

FACULTY OF COMPUTER APPLICATIONS

Programme	Master of Computer Applications					Branch/Spec.	Computer Applications			
Semester	II					Version	1.0.0.0			
Effective from Academic Year			2026-27			Effective for the batch Admitted in		July 2026		
Subject Code	P12E5CAS		Subject Name			Cloud Architecture and Services				
Teaching scheme						Examination scheme (Marks)				
(Per week)	Lecture (DT)		Practical (Lab.)		Total		CE	SEE	Total	
	L	TU	P	TW		Theory	40	60	100	
Credit	2	-	2	-	4	Practical	20	30	50	
Hours	2	-	4	-	6					
Objective:										
To equip students with practical skills of Google cloud and provide real-world, hands-on experience in Google Cloud										
Pre-requisites:										
Basic computer skills, basic understanding of data (Excel knowledge preferred)										
Course Outcomes :										
Name of CO	Description									
CO1	Define cloud computing concepts, Google Cloud architecture, service models, projects, billing, and Cloud SDK tools.									
CO2	Explain compute, storage, database, and container services available in Google Cloud Platform.									
CO3	Apply APIs, Cloud Endpoints, Apigee Edge, and Cloud Pub/Sub services for cloud-based application integration.									
CO4	Analyze networking and security services in Google Cloud including VPC, firewall rules, VPN, load balancing, and IAM.									
			Mapping of CO and PO							
		Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
		CO1	3	2	1	3	1	1	1	2
		CO2	3	2	2	3	1	1	1	2
		CO3	2	3	3	3	2	1	2	2
		CO4	3	3	2	3	1	1	3	2

Practical Content:		
Unit	SECTION-I	Hrs
1	Google Cloud Computing Foundations: Cloud Computing Fundamentals Introduction, Cloud Computing, Cloud vs. Traditional Architecture, IaaS, PaaS, and SaaS, Google Cloud Architecture Start with Google Cloud Platform: Introduction, The Google Cloud Console, Understanding Projects, Billing in Google Cloud Project (GCP), Install and Configure Cloud SDK, Use Cloud Shell, Introduction of Qwiklabs and the Google Cloud Platform, Getting Started with Cloud Shell and gcloud, GCP APIs, Cloud Console Mobile App	7
2	Use GCP to Build Your App: Compute Options in the Cloud, Exploring IaaS with Compute Engine, Creating a Virtual Machine, Configuring Elastic Apps with Autoscaling, Exploring PaaS with App Engine, App Engine Qwik Start – Python, Event-Driven Programs with Cloud Functions, Cloud Functions: Qwik Start - Command Line, Containerizing and Orchestrating, Apps with GKE Infrastructure in Google Cloud: Storage Options in the Cloud, Structured and Unstructured Storage in the Cloud, Unstructured Storage using Cloud Storage, Cloud Storage: Qwik Start-CLI/SDK, SQL Managed Services, Exploring Cloud SQL, Loading Data into Cloud SQL, Cloud Spanner as a Managed Service, NoSQL Managed Services Options, Cloud Datastore, a NoSQL Document Store, App Dev: Storing Application Data in Cloud Datastore – Python, Cloud Bigtable as a NoSQL Option	8
	SECTION-II	
3	APIs and PUB/SUB: The Purpose of APIs, Cloud Endpoints, Using Apigee Edge, Managed Message Services, Cloud Pub/Sub, Qwik Start – Python Security in the Cloud: Introduction to Security in the Cloud, The Shared Security Model, Encryption Options, Authentication and Authorization with Cloud IAM, User Authentication: Cloud Identity-Aware Proxy Identify Best Practices for Authorization using Cloud IAM	8
4	Networking & Security in Google Cloud: Introduction to Networking in the Cloud, Defining a Virtual Private Cloud, Public and Private IP Address Basics, Google's Network Architecture, Routes and Firewall Rules in the Cloud, VPC Networking Fundamentals, Multiple VPC Networks, VPC Networks - Controlling Access, Building Hybrid Clouds using VPNs Interconnecting and Direct Peering, Different Options for Load Balancing, HTTP Load Balancer with Cloud, Create an Internal Load Balancer	7

Practical Content:

List of programs specified by the subject teacher based on above mentioned topics

Text Books:

1	Google Cloud Platform in Action by JJ Geewax, Manning Publications
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Reference Books:

1	Google Cloud Certified Associate Cloud Engineer Study Guide by Dan Sullivan, Sybex (Wiley)
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2	Architecting Google Cloud Solutions by Sandeep Madnani, Wiley
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Web References / MOOC / Certification Course

1	https://www.skills.google/paths/36 (Google Cloud Computing Foundations Certificate)
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2	https://www.coursera.org/learn/gcp-fundamentals
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3	https://nptel.ac.in/courses/106104182
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Question Paper Scheme:

University Examination Duration: 3 Hours

Note for Examiner:

- (1) Questions 1 and 4 are compulsory with no options.
- (2) Internal options should be given in questions 2, 3, 5 and 6.

Paper Structure:

SECTION-I

Q-1 8 Marks

Q-2 11 Marks

Q-3 11 Marks

SECTION-II

Q-4 8 Marks

Q-5 11 Marks

Q-6 11 Marks