GUJARAT TECHNOLOGICAL UNIVERSITY

Program Name: Master of Engineering

Level: PG

Branch: Internet of Things

Course / Subject Code : ME01062051

Course / Subject Name: Cloud Computing and Storage

w. e. f. Academic Year:	2024-25
Semester:	1st Semester
Category of the Course:	PEC I

Prerequisite:	Basic knowledge of Internet of Things, Data Science, and C/ Python programming
Rationale:	Due to the increase of data generation from various sources, there are issues related to the store, computing, maintenance, control, security, analysis, and access of the huge data. The cloud is structured to solve these issues. For the students, it is required to study various architectures, platforms, and end-to-end designs for reduced data storage cost, computing and analysis of the data, easy access, scalability of the data, security of the data, maintenance & control of the data. In the course, the students are explored various architectures, computing capabilities, and platforms to improve use of data effectively.Provide a systematic and comprehensive approach to the hardware and the software high-performance techniques involved in the current era of IoT applications

Course Scheme:

Teaching Scheme			Total Credits	Assessment Pattern and Marks				Total Marks
				Theory		Practical		
L	T	PR	C	ESE (E)	PA(M)	ESE (V)	PA (I)	
03	00	02	04	70	30	30	20	150

Course Content:

Sr No	Course Content	No of Hours	% of Weightage

1	UNIT-I - Introduction to Cloud Computing: Overview, Roots of Cloud Computing, Layers and Types of Cloud, Desired Features of a Cloud, Benefits and Disadvantages of Cloud Computing, Cloud Infrastructure Management, Infrastructure as a Service Providers, Platform as a Service Providers, Challenges and Risks, broad approaches to migrating into the cloud, the seven-step model of migration into a cloud.	08	15
2	UNIT-II: Integration as a Service Paradigm: The evolution, challenges and approaches of SaaS paradigm, new integration scenarios, the integration methodologies, SaaS integration products and platforms, SaaS integration services, business-to-business integration services, a framework of sensor - cloud integration, SaaS integration appliance.	06	15
3	UNIT-III: Virtual Machines Provisioning and Migration Services: Introduction, Inspiration & background, virtual machines provisioning and manageability, virtual machines migration services, VM provisioning and migration in action, provisioning in the cloud context.	08	20
4	UNIT-IV: Cluster as a Service Paradigm & Distributed Data Storage: Introduction, RVWS design, the logical design, proof of concepts and future research directions, Secure Distributed Data Storage: Introduction, cloud storage, technologies for data security, challenges	08	20
5	UNIT-V: Integration of Private and Public Clouds: Introduction, technologies and tools for cloud computing, Aneka cloud platform, Aneka resource provisioning service, hybrid cloud implementation,	06	15
6	UNIT-VI: Cloud Application Architectures: Development environments for service development; Amazon, Azure, Google Appcloud platform in industr	06	15

Reference Book:

1. Rajkumar Buyya, James Broberg, Andrzej Goscinski, "Cloud Computing - Principles and Paradigms, Wiley,
2. Rajkumar Buyya, Christian Vecchiola, S.Thamarai Selvi, Mastering Cloud Computing: Foundations and Applications Programming, Morgan Kaufmann Publication, 2013.
3. Barrie Sosinsky, "Cloud Computing Bible" Wiley Publishing Inc.,
4. Miller Michael, "Cloud Computing: Web Based Applications that Change the Way You Work and Collaborate Online", Pearson Education India
5. Velte T. , Velte A, Elesnpeter R., "Cloud Computing – A practical Approach", Tata McGraw Hill

Course Outcome:

After completion of the Course, Students will be able to:

No	Course Outcomes	RBT Level*
01	Understand the architectures, infrastructures, models of cloud computing	UN
02	Apply virtualization in cloud computing and storage	AP
03	Apply various cloud designs and architectures for practical problems	AP
04	Analyze of various existing cloud platforms, cloud architectures	AN
05	Evaluate a transactional web application efficient and market-based cloud computing	EL

*RM: Remember, UN: Understand, AP: Apply, AN: Analyze, EL: Evaluate, CR: Create

Suggested Course Practical List:

- The practical work will be carried out based on the content covered during the academic sessions.

List of Laboratory/Learning Resources Required:

- List of Hardware: IoT Builder Platform, cloud platforms
- List of Useful websites/MOOCs: https://onlinecourses.nptel.ac.in/noc21_cs14/preview

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