techniques, such as virtual memory, paging, and segmentation. 6. Investigate file systems and their organization, including file organization, access methods, and disk management. 7. Examine input/output (I/O) systems, device management, and the handling of interrupts. 8. Discuss the concepts of protection and security in operating systems. 9. Evaluate performance evaluation and tuning techniques for operating systems. 10. Explore emerging trends and advancements in operating systems, such as distributed systems, virtualization, and cloud computing.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Upon successful completion of the Operating Systems course, students should be able to: 1. Explain the key functions and significance of operating systems in modern computer systems. 2. Identify and describe the major types of operating systems, their characteristics, and their applications. 3. Understand the fundamental concepts and components of operating systems, including processes, threads, and scheduling algorithms. 4. Analyze and evaluate process management techniques, such as process creation, synchronization, and communication. 5. Demonstrate knowledge of memory management techniques, including virtual memory, paging, and segmentation. 6. Design and implement file systems, considering file organization, access methods, and disk management strategies. 7. Understand input/output systems, device management, and interrupt handling in operating systems. 8. Discuss the concepts of protection and security in operating systems, including access control and cryptography techniques. 9. Apply performance evaluation and tuning techniques to optimize the

	performance of operating systems.
	10. Explore and discuss emerging trends and advancements in operating systems, such as distributed systems, virtualization, and cloud computing.
	By achieving these learning outcomes, students will have a solid understanding of operating system principles, allowing them to effectively analyze, design, and implement operating systems and make informed decisions regarding their usage and configuration in various computing environments.

Indicative Contents
 	
المحتويات الإرشادية
	Here are some common topics that are typically covered in an Operating Systems course:
	
	1. Introduction to Operating Systems:
	   • Definition and goals of an operating system
	   • Evolution and historical perspective of operating systems
	   • Major types of operating systems (batch, time-sharing, real-time, distributed)
	   • Operating system services and functionalities
	
	2. Process Management:
	   • Process concept and process states
	   • Process scheduling algorithms (e.g., FCFS, SJF, Round Robin)
	   • Process synchronization and mutual exclusion
	   • Inter-process communication mechanisms
	   • Deadlock detection and prevention techniques
	
	3. Memory Management:
	   • Address spaces and memory partitioning
	   • Memory allocation strategies (e.g., contiguous allocation, paging, segmentation)
	   • Virtual memory concepts and techniques
	   • Page replacement algorithms (e.g., FIFO, LRU)
	   • Memory protection and sharing
	
	4. File Systems:
	   • File concept and file organization
	   • Directory structures and file operations
	   • File allocation methods (e.g., contiguous, linked, indexed)
	   • Disk scheduling algorithms (e.g., FCFS, SSTF, SCAN)
	   • File system implementation and maintenance
	
	5. Input/Output Systems:
	   • I/O devices and device drivers
	   • I/O operations and buffering
	   • Interrupt handling and interrupt-driven I/O

| | • Disk management and scheduling
• File system consistency and recovery

6. Process Communication and Synchronization:
    • Shared memory and message passing mechanisms
    • Semaphores, monitors, and locks for synchronization
    • Classical synchronization problems (e.g., producer-consumer, readers-writers)
    • Interprocess communication protocols and mechanisms

Protection and Security:

    • Access control and permissions
    • User authentication and authorization
    • Security threats and vulnerabilities
    • Cryptography and encryption techniques
    • Security mechanisms in operating systems |

| **Learning and Teaching Strategies** |
| استراتيجيات التعلم والتعليم |

| **Strategies** | In the context of the Operating Systems course, here are some strategies that can help students excel:

1. Active Participation: Actively engage in class discussions, ask questions, and contribute to group activities. This promotes a deeper understanding of the material and encourages critical thinking.

2. Take Detailed Notes: Take thorough and organized notes during lectures, ensuring you capture key concepts, definitions, and examples. Review and summarize your notes regularly to reinforce your understanding.

