

GUJARAT TECHNOLOGICAL UNIVERSITY
Integrated-MCA
Year – V (Semester – IX) (W.E.F. JUNE 2017)

Subject: Cloud Computing
Subject Code: 4490606

Learning Objectives:

- To provide an understanding of the basic concepts of parallel and distributed computing and their role in Cloud Computing.
- To study the concept of Virtualization and relevant technologies available in the market
- To understand the importance of Cloud computing for higher throughput
- To make aware about availability of various Cloud platforms
- To study different application of Cloud and Cloud management techniques

Prerequisites:

- Basic knowledge of Computer Networks and Network protocol suits
- Understanding of process and thread management

Course Contents:

Unit No	Contents	Hours
1	<p>Overview of Distributed Computing: Computing, Traditional Utilities, Creation of the Internet, computing Paradigm Trends, Computing Paradigm Evolution, cloud computing: A New Paradigm, Differences and Similarities Among different types of computing.</p> <p>Introduction to Cloud Computing: Definition, Central Ideas Behind Cloud Computing, Properties and Characteristics of Cloud Computing, Benefits of Cloud Computing, Cloud Service and Deployment Models, Organizational Scenario of Cloud: Cloud Deployment Model, Cloud Architecture, Cloud Vocabulary, Challenges with Cloud Computing, Cloud Supporting Services, Management and Administration of Cloud Services.</p>	8

2	<p>Virtualization Techniques: Virtualization Technology, Overview of X86 Virtualization, Types of virtualization, Virtualization products, Concept of VLAN and Benefits, Concept of SAN and Benefits, VM Migration, VM Consolidation and Management, Cloud Interoperability Standards.</p> <p>SLA with Cloud Service Providers: The concept of SLA, SLA Aspects and Requirements, Service Availability, Cloud Outages, Credit calculation for SLA Breaches, Sample SLA for Amazon, Rackspace, Google, HP etc.</p>	8
3	<p>Risk, Consequences and costs for cloud computing: Introducing Risks in cloud computing, Risk Assessment and Management, Risk of vendor lock-in, loss of control, not meeting regulatory compliance, resource scarcity or poor provisioning, Multi-tenant Environment, failure, supply chain, Inadequate SLA, malware and Internet attack, Management of Cloud Resources, Network Outage, Physical Infrastructure, Legal Risks due to Legislation, Risk with Software and Application Licensing, Security and compliance requirements for public cloud, Calculating total cost of ownership(TCO) for cloud computing, direct and indirect Cloud costs, Cost allocation in the cloud, Chargeback model for Allocation of Direct and indirect costs, Chargeback Methodology, cost, Billable Items, Atomic Unit, Pricing Model, Chargeback tools and solutions, maintaining Strategic Flexibility in a cloud.</p>	8
4	<p>Application Architecture for cloud: Cloud Application Requirement, Architecture for Traditional versus Cloud Applications, Assumptions for Traditional and Cloud Applications, Recommendation for cloud Application Architecture, Fundamental Requirements for cloud application Architecture, Relevance and Use of Client-server Architecture for cloud Applications, Addressing Cloud Application Performance and Scalability, Service Oriented Architecture(SOA) for cloud Applications</p>	8
5	<p>Introduction to Google App Engine: The Runtime Environment, The Static file servers, The Datastore, The Services, Google Accounts, Task Queues and cron jobs, Developer tools, Administration console</p> <p>Creating an Application: Setting the SDK, Developing an application, Registering the application, deploying the Application, Uploading the Application. Handling Web Requests: The App Engine Architecture, Configuring the Frontend , How App Runs, Quotas and Limits</p>	10
6	<p>DataStore Entities: Entities, keys and Properties, DataStore API, Property values, Keys and Key Objects, Using Entities, Persistence API : Setting Up JPA , Entities and Keys , Entity Properties , Embedded Objects , Saving, Fetching, and Deleting Objects , Transactions in JPA , Queries and JPQL Relationships</p>	10

Reference 1 (Main Reference)

1. Rishabh Sharma: Cloud Computing Fundamentals, Industry Approach and Trends: Wiley Publication.(ISBN: 978-81-265-5306-8)
2. Kailash Jayaswal, Jagannath Kallakurchi, Donald J Houde, Dr. Deven Shah : Cloud Computing :Black Book Dreamtech Publications(ISBN 978-93-5119-418-7)
3. Dan Sanderson: Programming Google App Engine: O'Reilly| Google Press: (ISBN-978-0-596-52272-8)

Suggested Additional Reading

1. Cloud Computing: A practical approach by Anthony T. Vetle – Tata McGraw Hill Education Private Limited (2009)
2. Rajkumar Buyya, Christian Vechhiola, S.Thamarai Selvi, “Mastering Cloud Computing “, McGraw Hill Education (India) Private Limited.
3. Cloud Computing For Dummies-- [Judith Hurwitz](#) , [Robin Bloor](#) , [Marcia Kaufman](#) , [Fern Halper](#) - – Wiley India Pvt Ltd
4. Cloud Computing: SaaS, PaaS, IaaS, Virtualization, Business Models, Mobile, Security and More (Student Edition) - Kris Jamsa- Published by - Jones & Bartlett Learning

Chapter wise Converge from Main Reference:

Unit #	Book #	Chapters
Unit 1	1	1,2
Unit 2	1,2	4,18
Unit 3	2	19
Unit 4	2	12
Unit 5	3	1,2,3
Unit-6	3	4,8

Accomplishment of the Student after Completing the Course:

- Understand the principals of Cloud computing
- Ability to understand the concepts of virtualization
- Gain an exposure about Google App Engine for Java. Able to Develop Web apps using Google App Engine Cloud PaaS.
- Aware about various services provided by Cloud Computing (SaaS, IaaS, HaaS etc...)
- Gain an exposure about various Cloud platforms available in the IT market