



Gyanmanjari
Innovative University

Course Syllabus
Gyanmanjari Diploma Engineering College
Semester-5th (Diploma)

Subject: Cloud Computing-DETCE15217

Type of course: Professional Core

Prerequisite: Prior knowledge in computer networks, operating systems is recommended.

Rationale:

Cloud Computing is a transformative technology that enables on-demand access to computing resources over the internet. This subject covers essential concepts, architectures, deployment models, and service models (IaaS, PaaS, SaaS), providing a foundation for understanding cloud-based infrastructure. It also explores virtualization, security, and privacy concerns, which are critical for secure cloud adoption. Proficiency in Cloud Computing is essential for modern IT professionals, enabling them to design scalable, flexible, and cost-effective solutions in various industries, including software development, data analytics, and enterprise IT.

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks					Total Marks
CI	T	P	C	Theory Marks		Practical Marks		CA	
				ESE	MSE	V	P	ALA	
4	0	2	5	60	30	10	20	30	150

Legends: CI-Class Room Instructions; T – Tutorial; P - Practical; C – Credit; ESE - End Semester Examination; MSE- Mid Semester Examination; V – Viva; CA - Continuous Assessment; ALA- Active Learning Activities.

Course Content:

Sr. No	Course content	Hrs.	% Weightage
1	Introduction to Cloud Computing Fundamentals of Cloud Computing and its applications, Characteristics of Cloud Computing, Challenges and Security Risks in Cloud Computing, Advantages and Disadvantages of Cloud Computing	9	15%



2	Cloud Computing Architecture & Deployment Model Describe cloud computing architecture, Cloud deployment model: Public Cloud, Private Cloud, Hybrid Cloud, Comparison of Cloud Deployment Models: Key Differences, Advantages, and Disadvantages	14	25%
3	Cloud Architecture: Service Models and Providers Cloud Service Models: Infrastructure as a Service (IaaS), Platform as a Service (PaaS), Software as a Service (SaaS), Difference of SaaS, PaaS, IaaS, Service provider: Amazon web service, Microsoft Azure, VMWARE cloud.	15	25%
4	Virtualization and Security Definition and Concept of Virtualization, Working of Virtualization, Types of Virtualization :Desktop Virtualization, Network Virtualization, Storage Virtualization, Data Virtualization, Virtualization Technologies & Hypervisors: Type 1 Hypervisor (Bare-Metal), Type 2 Hypervisor (Hosted) . Introduction to Cloud Security, Identifying Security Vulnerabilities in Cloud Infrastructure, Security at Different Levels: Network Level, Host Level, Application Level, Data Security and storage, Privacy issue, Data Life Cycle, Key Privacy concern in the cloud, Protecting Privacy	15	25%
5	Cloud Middleware Introduction about cloud Middleware, Explain Different types of cloud Middleware Open Stack Eucalyptus, Windows Azure, Cloud Sim , Eye Os, Aneka , Google App Engine.	7	10%

Continuous Assessment:

Sr. No	Active Learning Activities	Marks
1	Cloud Deployment Model Comparison: Student will individually conduct a comparative analysis of different cloud deployment models (Public, Private, and Hybrid). They will prepare a detailed report summarizing their findings and upload it to the GMIU portal.	10
2	Cloud Service Provider Analysis: Student will individually explore and analyze different cloud service providers such as AWS, Microsoft Azure, and VMware Cloud. They will create a presentation or info graphic to showcase their findings and upload it to the GMIU portal.	10



3	Virtualization Simulation: Student will individually use virtualization tools like VMware Workstation, Virtual Box, or Hyper-V to create and configure a virtual machine (VM). They will document the virtualization process, key challenges, and advantages, and upload their findings to the GMIU portal.	10
Total		30

Suggested Specification table with Marks (Theory):60

Distribution of Theory Marks (Revised Bloom's Taxonomy)						
Level	Remembrance (R)	Understanding (U)	Application (A)	Analyze (N)	Evaluate (E)	Create (C)
Weightage %	25%	35%	20%	10%	05%	05%

Course Outcome:

After learning the course, the students should be able to:

CO1	Understand Cloud Computing fundamentals, applications, characteristics, advantages, challenges, and security risks.
CO2	Explain Cloud Architecture & Deployment Models (Public, Private, Hybrid) and compare their advantages and disadvantages.
CO3	Differentiate Cloud Service Models (IaaS, PaaS, SaaS) and evaluate service providers like AWS, Azure, and VMware Cloud.
CO4	Demonstrate Virtualization Technologies (Desktop, Network, Storage, Data) and analyze Hypervisors (Type 1 & Type 2) and Assess Cloud Security.
CO5	Assess Cloud Security Middleware and suggest risk mitigation strategies.

List of Practical:

Sr. No	Description	Unit No	Hrs.
1	Study Cloud Architecture and Cloud Computing Models.	1	2
2	Implement Infrastructure as a Service (IaaS) using Open Stack: Install Open Stack on Ubuntu with Dev Stack.	2	2
3	Implement Storage as a Service.	2	2
4	Case Study: Choosing the Right Cloud Deployment Model – Analyze Public, Private, Hybrid, and Community Cloud Models.	2	2



5	Case Study: Comparative Analysis of Cloud Service Providers – Evaluate AWS, Azure, and Google Cloud.	3	2
6	Install and Work with Google App Engine.	3	2
7	Install and Work with Microsoft Azure.	3	2
8	Develop and Deploy a Hello World Web Application on Google App Engine.	3	4
9	Design an Assignment to Retrieve, Verify, and Store User Credentials using Firebase Authentication and Google Cloud Data store.	3	4
10	To study about Aneka.	5	2
11	Install and Configure Virtualization using KVM.	4	4
12	Case Study: Data Security and Privacy in a Cloud-Based Healthcare System – Analyze Infrastructure Security and Privacy Issues.	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, MOOC's 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: Concepts, Technology & Architecture, Thomas Erl, Ricardo Puttini, Zaigham Mahmood, Pearson Service,
- [2] Cloud Computing for Dummies, Judith Hurwitz, Robin Bloor, Marcia Kaufman, Fern Halper, Wiley Publications,
- [3] Cloud Computing Black Book, Kailash Jayaswal, Jagannath Kallakurechi, Donald J. Houde, Dr. Deven Shah, Dreamtech Press,
- [4] Cloud Computing: SaaS, PaaS, IaaS, Virtualization, Business Models, Mobile, Security and More, Kris Jamsa, Jones & Bartlett Learning.

