



جمهورية مصر العربية

وزارة التعليم العالي والبحث العلمي

Ministry of Higher Education and Scientific Research



المعهد العالى للحاسبات وتكنولوجيا المعلومات  
مدينة الشروق - القاهرة  
شعبة علوم الحاسب

## Course specification

**Course Code:** CS 433

**Course Title:** Cloud Computing

**Academic Year:** 2023/2024

**Course specification**  
**(CS 433 - Cloud Computing)**

Course Outline	
<b>Faculty:</b>	<i>HICIT- (Higher Institute for Computers &amp; Information Technology-El Shorouk Academy)</i>
<b>Programme(s) on which the course is given:</b>	Undergraduate program in Computer Science
<b>Major or minor element of programme:</b>	Compulsory
<b>Department offering the program</b>	Department of Computer Science
<b>Department offering the course:</b>	Department of Computer Science
<b>Level</b>	Fourth Level
<b>Date of specification approval</b>	DD/MM/2023

Basic Information			
<b>Code:</b>	CS 433	<b>Title:</b>	<b>Cloud Computing</b>
<b>Prerequisites:</b>	CS 250 Computer Networks		
<b>Weekly Hours:</b>			
<b>Lecture: 2</b>	<b>Exercise: -</b>	<b>Practical : 2</b>	<b>Total: 3 credit hours</b>

Professional Information
<b><u>Course Aims:</u></b>
This course introduces the techniques underlying the design and engineering of distributed systems and cloud computing systems. Topics include cloud and distributed system models, computer clusters, virtualization, cloud storage and data centers, cloud-enabling technologies, cloud mechanisms, and cloud architectures. Students will also acquire hands on experience in cloud programming and software.

Program ILOs Covered by Course			
Knowledge and understanding	Intellectual Skills	Professional and practical skills	General and Transferable skills
A3,A9,A10,A15,A19	B1, B2	C1	D1

## Intended learning outcomes of course (ILOs)

**a. Knowledge and Under-Standing:**

- a1** - Describe system models for distributed and cloud computing.
- a2** - Understand the design principles of computer clusters and data centers.
- a3** - Describe and distinguish different virtualization techniques.
- a4** - Explain cloud-enabling technologies, cloud mechanisms, and cloud architectures.

**b. Intellectual Skills:**

- b1** - Use cloud computing software to solve real problems.

**c. Professional and practical skills**

- c1** - Use cloud computing software to solve real problems.

**d. General and transferable skills**

- d1** - Solve problems and exhibit self-learning abilities in distributed and cloud computing.

## Contents

Topic	Contact Hours	
	lecture	Lab
Concepts and Models of Distributed System and Cloud Computing (Basic Concepts and Terminology, System Models for Distributed System and Cloud Computing[SaaS / PaaS / IaaS, Public / Private/ Hybrid Cloud])	2	2
Concepts and Models of Distributed System and Cloud Computing (Concurrency in the Cloud, Speedup and Load Balancing)	2	2
Computer Clusters for Scalable Computing (Clustering for Massive Parallelism, Computer Clusters and MPP Architectures)	2	2
Computer Clusters for Scalable Computing (Design Principles of Computer Clusters, Cluster Job and Resource Management)	2	2
Cloud-Enabling Technologies (Networking Technology for Cloud Computing, Storage Technology for Cloud Computing)	2	2
Cloud-Enabling Technologies (Big Data and Data Streaming, Storage Technology Case Studies [e.g. Google File System, NoSQL])	2	2
Virtual Machines and Virtualization (Levels of Virtualization, Virtual Machine)	2	2
Virtual Machines and Virtualization (Containers and Orchestration, Case Studies [e.g. Hyper-V, Docker, Kubernetes])	2	2
Cloud Computing Mechanisms and Architectures (Specialized Cloud Mechanisms, Cloud Management Mechanisms)	2	2
Cloud Computing Mechanisms and Architectures (Cloud Security Mechanisms for Private and Public cloud, Cloud Computing Architectures)	2	2
Cloud Programming and Software (Basic Programming in Distributed Environments, Services and Service Oriented Architecture)	2	2
Cloud Programming and Software (Case Studies [e.g., Google App Engine, Amazon Web Services], Setting up and Administering Cloud Computing Software for Problem Solving)	2	2

