Cloud Computing			
Course Code	**22AIM73**	CIE Marks	50
Course Type (Theory/Practical/Integrated)	Theory	SEE Marks	50
		Total Marks	100
Teaching Hours/Week (L:T:P)	3:0:0	SEE	3 Hours
Total Hours	40 Hours	Credits	03

Course Learning Objectives: The objective of the course is to

- Introduce the rationale behind the cloud computing revolution and the business drivers.
- Understand various models, types and challenges of cloud computing.
- Understand the design of cloud native applications, the necessary tools and the design tradeoffs.
- Realize the importance of Cloud Virtualization, Abstraction`s, Enabling Technologies and cloud security.

Module-1 Distributed System Models and Enabling Technologies (8 hours)

Distributed System Models and Enabling Technologies: Scalable Computing Over the Internet, Technologies for Network Based Systems, System Models for Distributed and Cloud Computing, Software Environments for Distributed Systems and Clouds.
Textbook 1: Chapter 1: 1.1 to 1.4

Module-2 Virtual Machines and Virtualization of Clusters (8 hours)

Virtual Machines and Virtualization of Clusters : Implementation Levels of Virtualization, Virtualization Structure/Tools and Mechanisms, Virtualization of CPU/Memory and I/O devices, Virtual Clusters and Resource Management.
Textbook 1: Chapter 3: 3.1 to 3.4

Module-3 Cloud Platform Architecture over Virtualized Datacenters (8 hours)

Cloud Platform Architecture over Virtualized Datacenters: Cloud Computing and Service Models, Data Center Design and Interconnection Networks, Architectural Design of Compute and Storage Clouds, Public Cloud Platforms: GAE, AWS and Azure.
Textbook 1: Chapter 4: 4.1 to 4.4

Module-4 Cloud Security (8 hours)

Cloud Security: Security, The top concern for cloud users, Cloud Security Risks, Privacy Impact Assessment, Security of Database Services, Operating System security, Virtual Machine Security.
Cloud Security and Trust Management: Cloud Security Defense Strategies, Distributed Intrusion/Anomaly Detection, Data and Software Protection Techniques, Reputation-Guided Protection of Data Centers.
Textbook 2: Chapter 11: 11.1,11.2,11.3,11.6,11.7,11.8
Textbook 1: Chapter 4: 4.6

Module-5 Cloud Programming and Software Environments (8 hours)

Cloud Programming and Software Environments: Features of Cloud and Grid Platforms, Parallel and Distributed Computing Paradigms, Programming Support for Google App Engine, Programming on Amazon AWS and Microsoft
Textbook 1: Chapter 6: 6.1 to 6.4

Course Outcomes: At the end of the course the student will be able to:	
22AIM73.1	Describe various cloud computing platforms and service providers.
22AIM73.2	Illustrate the significance of various types of virtualization.
22AIM73.3	Identify the architecture, delivery models and industrial platforms for cloud computing based applications.
22AIM73.4	Analyze the role of security aspects in cloud computing.

22AIM73.5	Demonstrate cloud applications in various fields using suitable cloud platforms.
22AIM73.6	Investigate emerging trends and best practices in cloud computing.

Sl. No.	Title of the Book	Name of the Author/s	Name of the Publisher	Edition and Year
Textbooks				
1.	Distributed and Cloud Computing	Kai Hwang, Geoffrey C Fox, and Jack J Dongarra	Morgan Kaufmann, Elsevier	2012
2.	Cloud Computing: Theory and Practice	Dan C Marinescu	Morgan Kaufmann, Elsevier	3rd Edition, 2023
Reference Books				
1	Cloud Computing Implementation, Management and Security	John W Rittinghouse, James F Ransome	CRC Press	2013
2	Computing Principles and Paradigms	RajkumarBuyya , James Broberg, Andrzej Goscinsk,	John Wiley & Sons	2014

Web links and Video Lectures (e-Resources):

- https://www.youtube.com/watch?v=EN4fEbcFZ_E
- https://www.youtube.com/watch?v=RWgW-CgdIk0
- https://www.geeksforgeeks.org/virtualization-cloud-computing-types/
- https://www.tpointtech.com/cloud-service-provider-companies
- http://www.digimat.in/nptel/courses/video/106105167/L01.html

Course Articulation Matrix

Course Outcomes (COs)	Program Outcomes (POs)													
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
22AIM73.1	1	2												

22AIM73.2	2	1			1		2			2				
22AIM73.3		2	2		2		2			3			2	
22AIM73.4			1		1	2				2				
22AIM73.5					2		2			2				
22AIM73.6		2	3											3

1: Low 2: Medium 3: High