NIRMA UNIVERSITY
Institute of Technology
B. Tech. Computer Science and Engineering
Open Elective (open to all branches except Dept. of CSE)

L	T	P	C
3	0	0	3

Course Code	2CSOE02
Course Title	Cloud Computing

Course Outcomes:

At the end of the course, students will be able to -

1. understand the hardware, software concepts and architecture of cloud computing
2. contrast the key technical and commercial issues concerning cloud computing versus traditional software models
3. realize the importance of virtualization technology in support of cloud computing
4. explore the issues related to cloud computing.

Syllabus

Teaching Hours

Unit I **08**

Cloud Fundamentals: Introduction and understanding of cloud computing, concepts and models, Cloud enabling technologies and fundamental cloud security and requirements, virtual machines and virtualization of clusters and data centres, Applications of Virtual Machines, Nested Virtualization. Services of cloud and its deployment model

Unit II **10**

Cloud Computing Mechanisms: Cloud Infrastructure,, Logical Network Perimeter, Virtual Server, Cloud Storage Device, Cloud Usage Monitor, Specialized Cloud Mechanisms, Load Balancer, SLA Monitor, Failover System, Hypervisor, Automated Scaling Cloud Management Mechanisms, Resource Management System, SLA Management System, Cloud Security Mechanisms, CASE STUDY examples.

Unit III **12**

Cloud Computing design and Architecting: Fundamental cloud architecture, Dynamic Scalability Architecture, Elastic Resource Capacity Architecture, Service Load Balancing Architecture, Cloud Bursting Architecture, advanced cloud architecture, Zero Downtime Architecture, Resource Reservation Architecture, Dynamic Failure Detection and Recovery Architecture, Storage Workload Management Architecture specialized cloud architecture, Elastic Network Capacity Architecture, Multipath Resource Access Architecture.

Unit IV **09**

Working with cloud: Cloud delivery model consideration, Business cost metrics, cost metrics and pricing models, Business cost metrics, Cloud usages cost metrics, Cloud service usages service quality metrics and SLAs, service quality metrics, CASE STUDY examples

Unit V **06**

Achieving production readiness for cloud services: Industry Standards Organizations, Mapping Mechanisms to Characteristics, Cloud-Adapted Risk Management Framework, Cloud Business Case Template

Self-Study:

The self study contents will be declared at the commencement of semester. Around 10% of the questions will be asked from self study contents.

Suggested Readings^:

1. RajkumarBuyya, James Broberg,Andrzej M Goscinski, Cloud Computing: Principles and Paradigms, Wiley publication
2. Thomas Erl, Zaigham Mahmood, and Ricardo Puttini, Cloud Computing Concepts, Technology & Architecture, PRENTICE HALL
3. Toby Velte, Anthony Velte, Cloud Computing: A Practical Approach, McGraw-Hill Osborne Media
4. George Reese, Cloud Application Architectures: Building Applications and Infrastructure in the Cloud, O'Reilly Publication
5. John Rhoton, Cloud Computing Explained: Implementation Handbook for Enterprises, Recursive Press
6. RajkumarBuyya, Christian Vecchiola, S. ThamaraiSelvi, Mastering Cloud Computing Foundations and Applications Programming, McGraw Hill

L=Lecture, T=Tutorial, P=Practical, C=Credit

^this is not an exhaustive list