# PARUL UNIVERSITY - Faculty of IT & Computer Science

**Department of Computer Application**

**SYLLABUS FOR 2nd Sem M.Sc. (IT), MCA (A.Y.-II) 2020 PROGRAMME**

**Cloud Computing - I (05201289)**

**Type of Course:** M.Sc. (IT), MCA (A.Y.-II) 2020

**Prerequisite:** Fundamental knowledge of Networking and Computing, Basic Knowledge of Web Services

**Rationale:** The key objectives of this course are to provide an understanding of the basic concepts of parallel and distributed computing and their role in cloud computing, to study the concept of virtualization and relevant technologies available in the market, to understand the importance of cloud computing for higher throughput, to make aware about availability of various cloud platforms, to study different application of cloud and cloud management techniques.

**Teaching and Examination Scheme:**

| Teaching Scheme | | | Credit | Examination Scheme | | | | | Total |
|---|---|---|---|---|---|---|---|---|---|
| | | | | External | | Internal | | | |
| Lect Hrs/ Week | Tut Hrs/ Week | Lab Hrs/ Week | | T | P | T | CE | P | |
| 3 | 1 | 2 | 5 | 60 | 30 | 20 | 20 | 20 | 150 |

**Lect** - Lecture, **Tut** - Tutorial, **Lab** - Lab, **T** - Theory, **P** - Practical, **CE** - CE, **T** - Theory, **P** - Practical

**Contents:**

| Sr. | Topic | Weightage | Teaching Hrs. |
|---|---|---|---|
| 1 | **Introduction**:<br><br>Cloud computing introduction, history, characteristics, Pros and cons of cloud computing, Nature of cloud, Technologies in cloud computing, Migrating into the cloud, Cloud applications Working of cloud computing, Trends in cloud computing. | 15% | 8 |
| 2 | **Cloud Computing Models**:<br><br>Types of Cloud, Cloud service models, Cloud deployment models, Cloud Service models - Software as a Service (SaaS), Platform as a Service (PaaS), Infrastructure as a Service (IaaS), Other cloud services, Cloud architecture, Cloud computing reference model. | 15% | 8 |
| 3 | **Virtualization Concepts**:<br><br>Virtualization - definition, architecture, software, applications, Virtual clustering, Anatomy of cloud infrastructure, Virtual infrastructures, CPU virtualization, Network and storage virtualization. | 15% | 8 |
| 4 | **Cloud Storage**:<br><br>Data Storage - Introduction to cloud data storage, Storage options in Cloud, Structured and Unstructured Storage in the Cloud, Exploring and Cloud Storage Services, data storage management, Cloud data stores, Provisioning cloud storage, Data-intensive technologies for cloud computing, Cloud storage from LANs to WANs - cloud characteristic, distributed data storage, applications utilizing cloud storage. | 15% | 8 |

| | | | |
|---|---|---|---|
| 5 | **Cloud Risks and Cloud Security**:<br><br>Risks in cloud computing - introduction, risk management, cloud impact, enterprise wide risk management, types of risks in cloud.<br><br>Data security in cloud - Introduction to Cloud Security, digital persona and data security, content level security, Understanding the shared security model<br><br>Cloud security services, Understand authentication and security authorization, challenges in the cloud, Secure cloud - software requirements, software testing. | 20% | 8 |
| 6 | **Google Cloud Platform (GCP)**:<br><br>The GCP console, Understanding GCP Projects, Install and Configure Cloud SDK, Use Cloud Shell, GCP APIs, Cloud Console Mobile App, Use GCP to build your Apps: Compute Options in the Cloud Exploring IaaS with Compute Engine [With Lab], Configuring Elastic Apps with Autoscaling. | 20% | 8 |

***Continuous Evaluation:**

It consists of Assignments/Seminars/Presentations/Quizzes/Surprise Tests (Summative/MCQ) etc.

**Reference Books:**


1. Cloud Computing - A practical approach for learning and implementation
   A.Srinivasan and J.Suresh; Pearson Publications
2. Cloud Computing: A practical approach
   Anthony T. Vetle; TMH
3. Cloud Computing For Dummies
   Judith Hurwitz, Robin Bloor, Marcia Kaufman, Fern Halper; Wiley India Pvt Ltd
4. Cloud Computing: SaaS, PaaS, IaaS, Virtualization, Business Models, Mobile, Security and More
   Kris Jamsa; Jones & Bartlett Learning
5. Cloud Computing Bible
   Barrie Sosinsky; Wiley India Pvt Ltd


**Course Outcome:**

After Learning the course the students shall be able to:

• define cloud computing and its applications.
• describe role of virtualization in establishing cloud.
• understand principles and service models of cloud computing.
• familiarize with various cloud computing platforms.
• conceptualize cloud storage management and data security.
• identify feasible cloud platforms for solutions to be provided.
• deploy services and resources on cloud platforms.

**List of Practical:**

1. **Cloud Storage: Sign Up for a free account on two or more providers of your choice. Store any 10 files that are larger than 10 MB each in at least two providers of your choice.**

2. **Cloud Models: Create or Sign Up for PaaS, Saas and IaaS services on platform of your choice and upload at least one of your resource or application on each platform.**

3. **Para-Virtualization: Implement one VMs in LINUX/Windows using VM software on your local machine.**

4. **Start a Windows Virtual Machine on Google Compute Engine.**

5. **Start a LINUX Virtual Machine on Google Compute Engine.**

6. **Build a Docker Application on GCP. You can use Git Repository to build.**

7. **Develop, Build and Deploy a container Application On Google Compute Engine.**

8. **Explore GCP. Perform at least one Case Study on GCP services and prepare detailed report on your Case Study.**