

GUJARAT TECHNOLOGICAL UNIVERSITY

MASTER OF COMPUTER APPLICATION (COURSE CODE-6)

Year – II (Semester – IV)

Subject: Virtualization & Applications of Cloud

Subject Code: 2640020

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>Introduction to Cloud Computing: Cloud Computing basics, History to Cloud Computing, Importance of Cloud Computing in the Current Era, Characteristics of Cloud Computing and What Cloud Computing Really is?</p> <p>Move to Cloud Computing: Pros and Cons of Cloud Computing, Nature of Cloud, Technologies in Cloud Computing, Migrating into the Cloud</p> <p>Types of Cloud: Public and Private Cloud, Cloud Infrastructure, Cloud Application Architecture</p> <p>Working of Cloud Computing: Trends in Computing, Cloud Service Models, Cloud Deployment Models, Pros and Cons of Cloud Computing, Cloud Computing and Services</p> | 12 |

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| | <p>Cloud Architecture: Cloud Computing Logical Architecture, Developing Holistic, Cloud Computing Reference Model, Cloud System Architecture, Cloud Deployment Model</p> <p>Cloud Services: Cloud Types and Services, Software as a Service (SaaS), Platform as a Service (PaaS), Infrastructure as a Service(IaaS), Other Cloud Services</p> | |
| 2 | <p>Foundations: Definition of Virtualization, Adopting Virtualization, Virtualization Architecture and software, Virtual Clustering, Virtualization Applications, Pitfalls of Virtualization</p> <p>Grid, Cloud and Virtualization: Virtualization in Grid, Virtualization in Cloud, Virtualization in Cloud Security</p> <p>Virtualization and Cloud Computing: Anatomy of Cloud Infrastructure, Virtual Infrastructures, CPU Virtualization, Network and Storage Virtualization</p> | 8 |
| 3 | <p>Data Storage: Introduction to Enterprise Data Storage, Data Storage Management, File Systems ,Cloud Data Stores, Using Grids for Data Store</p> <p>Cloud Storage: What is Cloud Storage?, Overview of Cloud Storage, Data Management for Cloud Storage, Provisioning Cloud Storage, Data-intensive Technologies for Cloud Computing</p> <p>Cloud Storage from LANs to WANs: Introduction, Cloud Characteristic, Distributed Data Storage, Applications Utilizing Cloud Storage</p> <p>Risks in Cloud Computing: Introduction, Risk Management, Cloud Impact, Enterprise Wide Risk Management, Types of Risks in Cloud</p> <p>Data Security in Cloud: Introduction, Current State, Homo Sapiens and Digital Information, Cloud, Digital Persona and Data Security, Content Level Security</p> <p>Cloud Security Services: Objectives, Confidentiality , Integrity and Availability, Security Authorization Challenges in the Cloud, Secure Cloud Software Requirements, Secure Cloud Software Testing</p> | 12 |
| 4 | <p>Tools and Technologies for Cloud: Parallel Computing, Eras of Computing, High Performance Parallel Computing with cloud and cloud Technologies, Cloud Computing Application Platform, Cloud Computing Platform, Tools for Building Cloud</p> <p>Microsoft Cloud Services: Introduction, Windows Azure Platform</p> | 8 |

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| | <p>Google Cloud Applications: Google Applications Utilizing Cloud, Google App Engine</p> <p>Amazon Cloud Services: Understanding Amazon Web Components and Services, Elastic Compute Cloud (EC2), Amazon Storage System, Amazon Database Services</p> <p>Cloud Applications: Cloud – Based Solutions, Cloud Computing Services, Cloud Software for Private Banking, Cloud Software for Asset Management, Cloud Software for Fund Management</p> | |
| 5 | <p>Google App Engine(GAE): Understand the development of scalable web application on Google’s cloud, Build and deploy simple web applications to Google’s cloud, Develop simple application using Google App Engine (GAE) and its services</p> | 8 |

Reference 1 (Main Reference)

“Cloud Computing A practical approach for learning and implementation” by A.Srinivasan and J.Suresh Pearson Publications (Unit # : 1,2,3,4)

Unit 5:

<http://appengine.google.com>

<http://cloud.google.com/appengine/docs/java/tools/uploadinganapp>

<https://cloud.google.com/appengine/docs/java/tools/eclipse>

<https://cloud.google.com/appengine/docs/java/gettingstarted>

<https://cloud.google.com/appengine/docs/java/gettingstarted/setup>

<https://cloud.google.com/appengine/docs/java/gettingstarted/creating>

https://cloud.google.com/appengine/docs/java/gettingstarted/ui_and_code

Suggested Additional Reading

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

4. Cloud Computing Bible - Barrie Sosinsky – Wiley India Pvt Ltd (2011)

5. Rajkumar Buyya, Christian Vechhiola, S.Thamarai Selvi , “Mastering Cloud Computing “, McGraw Hill Education (India) Private Limited.

Chapter wise Converge from Main Reference:

| Unit # | Chapters |
|--------|-------------------|
| Unit 1 | 1,2,3,4,6,16 |
| Unit 2 | 8,9,10 |
| Unit 3 | 11,12,13,18,19,20 |
| Unit 4 | 24,29,30,31,32 |

Accomplishment of the Student after Completing the Course:

- Understand the role of thread and process in distributed and parallel processing and can aware about the transformation of a stand alone or web based application from distributed and/or parallel to Cloud application
- Understand the principals of Cloud computing
- Ability to understand the concepts of virtualization
- Gain an exposure about Google App Engine for Java
- Aware about various services provided by Cloud Computing (SaaS, IaaS, HaaS etc...)
- Gain an exposure about various Cloud platforms available in the IT market