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|-----------------------|-------------------------------------------------|
| <b>Branch Name:</b>   | Computer Engineering / Information Technology   |
| <b>Semester/Year:</b> | Semester VIII / Final Year                      |
| <b>Subject Title:</b> | Cloud Infrastructure and Services (Elective-IV) |
| <b>Subject Code:</b>  | 1ET1030804                                      |
| <b>Pre-requisite:</b> | -                                               |

**Course Objective:**

- To understand Cloud Computing Fundamentals.
- To understand Virtualization, Load Balancing and Security Concepts in Cloud Computing.
- To understand Tools and Programming concept of Cloud architecture using Simulation.

| Teaching Scheme<br>(Hours per week) |                 |                  |        | Evaluation Scheme (Marks) |                          |                          |                          |                  |
|-------------------------------------|-----------------|------------------|--------|---------------------------|--------------------------|--------------------------|--------------------------|------------------|
| Lecture<br>(L)                      | Tutorial<br>(T) | Practical<br>(P) | Credit | Theory (Marks)            |                          | Practical (Marks)        |                          | Total<br>(Marks) |
|                                     |                 |                  |        | University<br>Assessment  | Continuous<br>Assessment | University<br>Assessment | Continuous<br>Assessment |                  |
| 03                                  | -               | 02               | 04     | 70                        | 30                       | 30                       | 20                       | 150              |

| Subject Contents |                                                                                                                                                                                                                                                  |                |                  |  |
|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|------------------|--|
| Sr.<br>No        | Topic                                                                                                                                                                                                                                            | Total<br>Hours | Weightage<br>(%) |  |
| 1                | <b>Introduction:</b><br>Server Computing, Peer-to-Peer Computing, Distributed Computing, Cloud Basic Concept, Benefits and Architecture, Deployment Models, Services, Overview of Security Issues                                                | 03             | 10               |  |
| 2                | <b>Virtualization and AWS Concepts:</b><br>Virtualization Concepts: Hardware, Software, Operating System, Storage Hypervisor, Mobility, Load Balancing, Advance Load Balancing, Machine Imaging<br>AWS : Architecture, Services, Business system | 06             | 20               |  |
| 3                | <b>Resources and Security management in AWS:</b><br>Understanding credentials for Users, groups , Security policies, IAM abilities and limitations, physical security, Cryptosystem Mechanism, Cloud Trail, Cloud Watch                          | 05             | 15               |  |
| 4                | <b>AWS Services Administration and Data Handling:</b><br>Basic Understanding APIs - AWS programming interfaces, Web services, Elastic block store - Simple storage service, Glacier                                                              | 05             | 20               |  |
| 5                | <b>AWS Computing:</b><br>Elastic cloud compute, Imaging computers, Auto scaling, Elastic load balancing                                                                                                                                          | 03             | 10               |  |

|   |                                                                                                                                           |    |    |
|---|-------------------------------------------------------------------------------------------------------------------------------------------|----|----|
| 6 | <b>Data and Networking with AWS:</b><br>Relational database service – DynamoDB, DNS servers, ElastiCache, Redshift, Virtual Private Cloud | 05 | 15 |
| 7 | <b>Open Source and Commercial Clouds, Cloud Simulator:</b><br>CloudSim, CloudAnalyst, GreenCloud, iCanCloud                               | 04 | 05 |
| 8 | Latest trend in Cloud Computing : Fog Computing, Dew Computing                                                                            | 03 | 05 |

### Course Outcome:

After learning the course, the students will be able to understand How Cloud Computing Technology works what are effective business models then run Cloud Industry Etc. Student also aware about the virtualization concept, Security threats in Cloud and the simulation Tools available to work with Cloud environment.

### List of Reference Books:

1. Cloud Computing Bible. Barrie Sosinsky, John Wiley & Sons.
2. Rajkumar Buyya, Cloud Computing: Principles and Paradigms, John Wiley & Sons
3. Amazon Web Services For Dummies Bernard Golden
4. Cloud Computing Design Patterns by Thomas Erl, Prentice Hall

### List of Suggested titles of Experiments (If Any):

1. Explain Cloud Service Models With real time Examples
2. Explain various Deployment Models with real scenario.
3. Create an AMI for Hadoop and implementing short Hadoop programs on the Amazon Web Services platform.
4. Write a code to create datacenter, Host and VM in CloudSim simulator
5. Write and explain various methods available for Load balancing in Cloud.
6. Create a scenario that use Amazon S3 as storage on Cloud.
7. Create a Comparative study on various simulators available for Cloud.

### E-Resources (If any):

1. Cloud Sim, Cloud Analyst, Green Cloud (Simulator Sources)
2. <http://www.cloudbus.org/>
3. <https://aws.amazon.com/>
4. [https://www.cisco.com/c/dam/en\\_us/solutions/trends/iot/docs/computing-overview.pdf](https://www.cisco.com/c/dam/en_us/solutions/trends/iot/docs/computing-overview.pdf)
5. <https://opensourceforu.com/2016/11/best-open-source-cloud-computing-simulators/>
6. <https://www.softwaretestinghelp.com/cloud-computing-service-providers/>