1	Course Name:	Cloud Computing				
	Course Code:	BMIT3273				
	Course Classification:	Elective (core)				
2	Synopsis:	This aim of this course is to introduce cloud computing concepts and the cloud service models, which are Infrastructure as a Service (IaaS), Platform as a Service (PaaS) and Software as a Service (SaaS) as part of the foundation of the cloud computing. Issues of migrating to clouds and options of either proprietary or open source cloud technologies will be discussed. Students will also learn the security aspect of cloud computing and ways to address this issue.				
3	Name(s) of Academic Staff:	1	Refer to timetable			
		2				
		3				
4	Semester and Year offered:	Year Offered		Semester		*Remarks: Refer to Programme Structures*
5	Credit Value:	3				
6	Pre-requisite/ co-requisite (if any):	NIL				

7 Course Learning Outcomes (CLO)

CLO1	Employ the knowledge of architecture and infrastructure of cloud computing including IaaS, PaaS, and SaaS. (C3, PLO2)
CLO2	Propose solutions by analysing and applying the service models of cloud computing. (C5, PLO2)
CLO3	Communicate in a team to explore the cloud computing services. (A2, PLO5)

8 Mapping of the Course Learning Outcomes to the Programme Learning Outcomes, Teaching Methods and Assessment Methods

Course Learning Outcomes	Programme Learning Outcomes (PLO)												Teaching Methods	Assessment Methods
	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6	PLO 7	PLO 8	PLO 9	PLO 10	PLO 11			
CLO1		√											L,T,P, NF2F	Quiz, Practical Assessment
CLO2		√											L,T,P, NF2F	Assignment
CLO3					√								L,T,P, NF2F	Assignment
Mapping with MQF Cluster of Learning Outcomes		C2			C3C									

Indicate the primary causal link between the CLO and PLO by ticking 'v' in the appropriate box.

C1 = Knowledge & Understanding, **C2** = Cognitive Skills, **C3A** = Practical Skills, **C3B** = Interpersonal Skills, **C3C** = Communication Skills, **C3D** = Digital Skills, **C3E** = Numeracy Skills, **C3F** = Leadership, Autonomy & Responsibility, **C4A** = Personal Skills, **C4B** = Entrepreneurial Skills, **C5** = Ethics & Professionalism

9 Transferable Skills (if applicable)

(Skills learned in the course of study which can be useful and utilized in other settings)

1	Cognitive skills
2	Communication skills
3	

Open-ended response (if any)

4	

10 Distribution of Student Learning Time (SLT)

Note: This SLT calculation is designed for home grown programme only.

	Course Content Outline and Subtopics	CLO*	Learning and Teaching Activities**									Total SLT
			Face-to-Face (F2F)								NF2F Independent Learning (Asynchronous)	
			Physical				Online/ Technology-mediated (Synchronous)					
			L	T	P	O	L	T	P	O		
1	Module 1: Introduction to Cloud Architecting Learning objectives • Recognize the basic elements of the café business case. • Describe the role of a cloud architect.	1	2	0	2						2	
2	Module 2: Fundamentals of Cloud Architecting Learning objectives • Define cloud architecture and its components. • Understand principles and best practices for designing scalable, secure, and resilient cloud solutions. • Evaluate architectures using established frameworks for cloud best practices. • Make informed decisions about cloud resource placement and design trade-offs.	1	2	0	2						2	
3	Module 3: Securing Access Learning objectives • Explain security principles in a cloud environment. • Understand the use of identity, groups, roles, and access policies to control permissions. • Apply least-privilege access principles in a multi-user cloud setup.	1,2,3	2	0	2						2	
4	Module 4: Cloud Storage Solutions Learning objectives • Define object storage and its use cases in the cloud. • Recognise the benefits and limitations of cloud storage. • Describe methods for transferring data to and from cloud storage. • Design efficient storage strategies based on application needs. • Configure and deploy static website hosting using object storage.	1,2,3	2	0	2						2	
5	Module 5: Compute Resources in the Cloud Learning objectives • Identify the role of virtual machines and containerised services in cloud environments. • Use machine images/templates for infrastructure repeatability. • Select appropriate compute instances and storage based on workload requirements. • Explain pricing models for compute resources. • Provision and manage compute instances with custom configurations.	1,2,3	2	0	2						2	
6	Module 6: Databases in the Cloud Learning objectives • Compare relational and non-relational (NoSQL) databases in cloud ecosystems. • Understand managed database services and their features. • Design and deploy cloud-native database solutions. • Explore data migration strategies to cloud databases.	1,2,3	2	0	2						2	

