**Unit 1**

**Virtualization Techniques**: virtualization technology, overview of x86 virtualization, types of virtualizations, concept of VLAN, SLAN and VSAN and benefits

**Overview of Distributed Computing**: parallel and distributed systems, parallel computing, parallel computer architecture, distributed systems, differences, and similarities among different types of computing

**Unit 2**

**Introduction to Cloud Computing**: cloud computing in a nutshell, roots of cloud computing, layers and types of clouds, desired features of a clouds, cloud infrastructure management, examining the characteristics of cloud computing, cloud types.

**Migrating into a Cloud**: broad approaches to migrating into the cloud, the seven-step model of migration into a cloud VM migration, cloud middleware and best practices, concept and need of cloud middleware, QoS issues in cloud, data migration and streaming in cloud, interoperability.

**Unit 3**

**Understanding cloud architecture**: exploring the cloud computing stack, workload distribution architecture, capacity planning, cloud bursting architecture, disk provisioning architecture, dynamic failure detection and recovery architecture, cloud computing architecture, service level agreements, service-oriented architecture

**Unit 4**

**Cloud Computing Technologies and Applications:** cloud content delivery network services, multi-CDN, features of meta CDN, mobile cloud computing, intercloud issues, machine learning in the cloud, benefits, and limitations of machine learning in the cloud, types of cloud-based machine learning services, AIaaS, GPUaaS, key benefits and applications of using GaaS, parameters for selecting cloud GPU providers.

**Cloud Economics:** developing an economic strategy, exploring the costs, laws of cloudonomics, cost estimation, economics of cloud.

**Unit 5**

**Cloud Security:** cloud security fundamentals, cloud risk, cloud risk division, policy and organizational risks, technical risks, other risks, cloud computing security architecture, VM security challenges

**Cloud Database:** operational model for cloud database, types of cloud database, cloud file system, distributed file system basics, concept of GFS and HDFS, comparison of features

**Unit 6**

**Container Technology:** introduction to containers, container architectures, docker containers, Kubernetes

**Cloud Platforms in Industry:** Amazon Web Services, Google App Engine, Microsoft Azure, case studies

**Other Aspects of Cloud:** edge computing, fog computing, IIoT, green cloud computing practices, complexity in cloud-native systems.