Faculty of Engineering & Technology
Master of Technology (M. Tech)
(W. E. F.: 2023-24)

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Name of Faculty	:	Faculty of Engineering & Technology
Name of Program	:	Master of Technology (M. Tech)
Course Code	:	2MSE05
Course Title	:	Cloud Computing
Type of Course	:	PC
Year of Introduction	:	2023-24

Prerequisite	:	Computer Network
Course Objective	:	The course objectives of a cloud computing course may vary depending on the institution or program offering the course. However, here are some common objectives that are often covered in cloud computing courses: Understanding Cloud Computing, Cloud Architecture, Cloud Service Models etc
Course Outcomes	:	At the end of this course, students will be able to:
	CO1	Assess and examine advantages and disadvantages of virtualization technology.
	CO2	Compose services in a distributed computing environment to achieve tasks relevant to a knowledge-based business or public service.
	CO3	Evaluate a set of business requirements to determine suitability for a cloud computing delivery model.
	CO4	Explore the various cloud computing architectures and paradigms.
	CO5	Deployment of cloud and identify security implications in cloud computing.
	CO6	collaboratively research and write a research paper, and present the research online

Teaching and Examination Scheme

Teaching Scheme (Contact Hours)			Credits	Examination Marks				
				Theory Marks		Practical Marks		Total Marks
L	T	P	C	SEE	CIA	SEE	CIA	
4	0	2	5	70	30	30	20	150

Legends: ***L****-Lecture;* ***T****–Tutorial/Teacher Guided Theory Practice;* ***P*** *– Practical,* ***C*** *– Credit,* ***SEE*** *– Semester End Examination,* ***CIA*** *- Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.))*

Course Content

Unit No.	Topics	Teaching Hours	Weightage	Mapping with CO
1	**Fundamental of Virtualization** Type of Virtualization, Virtualization Technologies, virtualize your Environment, Managing Virtualization Environment, Storage Virtualization.	04	05%	CO3
2	**Fundamental Concepts and Models** Roles and Boundaries, Cloud Characteristics, Cloud Delivery Models, Cloud Deployment Models.	04	05%	CO1
3	**Cloud-Enabling Technology** Broadband Networks and Internet Architecture, Data Center Technology, Virtualization Technology, Web Technology, Multitenant Technology, Service Technology.	06	09%	CO2
4	**Fundamental Cloud Architectures** Workload Distribution Architecture, Resource Pooling Architecture, Dynamic Scalability Architecture, Elastic Resource Capacity Architecture, Service Load Balancing Architecture, Cloud Bursting Architecture, Elastic Disk Provisioning Architecture, Redundant Storage Architecture	12	17%	CO3
5	**Advanced Cloud Architectures** Hypervisor Clustering Architecture, Load Balanced Virtual Server Instances Architecture, Non-Disruptive Service Relocation Architecture, Zero Downtime Architecture, Cloud Balancing Architecture, Resource Reservation Architecture, Dynamic Failure Detection and Recovery Architecture, Bare-Metal Provisioning Architecture, Rapid Provisioning Architecture, Storage Workload Management Architecture.	15	26%	CO4
6	**Specialized Cloud Architectures** Direct I/O Access Architecture, Direct LUN Access Architecture, Dynamic Data Normalization Architecture, Elastic Network Capacity Architecture, Cross-Storage Device Vertical Tiering Architecture, Intra-Storage Device Vertical Data Tiering Architecture, Load Balanced Virtual Switches Architecture, Multipath Resource Access Architecture, Persistent Virtual Network Configuration Architecture, Redundant Physical Connection for Virtual Servers	15	28%	CO5

	Architecture, Storage Maintenance Window Architecture.			
7	**Build Cloud Application using Cloud stack** Apache Cloud Stack Architecture, Apache Cloud Stack Configuration	04	10%	CO5

Suggested Distribution of Theory Marks Using Bloom's Taxonomy						
Level	Remembrance	Understanding	Application	Analyse	Evaluate	Create
Weightage	**40**	**20**	**20**	**10**	**-**	**10**

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

Suggested List of Experiments/Tutorials

Sr. No.	Name of Experiment/Tutorial	Teaching Hours
1	Sketch out and analyze architecture of Aneka / Eucalyptus / KVM identify different entities to understand the structure of it.	02
2	Create a scenario in Aneka / Eucalyptus to create a datacentre and host. Also create virtual machines with static configuration to run cloudlets on them.	02
3	Make and perform scenario to pause and resume the simulation in Aneka / Eucalyptus entity, and create simulation entities dynamically Organize a case in Aneka / Eucalyptus for simulation entities in run-time using a its toolkit support and manage virtual cloud.	01
4	Organize a case in Aneka / Eucalyptus for simulation entities in run- time using a its toolkit support and manage virtual cloud.	01
5	Sketch out and analyze architecture of Microsoft Azure	01
6	Sketch out and analyze architecture of Amazon Web Service (AWS).	01
7	Categorize Microsoft Azure Services and discuss on each	01
8	Categorize Amazon Web Service (AWS) and implement its various cloud entities using its Cloud Toolbox support	02
9	Implement and use sample cloud services with the help of Microsoft Azure.	02
10	Create a sample mobile application using Microsoft Azure account as a cloud service. Also provide database connectivity with implemented mobile application.	02
11	Create a sample mobile application using Amazon Web Service (AWS) account as a cloud service. Also provide database connectivity with implemented mobile application.	02

Reference Books

Sr. No.	Name of Reference Books
1	Ravi Shankar, Navin Sabharwa "Cloud Computing First Steps: Cloud Computing for Beginners" CreateSpace Independent Publishing Platform
2	Rajkumar Buyya, James Broberg, Andrzej Goscinski "Cloud Computing: Principles and Paradigms" Wiley
3	Judith Hurwitz, Robin Bloor "Cloud Computing For Dummies" , for Dummies