Course Syllabus/Specification

Course Specification

Cloud computing is revolutionizing the way we store, process, and access data. Instead of relying on local servers or personal computers, cloud computing allows you to use a network of remote servers hosted on the internet to manage data. Course introduces students to the fundamentals of cloud computing, provides hands-on experience in using cloud services and platforms and familiarizes students with the architecture and components of cloud systems.

1. Teaching Institution	**University of Al-Mustaqbal** **college of Science**
2. Department / Center	**Intelligent Medical Systems Department**
3. Course Title /Code	Cloud Computing **MU03024101**
4. Modes of Attendance Offered	Direct
5. Semester/Year	1 / 2025 - 2026
6. Number of Hours Tuition (Total)	60 Hour
7. Date of Production of this Specification	1/9/2025
8. Course Description	This course can be the definitive resource for persons working in this field as researchers, scientists, programmers, engineers, and users. The course is intended for a wide variety of people including academicians, designers, developers, educators, engineers, practitioners, researchers, and graduate students. With the dramatic growth of cloud computing technologies, platforms, and services.
9. Aims of the Course • The student should be able to understand the basics of Cloud technology • The student should be able to manage cloud computing concepts. • The student should be able to understand the Grid Computing vs Cloud Computing. • The student should be able to create and deal with virtual machines. • The student should be able to create containers and deal with them. • The student should be able to understand the steps of creating privet cloud environment.	

10. Learning Outcomes, Teaching, Learning and Assessment Methods

A. Knowledge and Understanding

1. An ability to understand the basics of Cloud technology.
2. understand the steps of creating privet cloud environment

Teaching and Learning Methods (Select from No. 17)

1. E-Learning
2. Self-Learning
3. Learning by Experimentation

B. Subject-Specific Skills.

1. An understanding of processes that support the delivery and management of information systems within a specific application environment

Teaching and Learning Methods (Select from No. 17)

1. E-Learning
2. Cooperative Learning

Assessment Methods (Select from No. 18)

1. Collective Project

C. Critical Thinking Skills

1. An ability to function effectively on teams to accomplish a common goal
2. An ability to communicate effectively with a range of audiences

Teaching and Learning Methods (Select from No. 17)

1. Collective Project
2. Learning by Experimentation
3. Indirect Learning

Assessment Methods (Select from No. 18)

1. Students Performance Assessment

D. General and Transferable Skills. (Select from No. 16)

1. Ability to communicate effectively with colleagues in work environment.
2. Ability to solve problems

Teaching and Learning Methods (Select from No. 17)

1. E-Learning
2. Self-Learning
3. Learning by Experimentation

Assessment Methods (Select from No. 18)

1. Collective Project
2. Standard test

11. Course Structures

Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	2 + 2	Introduction	1- History of the Cloud 2- The Cloud in numbers 3- Types of Cloud Services 4- Cloud Problem 5- Why Cloud	direct	direct questions
2	2 + 2	Anatomy of the cloud network	1. Connect to Cloud 2. Network Architectures for Clouds 3. A data center network 4. Data center interconnect network 5. Public Internet 6. Data Center Interconnect Network	direct	direct questions

			7. Network Architecture for Hybrid Cloud Deployments		
3	2 + 2	The Role of Grid Computing Technologies in Cloud Computing	1. Basics of Grid Computing 2. Basics of Cloud Computing 3. Layered Models and Usage patterns in Grid and Cloud 4. Platform - Abstraction from Physical Resources	direct	direct questions
4	2 + 2	The Role of Grid Computing Technologies in Cloud Computing 2	1. Service Orientation and Web Services 2. Data Management 3. Monitoring 4. Autonomic Computing 5. Security and User Management 6. Modeling and Simulation of Clouds and Grids	direct	direct questions
5	2 + 2	Cloud Computing Versus Cloud Services	1. The key attributes of cloud computing 2. Infrastructure systems 3. Application software 4. Application development and deployment software 5. System and application management software 6. IP networks	direct	direct questions
6		First Midterm			
7	2 + 2	What is Virtualization	1. What Virtualization can. 2. WHY VIRTUALIZE 3. RESOURCE OPTIMIZATION 4. Partitioning 5. Portability 6. Security 7. Agnostic	direct	direct questions
8	2 + 2	What is Virtualization 2	1. Enter virtualization 2. Virtual Machines	direct	direct questions