3. Practice Programming: Operating Systems often involve programming assignments. Dedicate time to practice programming concepts related to processes, memory management, file systems, and I/O operations. |

Experiment with sample code and work on programming projects to strengthen your skills.

4. Hands-on Labs: Make the most of the hands-on lab sessions provided in the course. These sessions offer an opportunity to apply theoretical knowledge and gain practical experience with operating system concepts. Complete lab exercises diligently and seek help from instructors or teaching assistants if needed.

5. Read the Recommended Textbooks: Consult the recommended textbooks and supplementary reading materials suggested by the course instructor. These resources provide additional explanations, examples, and insights into operating system concepts. Read actively, take notes, and reflect on the content.

6. Collaborate with Peers: Form study groups or join online discussion forums with classmates to discuss and review course materials. Collaborative learning can deepen your understanding by exposing you to different perspectives and approaches.

7. Review and Reinforce: Regularly review your notes, textbooks, and assignments to reinforce your understanding of operating system concepts. Look for connections between different topics and strive to develop a holistic understanding of how the various components of an operating system interact.

8. Seek Clarification: Do not hesitate to seek clarification from the instructor or teaching assistants if you have any doubts or questions. Clarifying misunderstandings early on can prevent confusion later and ensure a solid foundation for advanced topics.

9. Explore Real-world Examples: Supplement your learning by exploring real-world examples of operating systems and their applications. Investigate case studies, research papers, or industry articles to gain insight into practical implementations and emerging trends.

10. Practice Time Management: Plan your study time effectively to ensure you allocate sufficient time for reading, assignments, and exam preparation.

		Create a schedule and adhere to it, breaking down complex tasks into manageable segments.

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	77	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	73	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	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 Operating Systems • Definition, goals, and functions of an operating system • Evolution and historical perspectives of operating systems
Week 2	Introduction to Operating Systems • Major types of operating systems (e.g., batch, time-sharing, real-time, distributed)
Week 3	Process Management • Process concept and process states • Process scheduling algorithms
Week 4	Process synchronization and inter-process communication
Week 5	Deadlock detection and prevention
Week 6	Memory Management
Week 7	**Mid-term Exam**
Week 8	Virtual memory and paging techniques
Week 9	Memory segmentation and protection
Week 10	File Systems • File concept and file organization • Directory structures and file access methods
Week 11	File Systems • Disk management and file allocation strategies
Week 12	Input/Output Systems
Week 13	Protection and Security
Week 14	Performance Evaluation and Tuning
Week 15	Emerging Trends in Operating Systems
Week 16	**Preparatory week before the final Exam**

	Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر
	Material Covered
Week 1	Lab 1: Introduction to Operating System Environment • Setting up the development environment (e.g., virtual machines, emulators) • Familiarization with command-line interfaces and basic shell commands • Exploring system utilities and tools for system monitoring and troubleshooting
Week 2	Lab 2: Process Management • Implementing process creation and termination routines • Designing and implementing process scheduling algorithms (e.g., Round Robin, Priority Scheduling) • Simulating and analyzing the behavior of different scheduling algorithms • Implementing inter-process communication mechanisms (e.g., shared memory, message passing)
Week 3	Lab 3: Memory Management • Implementing memory allocation algorithms (e.g., First Fit, Best Fit, Buddy System) • Simulating and analyzing the behavior of different memory allocation algorithms • Implementing virtual memory techniques (e.g., page tables, demand paging) • Evaluating the performance impact of different page replacement algorithms
Week 4	Lab 4: File System Implementation • Designing and implementing basic file operations (e.g., create, delete, read, write) • Implementing file allocation methods (e.g., contiguous, linked, indexed) • Simulating and evaluating the performance of different file allocation methods • Implementing directory structures and file access control mechanisms
Week 5	Lab 5: I/O System and Device Management • Implementing device driver routines for I/O devices • Handling interrupts and implementing interrupt-driven I/O • Analyzing and optimizing disk scheduling algorithms

