



Course Syllabus
Gyanmanjari College of Computer Application
(BCA)

Subject : Cloud Computing Fundamentals - BCACT10316

Type of course: Major Core

Prerequisite: Basic Knowledge of Computer Networks and Network Protocols and Basic Understanding of Process and Thread Management.

Rationale:

Cloud computing has become a foundational technology across various industries, enabling scalable, on-demand access to computing resources. This course provides students with a comprehensive introduction to cloud computing concepts, models, services, and technologies. It equips them with the essential knowledge to understand, evaluate, and utilize cloud-based solutions, preparing them for roles in cloud administration, development, and related fields.

Teaching and Examination Scheme:

| Teaching Scheme | | | | Credits C | Examination Marks | | | | Total Marks | | |
|-----------------|---|---|--------|--------------|-------------------|-----|-----|-----|----------------|--|--|
| CI | T | P | SEE | | CEE | | | | | | |
| | | | Theory | | Practical | MSE | LWA | ALA | | | |
| 3 | 0 | 2 | 75 | 4 | 25 | 30 | 20 | 50 | 200 | | |

Legends: CI-Class Room Instructions; T – Tutorial; P - Practical; C – Credit; SEE - Semester End Evaluation; MSE- Mid Semester Examination; LWA - Lab Work Assessment; V – Viva voce; CCE-Continuous and Comprehensive Evaluation; ALA- Active Learning Activities.

Course Content:

| Sr. No | Course content | Hrs | % Weightage |
|--------|--|-----|-------------|
| 1 | <p>Introduction to Cloud Computing</p> <ul style="list-style-type: none"> • Introduction • Benefits, Drivers and Basic business case. • Characteristics (On-demand self-service, elasticity, measured service etc.). • Cloud Computing Service Models (IaaS, PaaS, SaaS). • Cloud Deployment Models (Public, Private, Hybrid). | 10 | 20% |



| | | | |
|---|--|----|-----|
| 2 | Cloud Computing Technologies <ul style="list-style-type: none"> • Virtualization. • Cloud Storage. • Cloud Networking. • Cloud Computing Architectures (Scalability, Elasticity etc.) | 10 | 20% |
| 3 | Cloud Platforms and Services <ul style="list-style-type: none"> • Introduction to Major Cloud Providers (AWS, Azure, GCP). • Overview of Core Services (Compute, networking, Storage, Databases). • Overview of Compute services (AWS, Lambda, Azure, Google Cloud). • Overview of Database services: Relational (RDS, Azure SQL Database, Cloud SQL), NoSQL Database (DynamoDB, Cosmos DB, Cloud Datastore). • Cloud Management Tools(Monitoring, logging, automation, orchestration). | 10 | 25% |
| 4 | Cloud Security and Management <ul style="list-style-type: none"> • Cloud Security Concepts (shared responsibility model, basic security principles). • Identity and Access Management (IAM) (Users, roles, and basic permissions). • Data Security in the Cloud • Network Security in the Cloud | 10 | 25% |
| 5 | Cloud Computing Applications and Future Trends <ul style="list-style-type: none"> • Cloud-Based Applications: Examples in common domains (e.g., web hosting, data storage). • Big Data and Analytics : Cloud-based data storage and basic analytics concepts. • Future Trends in Cloud Computing: Serverless computing and key emerging trends. | 5 | 10% |

Continuous Assessment:

| Sr. No | Active Learning Activities | Marks |
|--------|---|-------|
| 1 | Cloud Service Model Comparison: Students have to prepare a case study on cloud based services and differentiate between them and have to analyze advantage and disadvantage and upload it on GMIU web portal. | 10 |
| 2 | Selective Response: Students will be assigned a selective response-based test on GMIU web portal. | 10 |