			3. What is a hypervisor 4. Types of Virtualization		
9	2 + 2	What is Virtualization 3	1. Server Virtualization 2. Network Virtualization 3. Desktop Virtualization 4. benefits of virtualization	direct	direct questions
10	2 + 2	What is a Container?	5. What is a container? 6. Headings 7. Why are containers used? 8. Containers vs. VMs 9. Benefits of containers	direct	direct questions
11	2 + 2	What is a Cluster? An Overview of Clustering in the Cloud ?	1. How Digital Images Work 2. Types of Cluster Computing 3. Benefits of Cluster Computing 4. Clustering Challenges 5. Clusters in the Cloud 6. Kubernetes	direct	direct questions
12		Second Midterm			
13	2 + 2	A Cloud Computing Based Patient Centric Medical Information System	1. Potential Impact of Proposed Medical Informatics System 2. A Service Oriented Architecture for Interfacing Medical Messages 3. Lossless Accelerated Presentation Layer for Viewing DICOM Objects on Cloud	direct	direct questions
14	2 + 2	A Cloud Computing Based Patient Centric Medical Information System 2	1. Web Based Interface for Patient Health Records 2. A Globally Distributed Dynamically Scalable Cloud Based Application Architecture 3. Distributed Data Consistency Across Clouds 4. Higher availability and application scalability	direct	direct questions

15	2 + 2	Projects	Seminars and discussion	direct	

12. Infrastructure	
I. Textbooks:	
II. References:	Handbook of Cloud Computing By Borko Furht · Armando Escalante
III. Recommended reading: (Periodicals, Reports, …)	
IV. E-References, Websites, ….	Zen of Cloud_ Learning Cloud Computing by Examples Ed 2. The Complete Cloud Computing Manual - 5th Edition 2020 **PDF**

13. Assessments:		Type of Assessment Description											
	Weighting	Theory						Practical					
Course Work	Total	T.1	T.2		Assig.		Atten	T.1	T.2	Proj			Atten
	50	10	10		5		5	5	5	5			5
Final	Total	Theory						Practical					
	50	30						20					
Total	100												

14. Course Development Plan
• Setup a privet cloud environment. • Update the lectures by new references.

15. ABET/CAC											
	Student Outcome	Course Objectives									
a	An ability to apply knowledge of computing and mathematics appropriate to the program's student outcomes and to the discipline	I	II	III	IV	V					
b	An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution										

c	An ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs										
d	An ability to function effectively on teams to accomplish a common goal										
e	An understanding of professional, ethical, legal, security and social issues and responsibilities										
f	An ability to communicate effectively with a range of audiences										
g	An ability to analyze the local and global impact of computing on individuals, organizations, and society										
h	Recognition of the need for and an ability to engage in continuing professional development										
i	An ability to use current techniques, skills, and tools necessary for computing practice										
Computer Science (CS) For CS Add (j &k) to (a – i)											
	Computer Science (CS)										
j	An ability to apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices										
k	An ability to apply design and development principles in the construction of software systems of varying complexity										
Information systems (IS) For IS Add (j) to (a – i)											
	Information systems (IS)										
j	An understanding of processes that support the delivery and management of information systems within a specific application environment										
Information Technology (IT) For IT Add (j,k,l,m,n) to (a –i)											
	Information Technology (IT)										
j	An ability to use and apply current technical concepts and practices in the core information technologies										
k	An ability to identify and analyze user needs and take them into account in the selection, creation, evaluation and administration of computer-based systems										
l	An ability to effectively integrate IT-based solutions into the user environment										
m	An understanding of best practices and standards and their application										

n	An ability to assist in the creation of an effective project plan										
(IB) Information Business Add fields according to IB											
	Information Business (IB)										
o	An ability to apply total quality management for it system and to develop the software.										
p	An ability to analyze quantitative models for business in a long term plan (strategy) in dynamic business.										
q	An ability to apply E-process for organization.										

16. General and Transferable Skills
a. Ability to adopt lifelong learning.
b. Ability to communicate information with other specialization.
c. Ability to solve problems.
d. Ability to communicate effectively with colleagues in work environment.

17. Teaching and Learning Methods
a. E-Learning
b. Self-Learning
c. Learning by Experimentation
d. Cooperative Learning
e. Brainstorming
f. Indirect Learning

18. Assessment Methods
a. Achievement Tests
b. Standard Tests
c. Individual Skills Assessment
d. Selection of Intellectual Question in Achievement tests
e. Collage Peer Assessment
f. Collective Project
g. Project consist of Random groups of Students
h. Students Performance Assessment
i. Experience and Professionalism Assessment