Teaching and learning methods	
Teaching and learning methods	Used
Lectures	√
Tutorial Exercises	
Practical Lab	√
Discussions.	√
Self – Learning (Reading material, Websites search,)	
Self-studies	
Group work	
Presentation	
Problem solving/problem solving learning based	
Case study	
Synchronous E-Learning	
Video lectures	
Asynchronous E-Learning	

Student assessment methods & Schedule		
Methods	Used	Week#
Midterm Exam	√	8
Final Exam	√	16
Course Work & Quizzes	√	2-14

Assessment Weight	
Assessment	Weight %
Mid Term Exam	20%
Final Exam	60%
Course Work & Quizzes	20%
Total	100

Course Work & Quizzes
Short Exams, Assignments, Research, Reports, Presentations
Class/Project discussion

List of references	
<b>Essential books (textbooks)</b>	<ul style="list-style-type: none"> <li>▪ Dan C. Marinescu, Cloud Computing: Theory and Practice, 2nd Edition, Morgan Kaufmann, 2017</li> <li>▪ Kai Hwang, Jack Dongarra, and Geoffrey C. Fox, Distributed and Cloud Computing: From Parallel Processing to the Internet of Things, 1st Edition, Morgan Kaufmann, 2011.</li> </ul>
<b>Course notes</b>	E-Learning Portal
<b>Recommended books</b>	
<b>Periodicals, website</b>	
<b>Videos link</b>	

### Required Facilities

<b>Tools &amp; SW (Technology facilities):</b>	<ul style="list-style-type: none"> <li>- Amazon AWS platform, products, and services</li> <li>- Microsoft TEAMS to create virtual classrooms for lectures, discussions for project.</li> <li>- Academy Portal (MOODLE) to make electronic quizzes and electronic midterm exam.</li> <li>- Academy Portal (MOODLE) to upload project deliverable and assignment.</li> <li>- Academy portal (MOODLE) to upload electronic material.</li> </ul>	
<b>Teaching facilities:</b>	<b>Whiteboard</b>	√
	<b>Computer Lab</b>	√
	<b>Data show</b>	√
	<b>E-Learning</b>	√
	<b>Videos</b>	√
	<b>Website</b>	√

### Course Content/ILO Matrix

Course Contents	Knowledge & understanding				Intellectual skills		Professional and practical skills	General
	a1	a2	a3	a4	b1	b2	c1	d1
Concepts and Models of Distributed System and Cloud Computing	x	x		x				
Computer Clusters for Scalable Computing		x						
Cloud-Enabling Technologies		x		x				
Virtual Machines and Virtualization			x		x			
Cloud Computing Mechanisms and Architectures			x	x				
Cloud Programming and Software					x	x		x

Learning Method /ILOs Matrix								
Learning Methods	Knowledge and understanding				Intellectual skills		Professional and practical skills	General
	a1	a2	a3	a4	b1	b2	c1	d1
Lectures	x	x	x	x				
Tutorial Exercises	x	x	x	x				
Reading material							x	x
Websites search								
Research and reporting								
Problem solving								
Group work								
Case study								
Practical Lab								
Discussions.							x	x

Assessment Methods /ILOs Matrix								
Assessment Methods	Knowledge & understanding				Intellectual skills		Professional & practical skills	General
	a1	a2	a3	a4	b1	b2	c1	d1
Mid Term Exam	x	x	x	x	x	x		
Final Exam	x	x	x	x				
Course Project								
Course Work & Quizzes	x	x	x	x	x	x		
Practical Exam	x	x	x	x	x	x		

Course ILOs Vs. Program ILOs										
Course ILOs \ Prog ILOs		Knowledge & understanding					Intellectual skills		Professional and practical skills	General
		A3	A9	A10	A15	A19	B2	B3	C5	D1
Knowledge and Understanding	a1			x		x				
	a2					x				
	a3	x	x		x	x				
	a4	x	x	x	x	x				
Intellectual skills	b1						x	x		
Professional and practical skills	c1								x	
General skills	d1									x

Course Coordinator : ( )  
 Head of Department: Dr. Ahmed El-Abbassy ( )  
 Date: --/--/2023