CAP470:CLOUD COMPUTING

Course Outcomes: Through this course students should be able to

CO1 :: Describe the fundamental ideas behind Cloud Computing, the evolution of the paradigm, its applicability; benefits, as well as current and future challenges.

CO2 :: Understand the basic ideas and principles in data center design; cloud management techniques and cloud software deployment considerations.

CO3 :: Apply the different CPU, memory and I/O virtualization techniques that serve in offering software, computation and storage services on the cloud.

CO4 :: Analyze the fundamental concepts of cloud storage and demonstrate their use in storage systems such as GFS and HDFS.

CO5 :: Evaluate various cloud programming models and apply them to solve problems on the cloud.

Unit I

Introduction to cloud computing : cloud overview, definition of cloud computing, evolution of cloud computing, components of cloud computing, characteristics of cloud computing, issues of cloud computing, advantage and disadvantages, applications of cloud computing

Unit II

Cloud computing architecture : service models: infrastructure as a service (IaaS), platform as a service (PaaS), software as a service (SaaS), deployment models: public cloud, private cloud, hybrid cloud, community cloud, business models: NIST cloud computing reference model. cloud cube model

Unit III

Cloud virtualization : virtualization, traditional vs virtualization architecture, need of virtualization, virtualization environments, components of virtualization, characteristics of virtualization, taxonomy of virtualization, hypervisor, types of hypervisor, virtual machine manager, hardware assisted virtualization, operating system level virtualization, process/programming language level virtualization, application-level virtualization, advantage and disadvantages of virtualization, Xen, VMware, Microsoft Hyper-V

Unit IV

Cloud access, cloud storage and file systems : platforms, web applications, web API's, web browser, storage as a service (StaaS), cloud storage providers, big data, introduction to MapReduce, hadoop framework, google file system (GFS), hadoop distributed file system (HDFS)

Unit V

Cloud security and standards : cloud security challenges, authorization, authentication, identify & access management, data security, data integrity, encryption & key management, open cloud consortium (OCC), distributed management task force (DMTF), standards for application developers, standards for messaging, standards for security

Unit VI

Cloud application design and collaboration : cloud application design considerations, cloud application reference architectures, design methodologies, data storage, data analytics, deployment & management, calendars, schedules and task management, project management, web- based communication tools

Text Books:

1. CLOUD COMPUTING, A PRACTICAL APPROACH by TOBY VELTE, ANTHONY VELTE, ROBERT ELSENPETER, Mc Graw Hill Education

References:

1. CLOUD COMPUTING: CONCEPTS, TECHNOLOGY & ARCHITECTURE by THOMAS ERL, Pearson Education India

2. CLOUD COMPUTING BIBLE by BARRIE SOSINSKY, WILEY