



COLLEGE OF INFORMATION TECHNOLOGY
DEPARTMENT OF INFORMATION TECHNOLOGY
COURSE SYLLABUS/ SPECIFICATION

Course Code & Title:	ITCS 444 - Cloud Services Implementation
Weight:	(2- 2 - 3)
Prerequisite:	ITCS 442
NQF Level Allocated:	Level 8
NQF Notional Hours / Credits:	120 notional hours/ 12 NQF credit

Description: This course teaches IT professionals how to provision and manage services in Microsoft Azure. Students will learn how to implement infrastructure components such as virtual networks, virtual machines, containers, web and mobile apps, and storage in Azure. Students also will learn how to plan for and manage Azure AD, and configure Azure AD integration with on-premises Active Directory domains.

Objective:

1. Describe Cloud architecture components, including infrastructure, tools, and portals. Implement and manage virtual networking within Cloud and configure cross-premises connectivity.
2. Plan and create Cloud Azure VMs.
3. Configure, manage, and monitor Cloud Azure VMs to optimize availability and reliability.
4. Implement Cloud Azure App Service.
5. Plan and implement storage, backup, and recovery services.
6. Implement container-based workloads in Cloud Azure.
7. Deploy, configure, monitor, and diagnose cloud services.
8. Manage an Active Directory infrastructure in a hybrid environment.
9. Automate operations in Azure by using Azure Automation runbooks.

Semester:

Instructor (s):

Office Telephone:

Email (s):

Intended Learning Outcomes (ILOs):

A. Knowledge and Understanding		NQF Descriptor/ Level
A1	Concepts and Theories: Demonstrate critical knowledge and understanding of specialist theories, principles, and concepts of some of cloud services and its Implementations.	Knowledge: theoretical understanding [Level 8]
A2	Contemporary Trends, Problems and Research: N/A	
A3	Professional Responsibility: N/A	

B. Subject-specific Skills		NQF Descriptor/ Level
B1	Problem Solving: Critically evaluate materials related to real problems in order to design solutions related to cloud services.	Knowledge: Practical Application [Level 8]
B2	Modeling and Design: Use Specialist Skills to design components needed to implement cloud services to meet the desired needs within realistic constraints.	Knowledge: Practical Application [Level 8]
B3	Application of Methods and Tools: Demonstrate creativity in the application of utilizing virtual networks tools for developing a framework of cloud.	Knowledge: Practical Application [Level 8] Skills: Communication, ICT & Numeracy [Level 8]

C. Critical-Thinking Skills		NQF Descriptor/ Level
C1	Analytic skills: Critically analyze case studies and recommend suitable solutions Applications.	Generic Problem Solving & Analytical skills [Level 8]
C2	Synthetic: Use range of specialized cloud computing approaches to design cloud frameworks for real problems.	Generic Problem Solving & Analytical skills [Level 8]
C3	Creative Thinking and innovation: N/A	

D. General and Transferable Skills (other skills relevant to employability and personal development)		NQF Descriptor/ Level
D1	Communication: Use special skills to communicate technical information in appropriate oral and written forms to a variety of audiences.	Communication, ICT and Numeracy Skills [Level 8]
D2	Teamwork and Leadership: Operate Specialist level to work effectively as a member of a development team.	Competence: Autonomy, Responsibility and Context [Level 8]
D3	Organizational and Developmental Skills: Operate Specialist level to explain the quantitative dimensions of a problem.	Competence: Autonomy, Responsibility and Context [Level 8]
D4	Ethics and Social Responsibility:	N/A

Course Structure (Outline)

Week	Hours		ILOs	Topics	Teaching Method	Assessment Method
	Lec.	Lab				
1	2	-	A1	Module 1: Introduction to Microsoft Azure	Lecture/ Class Discussion	
	-	2	B1, B2, C1, D1	Lab: Managing Microsoft Azure	Lecture/ In-Class Supervised Work/ Lab Demonstration	In- Lab-Exercises
2	2	-	A1, B1, C1, C2	Module 2: Implementing and managing Azure networking	Lecture/ In-Class Supervised Work	In-Class Exercises
2	-	2	A1, B2, B3	Lab A: Using a deployment template and Azure PowerShell to implement Azure virtual networks	Lecture/ In-Lab Supervised Work	In- Lab-Exercises
3	2	-	B1, C2,	Module 2: Implementing and managing Azure networking (<i>continued</i>)	Lecture/ In-Class Supervised Work	In-Class Exercises
3	-	2	A1, B2, B3	Lab B: Configuring VNet peering	Lecture/ Lab Demonstration	In- Lab-Exercises
4	2	-	A1, B1,	Module 3:	Lecture/ In-Class	In-Class Exercises

