

**Course Title: Cloud Computing (3 Cr.)**

**Course Code: CACS402**

**Year/Semester: IV/VII**

**Class Load: 6 Hrs. / Week (Theory: 3Hrs. Practical: 3 Hrs.)**

**Course Description**

This course offers detailed concept, applications, principles and implementation of cloud computing. It includes introduction, Cloud Computing Architecture, Cloud Virtualization, Cloud Programming Models, Cloud security and applications. It does not entirely focus on theoretical concept but also strongly focuses on practical skill based learning.

**Course objectives**

The general objectives of this course are to provide theoretical as well as practical knowledge of cloud computing to make students capable of designing, implementing and managing the issues of cloud computing in their personal as well professional life.

**Course Contents**

**Unit 1: Introduction to Cloud Computing [6 Hrs.]**

- 1.1 Overview of Cloud Computing
- 1.2 Evolution of Cloud Computing
- 1.3 Characteristics of Cloud Computing
- 1.4 Types of cloud and its Cloud services
- 1.5 Benefits and challenges of cloud computing
- 1.6 Applications cloud computing
- 1.7 Cloud Storage
- 1.8 Cloud services requirements,
- 1.9 cloud and dynamic infrastructure
- 1.10 Cloud adoption

**Unit 2: Cloud Computing Architecture [6 Hrs]**

- 2.1 Cloud reference model
  - 2.1.1 Platform as service
  - 2.1.2 Software as a service
  - 2.1.3 Infrastructure as service
- 2.2 Cloud deployment models
  - 2.2.1 Public clouds
  - 2.2.2 Private clouds
  - 2.2.3 Community cloud
  - 2.2.4 Hybrid clouds
- 2.3 Cloud design and implementation using SOA,
- 2.4 security, trust and privacy

**Unit 3: Cloud Virtualization technology [10 Hrs]**

- 3.1 Overview of Virtualization techniques
- 3.2 Types of Virtualization
- 3.3 Implementation Levels of Virtualization Structures
- 3.4 virtualization benefits

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- 3.5 server virtualization
- 3.6 hypervisor management software
- 3.7 virtual infrastructure requirements

#### **Unit 4: MapReduce(8 Hrs)**

- 4.1 Introduction to parallel computing
- 4.2 Map-reduce model
- 4.3 Applications of map reduce
- 4.4 Parallel efficiency of Map-Reduce
- 4.5. MapReduce infrastructure

#### **Unit 5: Cloud security [6 Hrs]**

- 5.1 Introduction to Security,
- 5.2 Cloud Security challenges and Risks,
- 5.3 Software-as-a-Service Security
- 5.4 Security Monitoring
- 5.5 Security Architecture Design
- 5.6 Data Security
- 5.7 Application Security
- 5.8 Virtual Machine Security
- 5.9 Identity Management and Access Control

#### **Unit 6: Cloud platforms and applications [12 Hrs]**

- 6.1 Web services
- 6.2 AppEngine
- 6.3 Azures Platform
- 6.4 Aneka
- 6.4 Open challenges
- 6.5 Scientific applications
- 6.6 Business and Consumer applications

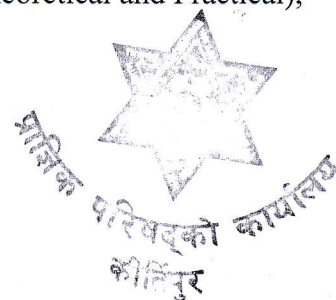
#### **Practical Works**

1. The practical work consists of all features of cloud computing and field visit.
2. Visit the cloud service provider (cloud industries) nearby you and prepare a report based on organizational structure and technology implemented consulting with your subject teacher.

#### **Teaching Methods**

The teaching faculties are expected to create environment where students can update and upgrade themselves with the current scenario of computing and information technology with the help of topics listed in the syllabus. The general teaching pedagogy that can be followed by teaching faculties for this course includes class lectures, laboratory activity, group discussions, case studies, guest lectures, research work, project work, assignments (Theoretical and Practical), and written and verbal examinations.

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## Evaluation

| Examination Scheme  |             |                     |           |       |
|---------------------|-------------|---------------------|-----------|-------|
| Internal Assessment |             | External Assessment |           | Total |
| Theory              | Practical   | Theory              | Practical |       |
| 20                  | 20 (3 Hrs.) | 60 (3 Hrs.)         | -         |       |

## Text Books

1. Dr. Kumar Saurabh, Cloud Computing
2. Raj Kumar Buyya, Christian Vecchiola, S. ThamaraiSelvi, 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.

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