



College of Information Technology
Department of Information Technology
COURSE SYLLABUS/ SPECIFICATION

Course Code & Title: ITCS 526: Cloud Computing

Weight: (3 - 0 - 3)

Prerequisite: None

NQF Level Allocated: 9

NQF Notional Hours / Credits: 120 National Hours/12 NQF Credits

Description:

This course covers how to build a cloud infrastructure based on a cloud computing reference model. The reference model includes five fundamental layers, namely, physical, virtual, control, and service and three cross-layer functions, namely business continuity, security, and service management for building a cloud infrastructure. For each layer and function, this course covers the comprising technologies, components, processes, and mechanisms. This course takes an open approach to describe concepts and technologies. Product examples are included to reinforce the concepts and technologies learnt in this course .

After completing this course, students will acquire knowledge to make informed decisions on technologies, processes, and mechanisms that are required to build cloud infrastructure

Objectives:

1. To explain Cloud computing concepts and principles
2. To discuss various approaches in cloud computing services,
3. 3. To explore cloud computing security and performance.

Semester: Second 2019-2020

Instructor: Yousif Albastaki
Office Telephone: 17298999- 8562
Email (s): yalbastaki@ahlia.edu.bh – albastakiyousif@gmail.com

Intended Learning Outcomes (ILOs):

A. Knowledge and Understanding		NQF Descriptor/ Level
A1	<u>Concepts and Theories:</u> Demonstrate knowledge and understanding of concepts and theories related to architecture of Cloud Computing and its services: IaaS, PaaS and SaaS; and appreciate the importance of security aspects through cloud computing solutions.	Knowledge: theoretical understanding [Level 9]
A2	<u>Contemporary Trends, Problems and Research:</u> Demonstrate an informed and critical awareness of the cloud computing problems, research issues and technological advancements.	Knowledge: theoretical understanding [Level 9]
A3	<u>Professional Responsibility:</u> Demonstrate cognizance of and adhere to the professional and legal standards as a cloud computing user/consumer.	Knowledge: theoretical understanding [Level 9]
B. Subject-specific Skills		NQF Descriptor/ Level
B1	<u>Problem Solving:</u> Identify appropriate cloud computing service, plan an implementation approach, and its corresponding scope for the discussed cases.	Knowledge: theoretical understanding [Level 9] Communication, ICT and Numeracy Skills [Level 9]
B2	<u>Modeling and Design:</u> Model and design a cloud solution using one of the cloud computing services.	Knowledge: theoretical understanding [Level 9] Knowledge: practical application [Level 9]
C. Critical-Thinking Skills		NQF Descriptor/ Level
C1	<u>Analytic:</u> Evaluate cloud computing services and possible approaches including identification of the corresponding benefits and challenges for each implementation.	Generic problem solving and analytical skills [Level 9] Communication, ICT and Numeracy Skills [Level 9]
C2	<u>Synthetic:</u> Design and model full cloud computing scenario including strategic objective(s) identification, corresponding service(s) selection, and the desired approach and scope implementation.	Generic problem solving and analytical skills [Level 9] Communication, ICT and Numeracy Skills [Level 9]

D. General and Transferable Skills (other skills relevant to employability and personal development)		NQF Descriptor/ Level
D1	<u>Communication</u> : Express and communicate ideas cogently, persuasively and effectively, in written and oral form, to a diverse range of audiences and stakeholders through written test, final examination, group assignment, and research project.	Communication, ICT and Numeracy Skills [Level 9]
D2	<u>Teamwork and Leadership</u> : Work effectively as a member/leader of a team of technical people who may plan, design, implement, manage, monitor and evaluate a cloud computing solution scenario.	Competence: Autonomy, Responsibility and Context [Level 9]
D4	<u>Ethical and Social Responsibility</u> : Demonstrate awareness of, and adhere to, ethical and societal responsibilities in the area of cloud computing.	Competence: Autonomy, Responsibility and Context [Level 9]

Course Structure (Outline)