| | | |
|--------------|---|----|
| 3 | Cloud Cost Optimization: Students will analyze the cost drivers in the scenario and research cost optimization strategies provided by cloud vendors' documentation (e.g., AWS Cost Explorer, Azure Cost Management). They will then prepare a set of Document to show costs, justifying their suggestions with evidence from the documentation and Upload on GMIU web portal. | 10 |
| 4 | Cloud Database Creation & Access: Using any cloud provider (AWS, Azure, or GCP), students will create a database instance (e.g., Amazon RDS, Azure SQL, or Google Cloud SQL), configure access, and perform basic operations such as table creation and data insertion and Upload Video/ScreenShots of it on GMIU web portal. | 10 |
| 5 | Cloud Deployment Model Analysis: Students will research real-world case studies that use different cloud deployment models (Public, Private, Hybrid) and prepare a comparative presentation and Upload it on GMIU Web portal. | 10 |
| Total | | 50 |

Suggested Specification table with Marks (Theory):75

| Distribution of Theory Marks (Revised Bloom's Taxonomy) | | | | | | |
|--|--------------------|----------------------|--------------------|----------------|-----------------|---------------|
| Level | Remembrance (R) | Understanding (U) | Application (A) | Analyze (N) | Evaluate (E) | Create (C) |
| Weightage | 25% | 45% | 15% | 15% | 0 | 0 |

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Course Outcome:

| | |
|---|--|
| After learning the course the students should be able to: | |
| CO1 | Understand core concepts of cloud computing, service models, and deployment models. |
| CO2 | Categorize cloud computing technologies like virtualization, storage, and networking. |
| CO3 | Examine cloud platforms, services offered by major cloud providers and cloud management tools. |
| CO4 | Apply cloud security concepts and implement basic security measures. |
| CO5 | Identify and describe various applications of cloud computing across different domains |



List of Practical

| Sr. No | Descriptions | Unit No | Hrs |
|--------|--|---------|-----|
| 1 | Explore Cloud Platforms and Free Services(AWS educate,google cloud docs). | 1 | 2 |
| 2 | Create a Virtual Machine using Google Cloud Skills Boost Sandbox. | 1 | 4 |
| 3 | Implement Cloud Storage with Upload and Access Files (Firebase Storage / Google Cloud Storage). | 1 | 4 |
| 4 | Host a Static Website using GitHub Pages. | 5 | 4 |
| 5 | Perform Identity and Access Management Configuration and Permissions (IAM)(ex.Google Cloud Skills Boost / Firebase Console). | 1 | 4 |
| 6 | Prepare a NoSQL Database with Firebase Firestore. | 2 | 2 |
| 7 | Deploy a Hello World Web App using Firebase Hosting. | 2 | 4 |
| 8 | Implement Serverless Computing with Firebase Cloud Functions | 3 | 2 |
| 9 | Explore Cloud Pricing with Estimation Tools (AWS / GCP / Azure Pricing Calculators) | 4 | 2 |
| 10 | Monitor Cloud Services and Logs using Firebase or GCP Tools (Firebase Monitoring / Google Cloud Logging) | 5 | 2 |
| | | Total | 30 |

Instructional Method:

The course delivery method will depend upon the requirement of content and need of students. The teacher in addition to conventional teaching method by black board, may also use any of tools such as demonstration, role play, Quiz, brainstorming, MOOCs etc.

From the content 10% topics are suggested for flipped mode instruction.

Students will use supplementary resources such as online videos, NPTEL/SWAYAM videos, e-courses, Virtual Laboratory

The internal evaluation will be done on the basis of Active Learning Assignment

Practical/Viva examination will be conducted at the end of semester for evaluation of performance of students in laboratory.



Reference Books:

- [1] "Cloud Computing Theory and Practice" : Dan c. Marinescu
- [2] "Cloud Computing Technology" : Huawei Technologies Co., Ltd
- [3] "Cloud Computing: Concepts, Technology & Architecture": Ricardo Puttini, Thomas Erl, and Zaigham Mahmood
- [4] "Google Cloud Certified Associate Cloud Engineer Study Guide": Dan Sullivan