	• Simulating and benchmarking I/O performance for different devices and workloads
Week 6	Lab 6: Process Synchronization and Deadlock Avoidance • Implementing synchronization primitives (e.g., semaphores, monitors, locks) • Solving classical synchronization problems (e.g., producer-consumer, readers-writers) • Analyzing and detecting deadlock scenarios • Implementing deadlock avoidance techniques (e.g., resource allocation graphs)
Week 7	**Mid-term Exam**
Week 8	Lab 7: Protection and Security Mechanisms • Implementing access control mechanisms (e.g., permissions, access control lists) • Designing and implementing user authentication and authorization routines • Exploring cryptographic algorithms and implementing encryption techniques • Analyzing and mitigating common security threats in an operating system
Week 9	Lab 8: Performance Analysis and Optimization • Profiling and monitoring system performance using performance measurement tools • Analyzing and optimizing CPU scheduling policies • Evaluating and optimizing I/O performance • Analyzing system resource utilization and identifying performance bottlenecks
Week 10	Lab 9: Distributed Systems and Virtualization • Setting up a simple distributed system environment • Implementing remote procedure calls (RPC) or message passing between distributed processes • Exploring virtualization technologies and setting up virtual machines • Experimenting with containerization technologies (e.g., Docker)
Week 11	Lab 10: Case Study and Project • Analyzing and discussing case studies of real-world operating systems • Working on a project that involves implementing an operating system component or exploring an emerging operating system topic • Presenting and demonstrating the project to the class

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	"Operating System Concepts" by Abraham Silberschatz, Peter B. Galvin, and Greg Gagne. This widely used textbook provides a comprehensive introduction to operating systems, covering the fundamental concepts, principles, and implementation details.	Yes
Recommended Texts	1. "Modern Operating Systems" by Andrew S. Tanenbaum and Herbert Bos. 2. This book offers a thorough examination of modern operating system design and implementation, including topics such as process management, memory management, file systems, and security. 3. "Operating Systems: Internals and Design Principles" by William Stallings. 4. This textbook provides an in-depth exploration of operating system internals, focusing on design principles, algorithms, and system components. It covers topics such as process management, memory management, file systems, and distributed systems.	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 (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	Information Security		**Module Delivery**	
Module Type	Core		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	UoB12345			
ECTS Credits	6			
SWL (hr/sem)	150			
Module Level	4	**Semester of Delivery**	1	
Administering Department	Type Dept. Code	**College**	Type College Code	
Module Leader	Name	**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	Name	**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	This course provides students with the most common cryptographic algorithms and protocols and how to use cryptographic algorithms and protocols to secure distributed applications and computer networks: • Explain the objectives of information security. • Explain the importance and application of each of confidentiality, integrity, authentication and availability. • Understand various cryptographic algorithms. • Understand the basic categories of threats to computers and networks.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	By the end of the course, students will be able to: • Understand the Cryptography principles and types. • Describe the computer systems security issues. • Student will be able to understand basic cryptographic algorithms, message and security issues. • Ability to identify information system requirements for both of them, such as, client and server. • Ability to understand the current issues towards information security. • Apply security principles to system design.

Indicative Contents المحتويات الإرشادية	• Introduction.
	• Basic Concepts and Terminology.
	• Classical Encryption Techniques.
	• Symmetric Cipher Model.
	  - Substitution Techniques.
	  - Transposition Techniques.
	• Block Ciphers and the Data Encryption Standard.

	- Block Cipher Principles. - Differential and Linear Cryptanalysis. - Block Cipher Modes of Operation. • Advanced Encryption Standard. • Stream Cipher.

