هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

اعتماد NCAAA T4 2020

Course Specifications

Course Title:	Cloud Computing Essentials
Course Code:	0107 CS
Program:	Computer Science (Network technology and Programming technology)
Department:	Applied Sciences
College:	Applied College
Institution:	Imam Muhammad Bin Saud Islamic University

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A. Course Identification

1. Credit hours: **3(2 theory , 2 lab)**
2. Course type **a.** University ☐ College ☐ Department ☑ Others ☐ **b.** Required ☑ Elective ☐
3. Level/year at which this course is offered: First Semester
4. Pre-requisites for this course (if any)**:** None
5. Co-requisites for this course (if any)**:** None

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	**Traditional classroom**		
2	**Blended**	4hours\week	100%
3	**E-learning**		
4	**Distance learning**		
5	**Other**		

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	**Lecture**	20
2	**Laboratory/Studio**	20
3	**Tutorial**	
4	**Others** (specify)	
	Total	40

B. Course Objectives and Learning Outcomes

1. Course Description The course aims to identify the ways in which clouds can be deployed as public, private, hybrid, and community clouds and describing the various service delivery models of a cloud computing architecture, and, followed by a much deeper review of the security and privacy issues related to cloud computing environments.
2. Course Main Objective This course should provide essential concepts, Technology & Architecture for students who want to learn and understand cloud computing, and who need to select or build cloud systems and solutions. It lays the foundation for cloud concepts, models, technologies, and mechanisms.

3. Course Learning Outcomes

	CLOs	Aligned PLOs
1	**Knowledge and Understanding**	

CLOs		Aligned PLOs
1.1	Describe the fundamental concepts of cloud computing	ع1,ع2
1.2	Recognize cloud security needs and implementation requirements	ع2
1.3	Describe the main cloud computing roles and skills required in the industry	ع1
2	**Skills :**	
2.1	Develop effective solutions using cloud technology	م1,م2
2.2	Implement could security techniques to provide required security services	م7
2.3	Communicate effectively with audience to deliver knowledge related to cloud computing	م1
3	**Values:**	
3.1	Cooperation, teamwork, and professional ethics.	ق1
3.2	Take responsibility for continuous learning and continuing personal development.	ق2
3.3	Efficient and effective time management when applying acquired knowledge and skills.	ق3

C. Course Content

No	List of Topics	Contact Hours
1	Module1:Introduction to cloud computing • History of cloud computers. • Architecture. • Why cloud computing • Cloud computing characteristics	4
2	Module2:Understanding Cloud Computing • Meaning of the cloud computing • Type of cloud computing services • Types of cloud storage services • Meaning of the cloud computing • Type of cloud computing services • Types of cloud storage services	4
3	Module3:Fundamental Concepts and Models • Roles and boundary • Cloud characteristics. • Cloud delivery model • Cloud deployment model	4
4	Module5:Cloud-Enabling Technology • Service Oriented Architecture (SOA) and Web Services • Virtualization technologies and components • Virtualization platforms like Xen, KVM, VMware, Virtual Box, Hyper -V • Virtual disk images • Network virtualization	4
5	Module6:Fundamental Cloud Security • Basic Terms and Concepts • Threat Agents	4

	• Cloud Security Threats • Additional Considerations • Case Study Example	
6	Module8:Cloud Infrastructure Mechanisms • Logical Network Perimeter • Virtual Server • Cloud Storage Device • Cloud Usage Monitor • Resource Replication	7
7	Module9:Cloud Management Mechanisms • Single Sign-On (SSO) • Cloud-Based Security Groups • Remote administration System. • Resource management system. Encryption • Hashing • Digital Signature • Public Key Infrastructure (PKI) • Identity and Access Management (IAM)	5
8	Module10:Cloud Security Mechanisms • Hardened Virtual Server Images	4
9	Module11:Cloud Architectures • Describe high availability monitoring options. • Describe switch supervisor redundancy Workload Distribution Architecture • Resource Pooling Architecture Dynamic Scalability Architecture • Elastic Resource Capacity Architecture • Service Load Balancing Architecture • Cloud Bursting Architecture • Elastic Disk Provisioning Architecture • Redundant Storage Architecture	5
Total		40