Course Structure (Outline)						
Week	Hours		ILOs	Topics	Teaching Method	Assessment Method
	Lec.	Lab				
1	3	0	A1, A3	General Introduction: What is a Cloud? Cloud Service Brokerage Cloud Deployment Models	Lecture	-
2	3	0	A1,A2, A3,C1	Cloud Architecture: Building the cloud Infrastructure Cloud Computing Reference Model Options for Building Cloud Infrastructure Consideration for Building cloud Infrastructure	Lecture, Group Discussion	Assignment 1 2% A2, A3, C1, D1
3	3	0	A1,A3, B1,C1	Cloud Physical Layer: Considerations for designing cloud physical layer	Lecture	Assignment 2 2%
4	3	0	A1,B2, D2,D4	Cloud Physical Layer (cont.): Compute system Software Deployment on Compute Systems Types of Compute Systems	Software Demonstration, Group Discussion	-
5	3	0	A1,A3, B1,C1	Cloud Physical Layer(cont.): Storage System Considerations Network System Considerations	Lecture	Test1 A1, B1, C1, D1
6	3	0	A1,B2, D2,D4	Cloud Virtual Layer: Preparations for Resource Pool Introducing Virtual Resources	Software Demonstration, Group Discussion	Assignment 3 2% A2, A3, C1, D1
7	3	0	A1,A3, B1,C1	Cloud Control Layer: Types of Control Software Software-defined approach for managing IT resources in a cloud environment	Lecture	-
8	3	0	A1,B2, D1,D2, D4	Cloud Control Layer (cont.): Software defined Approach for managing cloud Resource Management Techniques	Software Demonstration, Group Discussion	-
9	3	0	A1, B1,C1, C2, D1	Cloud Service Orchestration Layer: Cloud Portal Interface Standards and Protocol	Lecture	Assignment 4 2% A2, A3, C1, D1
10	3	0	A1, C1, C2, D2	Service Orchestration Layer (cont.): Service orchestration Cloud Service Lifecycle	Lecture, Group Discussion	-
11	3	0	A1,A2 B2,C1, C2,D2	Cloud Business Continuity: Building Fault Tolerance Cloud Infrastructure	Lecture, Group Discussion	Test 2 A1, B1, C1, D1

12	3	0	A1,A2 B2,C1, C2,D2	Cloud Business Continuity (cont.): Data Protection Solution-Backup Data Protection Solution-Replication Application Resiliency for cloud	Lecture, Group Discussion	Assignment 5 2% A2, A3, C1, D1
13	3	0	A1,A2 B2,C1, C2,D2	Cloud Security: Cloud Security Threats Cloud Security Mechanisms	Lecture, Group Discussion	-
14 and 15	3	0	B2,D1, D2,D4	Students Group Project (Presentations and Reports)	Group Discussion	Group Project Evaluation B2,D1,D2,D 4
16	2					Final Exam A1,B1,C1,C2, D1

Teaching Materials:

Textbook(s):	<ol style="list-style-type: none"> 1. John Rhoton, CLOUD COMPUTING EXPLAINED :IMPLIMENTATION HANDBOOK FOR ENTERPRISES: 5th latest ED, 2013, 978-0956355607 2. John Rhoton, CLOUD COMPUTING PROTECTED : SECURITY ASSESSMENT HANDBOOK 5th LATEST ED, 2013, 978-0956355621
Handout(s):	Course notes and other teaching material available in the course website in Moodle.
Reference(s):	<ol style="list-style-type: none"> 1. Michael Collier and Robin Shahan; “Fundamentals of Azure”, Second Edition 2016. 2. Thomas Erl, Ricardo Puttini and Zaigham Mahmood; “Cloud Computing: Concepts, Technology & Architecture”, the Prentice Hall Service Technology Series from Thomas, May 20, 2013. 3. EMC Corporation “Cloud Infrastructure and Services Version 2 Student Guide”, 2014 Edition

Assessments:

Type of Assessment ¹	Description ²	ILOs ³	Weighting
Tests Test1: 5 th Mar 2020 Test2: 28 th April 2020	Two one hour Tests each 15 %. Test one cover topics from week 1 to week 5. Test two cover topics from week 6 to week 11.	A1, B1, C1	30%
Research Assignments: (Report)	Each student has to select a recently published article (within last 5 years) related to one of the specified cloud computing	A2, A3, C1, D1	10%

	topics and summarize, present, and discuss it in the class.		
Group Project: (Oral Presentation, Teamwork, and Report)	The class will be divided into groups, each group has to present a cloud solution proposal related treating specified technical problem.	B2, D1, D2, D4	20%
Final Exam:	Two-hour Final Exam consisting of essay questions. The exam will cover all the topics in the course syllabus.	A1, B1, C1, C2	40%

Overall	100%
----------------	-------------

Admissions	
Minimum number of students	4
Maximum number of students	25

Ahlia University values academic integrity. Therefore, all students must understand the meaning and consequences of cheating, plagiarism and other academic offences under the Code of Student Conduct and Disciplinary Procedures (see www.ahlia.edu.bh/integrity for more information).