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

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	62	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	88	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	
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	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
المنهاج الأسبوعي النظري	
	Material Covered
Week 1	Introduction.
Week 2	Model for Network Security.
Week 3	Classical Substitution Ciphers.
Week 4	Language Redundancy and Cryptanalysis.
Week 5	Vigener Cipher.
Week 6	Transposition Ciphers.
Week 7	Mid-term Exam.
Week 8	Block Ciphers and the Data Encryption Standard.
Week 9	Data Encryption Standard.
Week 10	Avalanche Effect.
Week 11	Modes of Operation: CTR.
Week 12	Rijndael Cipher.
Week 13	AES Key Expansion.
Week 14	Stream Cipher.
Week 15	General Discussion
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus)	
المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Implement Ceaser Cipher.
Week 2	Lab 2: Implement Vigenere Cipher.
Week 3	Lab 3: Implement Enigma Cipher.
Week 4	Lab 4: Implement DES Cipher.
Week 5	Lab 5: Implement AES Cipher.
Week 6	Lab 6: Implement Stream Cipher.
Week 7	Lab 7: Implement Statistical Tests.

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	William Stallings, "Cryptography and Network Security. Principle and Practice", Fourth Edition, Principle Hall, USA, 2006.	No
Recommended Texts	Alfred J. Menezes, Paul C. van Oorschot and Scott A. Vanstone, "Handbook of Applied Cryptography", Fifth Edition , CRC Press, 2001.	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

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MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information

Module Title	**Selected Topics in Computer Science**	Module Delivery	
Module Type	Core	☒Theory	
Module Code	**UoB12345**	☒Lecture	
ECTS Credits	**6**	☐Lab	
		☐Tutorial	
SWL (hr/sem)	**150**	☐Practical	
		☒Seminar	
Module Level	4	Semester of Delivery	2
Administering Department	Computer Science	College	Computer Science & Information Technology
Module Leader	MOHAMED ABDULRAHMAN ABDULHAMID	e-mail	Mohammed@uobasrah.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	M.S.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	18/06/2023	Version Number	1.0

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	Computer Thinking for Problem Solving	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. Getting students ready to keep up with new developments in computer science. 2. Students gain practical experience with several modern Topic(s) such as (Bigdata,Data Science, Machine learning and so on) 3. Getting an integrated plan to delve deeper into these topics and what is the road map to access them. 4. Educating students to better compete in the job market. 5. This is the basic subject for all Topic(s).
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Refresh students' knowledge of their field of study. 2. List the various terms associated with Topic(s). 3. Summarize what is meant by a basic Topic(s). 4. Discuss the reaction and involvement of Topic(s). 5. Introducing the student to the road map for the Topic(s) and what steps need to be followed.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Part A - Computing Theory Computer Generations – A timeline of the evolution of computer generations. Introduce the student to the future direction of computing, for example using a Quantum computer. [9 hrs] Computer science specializations – This includes the newest developments in computer science, such as new and future disciplines, frameworks, and modern programming languages. [9 hrs] Preparing and presenting the academic report - Preparing the student to understand the basics of writing and presenting the academic report in a clear and concise manner. [6 hrs] Problem Solving - Identify the most important steps to solving software problems. Provide some examples of this in practice as well. [15 hrs] Part B - Advanced Topics in Computer Science Fundamentals Distributed Systems, Parallel computing, Cloud computing and 5G and 4G technologies. Where these technologies are seen as the most important parts of the modern generation's growing technological progress. [18 hrs]

	Topic(s) in Computer Science – Machine Learning Approaches, Deep Learning Approaches, Big data, Data Science, wireless sensor network. [18 hrs]	

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

Strategies	The main strategy that will be for this rich course will teach students the latest and most important developments in computer science. Which helps prepare computer science graduates capable of adapting to the job market. Also, by teaching students to write reports and make simple presentations while improving their critical thinking skills and effective ways to solve programming problems. In addition, interactive classrooms and tutorials will help students design simple experiments for the sampling activities they need. It must be mentioned that this course will be changing according to the department's directions to change topics in the field of computer science.

