Introduction to Cloud Computing

Course Title: Introduction to Cloud Computing   **Full Marks:** 60 + 20 + 20
Course No: CSC467   **Pass Marks:** 24 + 8 + 8
Nature of the Course: Theory + Lab   **Credit Hrs:** 3
Semester: VIII

Course Description:
This course covers different concepts of cloud computing including introduction, architectures, cloud virtualization, programming models, security, and platforms and applications of cloud computing.

Course Objectives:
The main objective of this course is to provide theoretical as well as practical knowledge of cloud computing including designing, implementing and managing the cloud computing.

Course Contents:
Unit 1: Introduction to Cloud Computing (6 Hrs.)
Evolution of Cloud Computing, Characteristics of Cloud Computing, Types of cloud and its Cloud services, Benefits and challenges of cloud computing, Applications cloud computing, Cloud Storage, Cloud services requirements, cloud and dynamic infrastructure, Cloud adoption

Unit 2: Cloud Computing Architecture (6 Hrs.)
Platform as service, Software as a service, Infrastructure as service, Public clouds, Private clouds, Community cloud, Hybrid clouds, Cloud design and implementation using SOA, security, trust and privacy

Unit 3: Cloud Virtualization technology (10 Hrs.)
Introduction to Virtualization, different types of Virtualization, Implementation Levels of Virtualization Structures, Benefits of virtualization, server virtualization, virtualization software, Types of Hypervisor, and Load balancing, Infrastructure requirement for virtualization

Unit 4: Cloud Programming Models (12 Hrs.)
Thread programming, Task programming, Map-reduce programming, Parallel efficiency of Map-Reduce, Enterprise batch processing using Map-Reduce, Comparisons between Thread, Task and Map reduce

Unit 5: Cloud security (6 Hrs.)
Cloud Security issues, challenges and Risks, Software-as-a-Service Security, Security Monitoring, Security Architecture Design, Data and application Security, Virtual Machine Security, Legal issues and Aspects, Multi-tenancy issues

Unit 6: Cloud Platforms and Applications (12 Hrs.)
Web services, AppEngine, Azures Platform, Aneka, Open challenges, Scientific applications, Business and Consumer applications

Laboratory Works:
The practical work consists of all features of cloud computing.

Text Books:
1. Dr. Kumar Saurabh, Cloud Computing
2. Raj Kumar Buyya, Christian Vecchiola, S. Thamarai Selvi, Mastering Cloud Computing

Reference Books:
1. David S. Linthicum, Cloud Computing and SOA Convergence in your enterprise
2.   Barrie Sosinsky, Cloud Computing Bible
3. Saurabh, K. (2011). Cloud Computing – Insights into New -Era Infrastructure, Wiley India.