			B2, B3, C1, D3	Implementing virtual machines	Supervised Work / Independent Learning	
4	-	2		Lab A: Deploying Azure VMs	Lecture/ Lab Demonstration	In- Lab-Exercises
5	2	-	B1, B2, C1	Module 3: Implementing virtual machines (<i>continued</i>)	Lecture/ In-Class Supervised Work	In-Class Exercises
5	-	2	A1, B1, B3, C1	Lab B: Deploying Azure VMs by using Azure Resource Manager templates	Lecture/ In- Lab Supervised Work/ Debate	In- Lab-Exercises
6	2	-	A1, B1, C1, C2	Module 4: Managing Azure VMs	Lecture/ In-Class Supervised Work	In-Class Exercises
	-	2	A1, B1, B2, B3, C1, D3	Lab: Managing Azure VMs	Lecture/ In-Lab Supervised Work / Independent Learning	In- Lab-Exercises/ Assignment (Week6)
7	2	-	B1, B2, C1, A1	Module 5: Implementing Azure App Service	Lecture/ In-Class Supervised Work	Oral Participation / In-Class Exercises
	-	2	C1, C2,	Lab: Implementing web apps	Lecture/ In-Lab Supervised Work	In- Lab-Exercises
8	2	-	B1, B2, B3, C2, A1	Module 6: Planning and implementing storage, backup, and recovery services	Lecture/ In-Class Supervised Work	Oral Participation / In-Class Exercises
	-	2	B1, B2, B3, C1, C2,	Lab: Planning and implementing Azure Storage	Lecture/ In-Lab Supervised Work	In- Lab-Exercises
9	2	-	C1, C2,	Module 7: Implementing containers in Azure	Lecture/ In-Class Supervised Work	In-Class Exercises
	-	2	B1, B3, C1	Lab A: Implementing containers on Azure VMs	Lecture/ Lab Demonstration	In- Lab-Exercises
10	2	-	A1, B1, B2, B3, C1, C2,	Module 7: Implementing containers in Azure (<i>continued</i>)	Lecture/ In-Class Supervised Work	Major Test/In-Class Exercises

	-	2	A1, B1, B3, C1	Lab B: Implementing Azure Container Service	Lecture/ In-Class Supervised Work/ Debate	In- Lab-Exercises
11	2	-	B1, B2, C1	Module 8: Implementing Azure Cloud Services	Lecture/ In-Class Supervised Work	In-Class Exercises
	-	2	B1, C2,	Lab: Implementing Azure Cloud Services	Lecture/ Lab Demonstration	In- Lab-Exercises
12	2	-	B1, B2, B3, C1, C2, A1	Module 9: Implementing Azure Active Directory	Lecture/ In-Class Supervised Work	Oral Participation / In-Class Exercises
12	-	2	A1, B1, B2, B3, C1, D3	Lab: Implementing Azure AD	Lecture/ In-Lab Supervised Work / Independent Learning	In- Lab-Exercises
13	2	-	A1, B1, B2, , C2,	Module 10: Managing an Active Directory infrastructure in a hybrid environment	Lecture/ In-Class Supervised Work	In-Class Exercises
13	-	2	B1, B2, B3, C1, C2,	Lab: Implementing and managing Azure AD synchronization	Lecture/ In-Lab Supervised Work	In- Lab-Exercises /Lab Project (Week13)
14	2	-	B1, B2, C1,	Module 11: Implementing Azure-based management and automation	Lecture/ In-Class Supervised Work	In-Class Exercises
14	-	2	B3, C1, C2,	Lab: Implementing Automation	Lecture/ Lab Demonstration	In- Lab-Exercises
15	2	2	B1, B2, B3, C1, C2, D1, D2, D3	Student Projects	Project Supervision	Evaluation of Project Report and Presentation
16	2	2	A1, B1, B2, C1, C2	All Topics		Final Exam

Teaching Materials:

Textbook(s):	Washam, Michael, Rick Rainey, Dan Patrick, and Steve Ross. (2018), <i>Implementing Microsoft Azure Infrastructure Solutions</i> . Microsoft Press.
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Handout(s):	Aavailable on Moodle i.e. http://www.ahlia.edu.bh/moodle
Reference(s):	<ol style="list-style-type: none"> 1. Rittinghouse, John W., and James F. Ransome. (2016), <i>Cloud computing: implementation, management, and security</i>. CRC press. 2. Bhowmik, Sandeep. (2017), <i>Cloud Computing</i>. Cambridge University Press. 3. Raja, C. Venish, K. Chitra, and M. Jonafark. (2018), A Survey on Mobile Cloud Computing.

Assessment

Method of Assessment	Description	Learning Outcomes	Weighting
In-Lab Exercises	Each practical exercise consists of a set of practical tasks to be implemented by students individually in lab as shown in the above weekly structure. Each of the exercises assesses the student's skills in the field of programming application. Students work will be observed and evaluated directly during the lab sessions	B3	Formative
In-Class Exercises	In-class exercises consist of problem solving and analysis questions.	B1, B2, C1	Formative
Oral Participation	Students will be questioned orally to demonstrate their understanding and knowledge of the topics covered during class lectures and lab sessions.	A1	Formative
Assignment	Students will be asked for one assignment. The purpose of the assignments is to assess students where they have to demonstrate their extensive and detailed knowledge and critical understanding of key concepts, theories, methods, tools and techniques of cloud services. The assignment will also assess students' skills to solve and analyze different Cloud techniques and services.	A1, B1, B2, C1, D3	10%
Lab Project	Students will be asked to develop one small programs, to implement and administrate the functionality of Cloud tools.	B1, B2, B3, D3	10%
Major Test	The test will be an in-class 90 minute exam that will consists of short-answer, essay, and create web or windows application and cover the topics studied in the first 9 weeks	A1, B1, B2, C1	20%
	Starting from weak 4, the students will be formed as a group of 3-5 students and each group will be asked to develop an Application project. In the final week, each group will have to submit their research report explaining the		

Project	research problem, research methods used, analysis and the conclusion highlighting the research findings and results. The report must explain precisely the work accomplished by each student. Each group will be required to make a presentation summarizing the research conducted and its findings. Each group member has to participate in the presentation. Group-based work will be examined and evaluated as a whole as well as the individual work of each student. Group members will be tested individually during the presentation by peers and the instructor.	B1,B2, B3,C1,C2, D1, D2, D3	20%
Final Exam	The final exam is comprehensive and practical and will be of two hours duration. It will consist of short-answer, essay and problem-solving questions to be done on computers.	A1, B1, B2, C1, C2	40%
Overall:			100 %

Admissions	
Minimum number of students	5
Maximum number of students	20

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