Student Workload (SWL)
الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	75	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	6
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	75	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, 7 and 13

	Seminar	1	10% (10)	9	LO # 3, 4, 5, 6, 7 and 13
	Report	1	10% (10)	13	LO # 6, 8,10 and 14
Summative assessment	Midterm Exam	2 hr	10% (10)	12	LO # 1-12
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction - Familiarize students with the course and directions of the course
Week 2	Introduction For Generations oF Computer And beyond that
Week 3	Computing and Knowledge area of computer science
Week 4	Introduction for Problem Solving Using Computer (Referesh)
Week 5	Problem Analysis and Program Design Steps
Week 6	Practical examples by Problem Solving Steps
Week 7	Fundamentals of research methodology - Writing an effective academic report
Week 8	Fundamentals of research methodology - Make an effective presentation
Week 9	Seminar of students (Various topics in computer science)
Week 10	Fundamentals of Distributed Systems, Parallel computing.
Week 11	Basic of 5G and 4G technologies
Week 12	Mid Exam
Week 13	Introduction to Machine learning (ML) and Deep Learning (DL).
Week 14	Big Data Concept (Nominate a topic)
Week 15	Dealing with big data
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?

Required Texts	[1] Everything You Need to Ace Computer Science and Coding in One Big Fat Notebook: The Complete Middle School Study Guide (Big Fat Notebooks). Workman Publishing Company, 2020.	No
Recommended Texts	[2] Nielsen, M. A. (2015). Neural networks and deep learning (Vol. 25). San Francisco, CA, USA: Determination press. [3] Dietrich, D., Heller, B., & Yang, B. (2015). Data science & big data analytics: discovering, analyzing, visualizing and presenting data. Wiley.	No
Websites	https://www.coursera.org/learn/cs-algorithms-theory-machines	

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	**Cloud Computing**	Module Delivery
Module Type	Core	☒Theory
Module Code	**UoB12345**	☒Lecture
ECTS Credits	6	☒Lab
SWL (hr/sem)	**150**	☐Tutorial
		☐Practical
		☐Seminar

Module Level	4	Semester of Delivery	1
Administering Department	CS	College	CSIS
Module Leader	ALI SALAH	e-mail	ali_s.hashim@uobasrah.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	M.Sc
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	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. Understand what cloud computing is and why it is important. 2. Get a picture of the economics of cloud computing. 3. Learn about many fundamental technologies that enable cloud computing, such as software defined architectures, virtualization, and containers.

	4. Learn about the different levels of clouds services, which include IaaS (Infrastructure as a Service), PaaS (Platform as a Service), SaaS (Software as a Service), MaaS (Metal as a Service), FaaS (Function as a Service (server-less architecture)). 5. Compare the advantages and disadvantages of various cloud computing platforms. 6. Analyze the performance, scalability, and availability of the underlying cloud technologies and software
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Analyze the trade-offs between deploying applications in the cloud and over the local infrastructure. 2. Compare the advantages and disadvantages of various cloud computing platforms. 3. Deploy applications over commercial cloud computing infrastructures such as Amazon Web Services, Windows Azure, and Google AppEngine. 4. Program data intensive parallel applications in the cloud. 5. Analyze the performance, scalability, and availability of the underlying cloud technologies and software. 6. Identify security and privacy issues in cloud computing. 7. Explain recent research results in cloud computing and identify their pros and cons. 8. Solve a real-world problem using cloud computing through group collaboration.

