CSE567:CLOUD COMPUTING PARADIGMS

L:3 T:0 P:0 Credits:3

Course Outcomes: Through this course students should be able to

CO1 :: classify the key concepts of Cloud Computing, its types and various Deployment Models

CO2 :: understand the key concepts of Cloud Computing, its types and various Deployment Models

CO3 :: analyze the Cloud Computing Architecture, Reference Model and its Handling, Failure Management

CO4 :: illustrate Cloud Computing Security Threats, Risks and Risk Management

CO5 :: understand details of Private Cloud Computing Platforms, Cloud Testing and Simulation process

CO6 :: identify industry used Cloud Platforms, their Applications and trending technologies in Cloud Computing

Unit I

Understanding Cloud Computing : Origins and Influences, Cluster Computing, Grid Computing, Utility Computing, Distributed Computing, Cloud Computing, Basic Concepts and Terminologies, Vision of Cloud Computing, Goal and Benefits, Risks and Challenges

Fundamental Concepts and Models : Roles and Boundaries, Cloud Characteristics, Cloud Delivery Models, IaaS, PaaS, SaaS, Combining Cloud Delivery Models, Cloud Deployment Models

Unit II

Cloud Enabling Technology : Broadband Networks and ISPs, Internet Architecture, Data Centre Technology, Virtualization Technology, Understanding type 1 and type 2 Hypervisor, Types of Virtualization, Benefits of Virtualization, Web Technology, Multi-tenant Technology, Service Technology.

Using the Mobile Cloud : Defining the Mobile Market, Using Smartphones with Cloud, Mobile Interoperability, Mobile location awareness

Unit III

Cloud Computing Architecture : Cloud Reference Model, Workload Distribution, Resource Pooling, Dynamic Scalability, Elastic Resource Capacity, Service Load Balancing, Cloud bursting, Elastic Disk Provisioning, Redundant Storage, Load Balancing Virtual Server Instances, Zero Downtime, Cloud Balancing, Dynamic Failure Detection and Recovery Mechanism, Rapid Provisioning, Load Balanced Virtual Switches

Unit IV

Cloud Security : Basic Terms and Concepts, Threat Agents, Cloud Security Threats, Cloud Risk Division and Risk Management, Cloud Security Architecture, VM Security Challenges, Vulnerability Assessment Tools, Open Source Security Solution Products in Cloud

Unit V

Private Cloud Computing Platforms and Cloud Testing : Introduction to OpenStack and Components of OpenStack, Vmware vClient, TPlatform, Apache Virtual Computing Lab, Enomaly Elastic Computing Platform, CloudStack, Amazon Virtual Private Cloud, Cloud Optimized Linux, Testing in Cloud Computing

cloud Simulation Tools : CloudSim, GreenCloud Simulator, iCan Cloud

Unit VI

Cloud Platform in Industry : Amazon Web Services- Compute Services, Storage Services, Database Services, Communication Services, Additional Services, Google App Engine- Architecture and Core Concepts, Application Life Cycle, Cost Model, Microsoft Azure Core Concepts, SQL Azure

Cloud Applications : Scientific Applications- Healthcare, Biology, Geoscience, Business and Consumer Applications- CRM and ERP, Social Networking, Media Applications, Multiplayer Online Gaming, Cloud Analytics, Cloud Content Delivery Network (CDN) Services

Advance Topics in Cloud : Containers, Edge Computing, Fog Computing, Energy Efficiency in Cloud, Federated Cloud Computing, Green Cloud Computing, Mobile Cloud Computing, Basics of IoT, Big Data Analytics

Text Books:

Text Books:

1. CLOUD COMPUTING: CONCEPTS, TECHNOLOGY & ARCHITECTURE by THOMAS ERLRICARDO PUTTINIZAIGHAM MAHMOOD, PEARSON

References:

1. MASTERING CLOUD COMPUTING by RAJ KUMAR BUYYA, CHRISTIAN VECCHIOLA, S. THAMARAI SELVI, MC GRAW HILL

2. CLOUD COMPUTING: FUNDAMENTALS, INDUSTRY APPROACH AND TRENDS by RISHABH SHARMA, WILEY