

Devi Ahilya University, Indore, India Institute of Engineering & Technology			BE IV Year Computer Engineering (Semester – A)				
Subject Code : CER7C2	Instructions Hours per Week			Credits			
Subject Name: Cloud Computing	L	T	P	L	T	P	Total
Duration of Theory Paper: 3 Hours							

Course Objective:

To study the latest Computing Technologies of Computer Engineering.

Cloud Computing

Unit-I: Introduction to Cloud Computing

Cloud computing introduction and overview, history, characteristics of cloud, service and deployment models, Role of virtualization in enabling the cloud, Applications, providers of IaaS, PaaS and SaaS; challenges, advantages and disadvantages, Issues, SOA Programming model, Cloud based OS, deployment tools, cloud as green computing model.

Unit –II: Virtualization

Introduction to virtualization, characteristics, virtualization at infrastructure level, CPU virtualization, storage virtualization, network virtualization, Hypervisors, SAN, VLAN, Server virtualization, data center challenges and solutions, scaling a cloud infrastructure.

Unit-III : Service management in cloud

Service monitoring, load balancing, database recovery, backup management, virtual machine management, SLA. Migration of virtual Machines and techniques, different types of management issues.

Unit-IV: Issues and challenges in cloud

Various issues in cloud, cloud security services, secure cloud software requirements, cloud security challenges, network security, virtual machine security, threads.

Unit-V: Using mobile cloud

Working with mobile devices, cloud services applied in smartphone, mobile web services, performance synchronization, Defining WAP & other protocols, Fog computing.
Case study: google app engine, amazon open stack, Aneka, Microsoft Azure.

Recommended Books:

- 1) *Rajkumar Buyya; Cloud Computing Principles and Paradigms; John Wiley & Sons 2011.*
- 2) *Rajkumar Buyya; Mastering Cloud Computing; Elsevier Inc 2013.*
- 3) *Cloud Computing Bible, Barrie Sosinsky, Wiley-India, 2010*
- 4) *Toby Velte, Anthony Velte, Robert Elsenpeter, “Cloud Computing, A Practical Approach” McGraw-Hill Osborne Media; 1 edition [ISBN: 0071626948], 2009.*

IIT NPTEL links:

- https://www.youtube.com/watch?v=ZHCtVZ6cjdg&list=PLmmuEIIzy1cbwIMvGF1EsV4ZtAe8vA_7I (Prof S K Ghosh)
- <https://www.youtube.com/watch?v=NzZXz3fJf6o&list=PLShJJCRzJWxhz7SfG4hpaBD5bKOloWx9J>

List of practical's

1. Implementation of virtualization using VMware or VirtualBox.
2. Configuration of virtual machine for Storage unit, NIC, Processors and Memory.
3. Configuration of Hardware and software services of virtual machine
4. Configure IaaS, PaaS and SaaS for users.
5. Add new cloud services for local machine.
6. Design and deploy new web services for cloud users.
7. Manage user account and services in cloud.
8. Manage cloud database for remote users.
9. For the cloud users: Create, Update, delete, and modify the database for services.
10. Develop new services for cloud automation like: service update, upload data, backup.
11. Configure and manage the cloud for automatic data recovery and backup.
12. Working With Goggles APP engine and Amazon AWS services.
13. Identify and analyze the principal issues in troubleshooting virtual environments.
14. Performance evaluations and critical evaluations of a small scale virtual environment.
15. Case Study: PaaS (Face book, Google App Engine), SaaS (Desktop Apps) .
16. Case Study: NoSQL databases, MapReduce.