IV/IV B. TECH. FIRST SEMESTER
CLOUD COMPUTING (Elective-I)

Course Code: CS 7T4A **Credits: 3**
Lecture:3 periods/week **Internal assessment: 30 Marks**
Tutorial: 1period/week **Semester end examination: 70 Marks**

Prerequisites: Discrete Mathematics, Computer Networks

Course Objectives:

1. To understand the concepts of Cloud Computing.
2. To learn Taxonomy of Virtualization Techniques.
3. To learn Cloud Computing Architecture.
4. To acquire knowledge on Aneka Cloud Application Platform.
5. To learn Industry Cloud Platforms.

Course Outcomes:
At the end of this course student will:

CO1) Understand the concept of virtualization and how this has enabled the development of Cloud Computing

CO2) Know the fundamentals of cloud, cloud Architectures and types of services in cloud

CO3) Understand scaling, cloud security and disaster management

CO4) Design different Applications in cloud

CO5) Explore some important cloud computing driven commercial systems

Syllabus:

UNIT 1
Introduction to Cloud: Cloud Computing at a Glance, The Vision of Cloud Computing, Defining a Cloud, A Closer Look, Cloud Computing Reference Model. Characteristics and Benefits, Challenges Ahead, Historical Developments.

Virtualization: Introduction, Characteristics of Virtualized Environment, Taxonomy of Virtualization Techniques, Virtualization and Cloud computing, Pros and Cons of Virtualization, Technology Examples- VMware and Microsoft Hyper-V.

Before the Move into the Cloud: Know Your Software Licenses, The Shift to a Cloud Cost Model, Service Levels for Cloud Applications.

UNIT 2

Cloud Computing Architecture : Introduction, Cloud Reference Model, Architecture, Infrastructure / Hardware as a Service, Platform as a Service, Software as a Service, Types of Clouds, Public Clouds, Private Clouds, Hybrid Clouds, Community Clouds, Economics of the Cloud, Open Challenges, Cloud Interoperability and Standards, Scalability and Fault Tolerance.

Ready for the Cloud: Web Application Design, Machine Image Design, Privacy Design, Database Management, Data Security, Network Security, Host Security, Compromise Response.

UNIT 3

Defining the Clouds for Enterprise: Storage as a service, Database as a service, Process as a service, Information as a service, Integration as a service and Testing as a service.

Scaling a cloud infrastructure - Capacity Planning, Cloud Scale.

Disaster Recovery: Disaster Recovery Planning, Disasters in the Cloud, Disaster Management.

UNIT 4

Aneka: Cloud Application Platform Framework Overview, Anatomy of the Aneka Container, From the Ground Up: Platform Abstraction Layer, FabricServices, FoundationServices, ApplicationServices, Building Aneka Clouds, InfrastructureOrganization, LogicalOrganization, Private Cloud Deployment Mode, Public Cloud Deployment Mode,Hybrid Cloud Deployment Mode, Cloud Programming and Management,Aneka SDK, Management Tools.

UNIT 5

Cloud Applications: Scientific Applications – Health care, Geoscience and Biology. Business and Consumer Applications- CRM and ERP, Social Networking, Media Applications and Multiplayer Online Gaming.

Cloud Platforms in Industry: Amazon Web Services- Compute Services, Storage Services, Communication Services and Additional Services. Google AppEngine-Architecture and Core Concepts, Application Life-Cycle, cost model. Microsoft Azure- Azure Core Concepts, SQL Azure.

Learning Resource

Text Books

1. Mastering Cloud Computing by Rajkumar Buyya, Christian Vecchiola, S.Thamarai Selvi from TMH 2013.
2. George Reese Cloud Application Architectures, First Edition, O'Reilly Media 2009.

References

1. Cloud Computing and SOA Convergence in Your Enterprise *A Step-by-Step Guide* by David S. Linthicum from Pearson 2010.
2. Cloud Computing 2nd Edition by Dr. Kumar Saurabh from Wiley India 2012.
3. Cloud Computing – web based Applications that change the way you work and collaborate Online – Micheal Miller.Pearson Education.