GANPAT UNIVERSITY

FACULTY OF COMPUTER APPLICATIONS

Programme	Master of Computer Applications	**Branch/Spec.**	Computer Application
Semester	III	**Version**	1.0.0.2
Effective from Academic Year	2023-24	**Effective for the batch Admitted in**	June 2022
Subject Code	P13A5CC2	**Subject Name**	Cloud Computing-II

Teaching scheme						**Examination scheme (Marks)**			
(Per week)	**Lecture (DT)**		**Practical (Lab.)**		**Total**		**CE**	**SEE**	**Total**
	L	TU	P	TW					
Credit	2	0	2	0	4	Theory	40	60	100
Hours	2	0	4	0	6	Practical	20	30	50

Objective:

- Students can understand and hands on the concepts of cloud computing with Cloud Middleware such as Cloud enabling Technologies, Cloud Architecture, Services and Storage, Management and Monitoring, Security and Privacy

Pre-requisites:

- Operating System Concepts, Computer Network Concepts, Programming concepts, Fundamental of Cloud Computing

Course Outcomes :

- **1 = Slight (Low); 2 = Moderate (Medium); 3 = Substantial (High); "-" = No Correlation**

Name of CO	**Description**
CO1	Describe cloud enabling technologies including SOA, virtualization concepts, VM provisioning, migration, and hypervisors.
CO2	Analyze cloud architectures, deployment models, service models, and cloud storage solutions.
CO3	Apply SLA metrics, monitoring tools, and pricing models for effective cloud resource management.
CO4	Evaluate cloud middleware platforms to select appropriate cloud solutions.
	Mapping of CO and PO

CO \ PO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**
CO1	3	1	–	2	–	–	–	1
CO2	2	3	2	2	–	–	–	1
CO3	2	2	–	3	1	2	–	1
CO4	1	2	2	3	–	–	–	2

Content:

Unit	SECTION-I	Hrs
1	**Cloud enabling Technologies:** Service Oriented Architecture – REST and Systems of Systems – Web Services – Publish Subscribe Model – Basics of Virtualization – Need for Virtualization – Pros and cons of Virtualization – Types of Virtualization – System VM, Process VM, VM provisioning process, VM Migration techniques, Virtual Machine monitor – Virtual machine properties - Interpretation and binary translation, VM - Hypervisors – Xen, KVM , VMWare, Virtual Box, Hyper-V	8
2	**Cloud Architecture, Services and Storage:** Layered Cloud Architecture Design– Public, Private and Hybrid Clouds – IaaS – PaaS – SaaS – Architectural Design Challenges – Cloud Storage – Storage-as-a-Service – Advantages of Cloud Storage – Cloud Storage Providers – S3	7
	SECTION-II	
3	**Management and Monitoring:** Service quality metrics and SLAs (service level agreements), SLA Guidelines, cloud usage monitor, SLA Management, Introduction to Monitoring, Needs for monitoring, Cloud monitoring tools, Resource Allocation and Pricing in Cloud	7
4	**Cloud Middleware:** OpenStack, OpenNebula, Windows Azure, CloudSim, EyeOs, Aneka, Google App Engine, Amazon EC2, CloudSim	8

Practical Content:	
List of programs specified by the subject teacher based on above mentioned topics.	
Text Books:	
1	Rajkumar Buyya, James Broberg, Andrzej M Goscinski, Cloud Computing: Principles and Paradigms, Wiley publication
Reference Books:	
1	Toby Velte, Anthony Velte, Cloud Computing: A Practical Approach, McGraw-Hill Education 2017.
2	Thomas Erl, Z Mahmood and Ricardo Puttini, Cloud computing concepts, technology and architecture, Publisher : PHI; 1st edition)23 May2013.(
MOOC/Certification Courses:	
1	https://onlinecourses.nptel.ac.in/noc23_cs27/preview
2	https://www.edx.org/course/google-cloud-computing-foundations-cloud-computing-fundamentals
3	https://www.edx.org/course/aws-cloud-technical-essentials
4	https://www.edx.org/course/introduction-to-cloud-computing-6
5	https://nptel.ac.in/courses/106105167

Question Paper Scheme:

University Examination Duration: 3 Hours

Note for Examiner: -

(I) Questions 1 and 4 are compulsory with no options.

(II) Internal options should be given in questions 2, 3, 5 and 6.

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