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	**Knowledge and Understanding**		
1.1	Describe the fundamental concepts of cloud computing	Class lectures Class Discussion Questions/Answers sessions in class Home work assignments Quizzes Case studies and Analysis.	Quizzes Homework and Assignments. Written exams (Midterm and final). Writing reports.
1.2	Recognize cloud security needs and implementation requirements	Class lectures Class Discussion Questions/Answers	Quizzes Homework and Assignments.

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
		sessions in class Home work assignments Quizzes Case studies and Analysis.	Written exams (Midterm and final). Writing reports. Study cases.
1.3	Describe the main cloud computing roles and skills required in the industry	Class lectures Class Discussion Questions/Answers sessions in class Home work assignments Quizzes Case studies and Analysis.	Quizzes Homework and Assignments. Written exams (Midterm and final). Writing reports. Study cases.
2.0	**Skills**		
2.1	Develop effective solutions using cloud technology	Class lectures Class Discussion Questions/Answers sessions in class Home work assignments Quizzes Case studies and Analysis.	Quizzes Homework and Assignments. Written exams (Midterm and final). Writing reports. Study cases.
2.2	Implement could security techniques to provide required security services	Class lectures Class Discussion Questions/Answers sessions in class Home work assignments Quizzes Case studies and Analysis.	Quizzes Homework and Assignments. Written exams (Midterm and final). Writing reports. Study cases.
2.3	Communicate effectively with audience to deliver knowledge related to cloud computing	Class lectures Class Discussion Questions/Answers sessions in class Home work assignments Quizzes Case studies and Analysis.	Quizzes Homework and Assignments. Written exams (Midterm and final). Writing reports. Study cases.
3.0	**Values**		
3.1	Cooperation, teamwork, and professional ethics.	Class lectures Class Discussion Questions/Answers sessions in class Home work	Quizzes Homework and Assignments. Written exams (Midterm and final).

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
		assignments Quizzes Case studies and Analysis.	Writing reports. Study cases.
3.2	Take responsibility for continuous learning and continuing personal development.	Class lectures Class Discussion Questions/Answers sessions in class Home work assignments Quizzes Case studies and Analysis.	Quizzes Homework and Assignments. Written exams (Midterm and final). Writing reports. Study cases.
3.3	Efficient and effective time management when applying acquired knowledge and skills.	Class lectures Class Discussion Questions/Answers sessions in class Home work assignments Quizzes Case studies and Analysis.	Quizzes Homework and Assignments. Written exams (Midterm and final). Writing reports. Study cases.

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Quizzes	Week3,5	10%
2	Midterm1	Week 6	15%
3	Midterm2	Week9	15%
4	Lab Assignments group or individual /Class Assignments group or individual	Week4,7,10	10%
5	Lab Evaluations	All Semester	10%
6	Final	Week13	40%

***Assessment task** (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :

3 office hours per week.
Contact through the LMS
Communication/interact via e-mails with students

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	Cloud computing :concepts, technology, & architecture By Thomas Erl, Zaigham Mahmood, Ricardo Puttini, 1st Edition, ISBN-13: 978-0133387520.
Essential References Materials	N/A
Electronic Materials	Online resources will be provided during class lectures.
Other Learning Materials	N/A

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Lecture room with Smart board Lab with 25 Pcs
Technology Resources (AV, data show, Smart Board, software, etc.)	PC and WiFi Internet access within the class room
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	N\A

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Effectiveness of teaching and assessment	Student	Indirect using course evaluation survey
Quality of learning resources	Student and Faculty	Indirect using course evaluation and faculty survey

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)
Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)
Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	
Reference No.	
Date	