7	Module 7: Designing Cloud Networks Learning objectives • Explain virtual networking concepts such as subnets, gateways, and routing. • Understand public and private network configurations. • Secure resources using firewalls and access control lists. • Design and monitor virtual private networks in the cloud.	1,2,3	2	0	2						2
8	Module 8: Hybrid and Inter-Cloud Connectivity • Describe hybrid cloud connectivity between on-premises and cloud environments. • Understand peer-to-peer cloud network connectivity. • Scale and optimise cloud networks for performance and availability.	1	2	0	2						2
9	Module 9: Advanced Cloud Security Learning objectives • Implement role-based access control and identity federation. • Manage multi-account security in cloud environments. • Use encryption and key management for securing data. • Evaluate and apply cloud-native security tools based on use cases.	1,2,3	2	0	2						2
10	Module 10: Monitoring, Elasticity, and High Availability Learning objectives • Use monitoring tools and event-driven automation in cloud systems. • Implement auto-scaling and load balancing for high availability. • Scale database resources dynamically. • Design for failover and disaster recovery.	1,2,3	2	0	2						2
11	Module 11: Automating Your Architecture Learning objectives • Understand infrastructure as code (IaC) and its role in cloud architecture. • Use declarative templates to automate resource provisioning. • Explore starter templates and automation best practices. • Understand how AI-assisted tools can help with architecture generation and management.	1	2	0	2						2
12	Module 12: Caching and Content Delivery Learning objectives • Describe how caching improves performance and reduces latency. • Use content delivery networks (CDNs) to serve static and dynamic content efficiently. • Explore in-memory caching systems for accelerating databases and applications.	1	2	0	2						2
13	Module 13: Building Decoupled Architectures Learning objectives • Differentiate between tightly and loosely coupled architectures. • Use message queues and notification services to decouple application layers. • Explore event-driven communication in distributed systems.	1	2	0	2						2

14	Module 14: Building Serverless Architectures and Microservices Learning objectives • Define serverless computing and identify suitable use cases. • Understand the microservices architecture pattern. • Explore functions-as-a-service (FaaS) and container orchestration. • Describe workflow automation and API management in serverless systems.	1	2	0	2						2	
15												
16												
17												
18												
19												
20												
											SUB-TOTAL SLT:	**84**

	Continuous Assessment	%	Face-to-Face (F2F)		NF2F Independent Learning for Assessment (Asynchronous)	
			Physical	Online/ Technology-mediated (Synchronous)		
1	Quiz	20	2		10	
2	Assignment	50			10	
3						
4						
5						
					SUB-TOTAL SLT:	**22**

	Final Assessment	%	Face-to-Face (F2F)		NF2F Independent Learning for Assessment (Asynchronous)	
			Physical	Online/ Technology-mediated (Synchronous)		
1	Practical Assessment	30	2		12	
2						
3						
4						
5						
					SUB-TOTAL SLT:	**14**

	SLT for Assessment:	36
	GRAND TOTAL SLT:	120
A	% SLT for F2F Physical Component: *[Total F2F Physical /(Total F2F Physical + Total F2F Online + Total Independent Learning) x 100)]*	50.00
B	% SLT for Online & Independent Learning Component: *[(Total F2F Online + Total Independent Learning) /(Total F2F Physical + Total F2F Online + Total Independent Learning) x 100]*	**50.00**
C	% SLT for All Practical Component: *[% F2F Physical Practical + % F2F Online Practical]*	**23.33**
C1	% SLT for F2F Physical Practical Component *[Total F2F Physical Practical /(Total F2F Physical + Total F2F Online + Total Independent Learning) x 100)]*	**23.33**
C2	*% SLT for F2F Online Practical Component* *[Total F2F Online Practical / (Total F2F Physical + Total F2F Online + Total Independent Learning) x 100]*	**0.00**

Please tick (√) if this course is **Industrial Training/ Clinical Placement/ Practicum** using 50% of Effective Learning Time (ELT)

Note:

* Indicate the CLO based on the CLO's numbering in Item 8

** For ODL programme: Courses with mandatory practical requiremnets imposed by the programme standards or any related standards can be exempted from complying to the minimum 80% ODL delivery rule in the SLT.

11	Identify special requirement or resources to deliver the course (e.g., software, nursery, computer lab, simulation room etc)	Amazon Web Services, Microsoft Azure
	References (include required and further readings, and	Main references supporting the course

12	should be the most current)	1. Amazon Web Services. (n.d.). *AWS Academy.* https://aws.amazon.com/training/awsacademy/ 2. Amazon Web Services. (n.d.). *AWS Skill Builder*. https://skillbuilder.aws/
13	Other additional information (if applicable)	Nil

Note: Number of PLO indicated is purely for illustration purposes only and the number is subjected to the curriculum design.