



Ganpat University
॥ विद्यया समाजोत्कर्षः ॥

Faculty of
Computer Applications



Programme		B.Sc. (Hons.) IT (Data Science) in association with Google				Branch	Computer Applications		
Semester		V				Version	1.0.0.0		
Effective from Academic Year			2026-27			Effective for the batch Admitted in		June 2024	
Subject code		U75A2CCF		Subject Name		Cloud Computing Fundamentals			
Teaching scheme						Examination scheme(Marks)			
(Per week)	Lecture (DT)		Practical (Lab.)		Total		CCE	SEE	Total
	L	TU	P	TW					
Credit	2	-	2	-	4	Theory	50	50	100
Hours	2	-	4	-	6				

Objective:

To provide students with a clear understanding of cloud computing fundamentals and Google Cloud core services, enabling them to design, deploy, and manage basic cloud solutions

Pre-requisites:

- Basic understanding of at least one programming language, shell scripting and SQL

Learning Outcome:

Name of CO	Description
CO1	Understand the fundamentals of cloud computing, including benefits, service models, and deployment models
CO2	Explain core compute services in Google Cloud, including VMs, App Engine, Cloud Functions, auto-scaling, and load balancing
CO3	Identify and use Google Cloud storage and database solutions, including Cloud Storage, Cloud SQL, Firestore, and BigQuery
CO4	Understand networking and security concepts in the cloud, including VPCs, subnets, firewall rules, IAM, and the Shared Responsibility Model
CO5	Demonstrate knowledge of deployment strategies, monitoring, logging, and cost optimization in cloud environments

Mapping of CO and PO:

Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	1	1	2	1	2	1	2	2	1	1
CO2	3	2	2	2	3	1	2	2	2	1	1	1
CO3	3	2	2	2	3	1	2	2	2	1	1	1
CO4	3	2	3	2	3	3	2	2	3	2	2	1
CO5	3	2	3	2	3	2	2	3	3	2	2	2

Content:

Unit	Content	Hrs.
1	Cloud Computing Fundamentals What is Cloud Computing? Benefits, use cases, Service Models: IaaS, PaaS, SaaS, Deployment Models: Public, Private, Hybrid, cloud service models comparison, multi cloud definition, deployment models comparison, physical architecture, virtual architecture, cloud architecture, physical vs virtual vs cloud comparison, data center evolution, cloud adoption drivers	06
2	GCP Platform Fundamentals & Onboarding GCP Overview & Vision, Global Infrastructure, Core Services Overview, Pricing Models, Billing & Cost Efficiency, Project Hierarchy, GCP Console & Tools, IAM & Security	06

3	Compute Services & Application Development Compute Basics & Comparison, Compute Engine, App Engine, Cloud Functions,(Managed Containers, Autoscaling Concepts, APIs & API Explorer, Pub/Sub (Managed Messaging),Cloud Build & CI/CD	06
4	Storage & Database Services Cloud Storage Overview & Types, Cloud Storage Service, Storage Classes, Bucket Features, Data Types, Data Selection Guidelines, Relational Database Concepts, Cloud SQL (Managed Relational DB),NoSQL Concepts, Firestore, Bigtable, Database Selection Guide	06
5	Networking, Security & Production Deployment Cloud Networking Basics, Virtual Private Cloud, Firewall Rules, Routes & Routing, Hybrid Networking, Shared Responsibility Model, IAM Principles: Identity and Access Management, IAM Roles, Encryption, Load Balancing Concepts, Load Balancer Types, Infrastructure as Code (IaC),Deployment Manager, Deployment Strategies, Cloud Monitoring, Cloud Logging, Cost Optimization	06
Practical Content:		
List of practical specified by subject teacher based on above mentioned topics		
Reference Books:		
1	Surianarayanan, C., & Chelliah, P. R. (2023). Essentials of Cloud Computing: A Holistic, Cloud-Native Perspective. Springer.	
2	Kaiser, A. K. (2024). Become GCP Cloud Digital Leader Certified in 7 Days: Getting to Know Google Cloud. Apress.	
3	Pattnaik, P. K., Kabat, M. R., & Pal, S. (2020). Fundamentals of Cloud Computing. Vikas Publishing.	
Web Reference:		
1	https://cloud.google.com/docs	
2	https://skills.google.com/learn/certificates/cloud-computing-foundations	
MOOC/Certificate Course:		
1	https://skills.google.com/learn/certificates/cloud-computing-foundations	
2	https://www.coursera.org/learn/gcp-fundamentals	
Question Paper Scheme:		
	End Semester Examination Duration: (2 Hours Theory Examination) Note for Examiner: - Q-1 Any Five out of Seven (25 Marks) Q-2 Any Two out of Three (06 Marks) Q-3 Mandatory question (05 Marks) Q-4 Any Two out of Three (08 Marks) Q-5 Any Two out of Three(06 Marks) *The question paper must comprehensively address all Course Outcomes (COs), align with Bloom's Taxonomy levels, and ensure complete syllabus coverage.	