Indicative Contents
 	
 المحتويات الإرشادية
	Indicative content includes the following:
	
	 • Introduction to Cloud Computing:
	     • Defining Cloud Computing.
	     • Exploring the roots of Cloud Computing. (2 hours)
	 • Cloud Computing Deployment Models:
	     • Overview of different deployment models such as public, private, hybrid, and community clouds. (2 hours)
	 • Cloud Service Models:
	     • Understanding Infrastructure as a Service (IaaS), Platform as a Service (PaaS), and Software as a Service (SaaS). (2 hours)
	 • Characteristics of Cloud Computing:
	     • Examining the characteristics and key features of Cloud Computing.
	     • Analyzing the advantages and disadvantages of adopting Cloud Computing. (4 hours)
	 • Cloud Computing Architecture Layers:
	     • Exploring the different layers of Cloud Computing architecture, including infrastructure, platform, and software layers.
	     • Understanding the interactions and dependencies between these layers. (3 hours)
	 • Cloud Computing Methodologies:
	     • Overview of methodologies and best practices for implementing and managing Cloud Computing solutions. (2 hours)
	 • Cloud Application Architecture:
	     • Understanding the design principles and components of Cloud application architecture.
	     • Exploring scalable and resilient application architectures. (3 hours)
	 • Virtualization Concepts:
	     • Introduction to virtualization technologies and their role in Cloud Computing.
	     • Understanding virtual machines, hypervisors, and containerization. (3 hours)
	 • Moving Applications into the Cloud:
	     • Strategies and considerations for migrating applications to the Cloud.
	     • Exploring tools and techniques for seamless application migration. (3 hours)

- Security in Cloud Computing: - Understanding the security challenges and measures in Cloud Computing.   - Exploring authentication, access control, data protection, and compliance in the Cloud. (4 hours)   - Basics of Cloud Management: - Overview of Cloud management techniques and tools.   - Understanding resource provisioning, monitoring, and optimization in the Cloud. (3 hours)   - Cloud Migration: - Exploring the process and challenges of migrating systems and data to the Cloud.   - Understanding the importance of planning, testing, and executing a successful migration. (3 hours)   - Daily Life Cloud Applications: - Examining practical applications of Cloud Computing in everyday life.   - Understanding how Cloud services impact various industries and sectors. (2 hours)   - Examples of Cloud Computing Applications: - Studying prominent examples of Cloud Computing applications such as Google, Azure platform, and Amazon Web Services.   - Exploring other Cloud-based applications found on the Internet, such as Force.com, SoundCloud, HyperOffice, and MyMusicCloud. (3 hours)

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)	109	Structured SWL (h/w)	7

الحمل الدراسي المنتظم للطالب خلال الفصل		الحمل الدراسي المنتظم للطالب أسبوعيا	
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	91	**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**	1	10% (10)	5 and 10	LO #1, #2 and #10, #11
	Assignments	2	20% (20)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	0	0% (0)		
	Report	0	0% (0)		
Summative assessment	**Midterm Exam**	2hr	20% (20)	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 Cloud Computing.
Week 2	Defining the Cloud Computing, the roots of Cloud Computing
Week 3	Cloud Computing Deployment models, Cloud service models (IaaS, PaaS, SaaS).

Week 4	Characteristics of Cloud Computing/ advantages and disadvantages of adopting Cloud Computing
Week 5	Cloud Computing Architecture layers, Cloud Computing methodologies.
Week 6	Cloud application architecture
Week 7	Virtualization Concepts
Week 8	How to move application into the cloud
Week 9	Security in Cloud Computing.
Week 10	Basics of Cloud Management
Week 11	Cloud Migration
Week 12	Daily life Cloud's Application
Week 13	Examples of Cloud Computing applications: Google, Azure platform, Amazon Web Services. Other examples on the Internet such as Force.com, SoundCloud, HyperOffice, MyMusicCloud
Week 14	Collaborating using Google Cloud
Week 15	Disaster Recovery
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Surianarayanan, C., & Chelliah, P. R. (2019). Essentials of Cloud Computing.	No
Recommended Texts	L. Wang, R. Ranjan, J. Chen, and B. Benatallah, *Cloud Computing: Methodology, Systems, and Applications*, CRC Press, Boca Raton, FL,USA, ISBN: 9781439856413, October 2021.	No
Websites	Technical papers from major journals and major conferences on computing, networking, cloud computing	

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
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	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
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