SANKALCHAND PATEL UNIVERSITY
।। अथातो ज्ञानजिज्ञासा ।।

Ph. D. Program
(July-2020 batch)

Subject Code: 1RI3000102	Subject Title: Essentials of Disciplinary Research Subject-1 (Basics of Cloud Computing)
Pre-requisite Subject	- Basic knowledge of Computer Networks and Network protocol suits -Understanding of process and thread management

Objectives of course:

The objectives of the 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

Learning outcomes:

At the end of this course, the student would be able to

- Understand the principals of Cloud computing
- Understand the concepts of virtualization
- Aware about various services provided by Cloud Computing (SaaS, IaaS, HaaS etc…)
- Gain an exposure about various Cloud platforms available in the IT market

Teaching Scheme (Credit Distribution)				Evaluation Scheme (% Marks)	Total Marks
Lecture	Tutorial	Practical	Credit	Continuous (Internal) Assessment	
3	1	--	4	100%	100

Unit	Content	Lecture	Wt. (%)
1	**Overview of Distributed Computing:** Computing, Traditional Utilities, Computing Paradigm Evolution, cloud computing: A New Paradigm, Differences and Similarities Among different types of computing. **Introduction to Cloud Computing:** Definition, Central Ideas Behind Cloud Computing, Properties and Characteristics of Cloud Computing, Benefits of Cloud Computing, Cloud Service and Deployment Models, Cloud Architecture, Challenges with Cloud Computing, Cloud Supporting Services, Management and Administration of Cloud Services.	8	25
2	**Virtualization Techniques:** Virtualization Technology, Overview of X86 Virtualization, Types of virtualization, Virtualization products, Concept of VLAN and Benefits, Concept of SAN and Benefits, VM Migration, VM Consolidation and Management, Cloud Interoperability Standards. **SLA with Cloud Service Providers:** The concept of SLA, SLA Aspects and Requirements, Service Availability, Cloud Outages, Credit calculation for SLA Breaches	8	25

3	**Risk, consequences and costs for cloud computing:** Introducing Risks in cloud computing, Risk Assessment and Management, Security and compliance requirements for public cloud, Calculating total cost of ownership (TCO) for cloud computing, direct and indirect Cloud costs, Cost allocation in the cloud, Chargeback model for Allocation of Direct and indirect costs, Chargeback Methodology, cost, Billable Items, Atomic Unit, Pricing Model, Chargeback tools and solutions, maintaining Strategic Flexibility in a cloud.	8	25
4	**Application Architecture for cloud:** Cloud Application Requirement, Architecture for Traditional versus Cloud Applications, Assumptions for Traditional and Cloud Applications, Recommendation for cloud Application Architecture, Fundamental Requirements for cloud application Architecture, Relevance and Use of Client-server Architecture for cloud Applications, Addressing Cloud Application Performance and Scalability, Service Oriented Architecture (SOA) for cloud Applications	8	25

List of References:

1. Rishabh Sharma: Cloud Computing Fundamentals, Industry Approach and Trends: Wiley publication.
2. Kailash Jayaswal, Jagannath Kallakurchi, Donald J Houde, Dr. Devan Shah: Cloud Computing: Black Book Dreamtech Publications.
3. Rajkumar Buyya, Christian Vechhiola, S.Thamarai Selvi, “Mastering Cloud Computing “, McGraw Hill Education (India) Private Limited.

SANKALCHAND PATEL UNIVERSITY
।। अथातो ज्ञानजिज्ञासा ।।

Ph. D. Program
(July-2020 batch)

Subject Code: 1RI3000103	**Subject Title: Essentials of Disciplinary Research Subject-2 (Cloud Computing Tools & Techniques)**
Pre-requisite Subject	**- NONE -**

Objectives of course:

The objectives of the course are:

- To make aware about availability of various Cloud platforms
- To study different application of Cloud and Cloud management techniques
- To provide a generalized, and extensible simulation framework that enables seamless modeling, simulation, and experimentation of emerging Cloud computing infrastructures and application services.

Learning outcomes:

At the end of this course, the student would be able to

- Gain an exposure about Google App Engine for Java.
- Develop Web apps using Google App Engine Cloud PaaS.
- Develop framework through which students can experiment on emerging Cloud computing infrastructures and application services.

Teaching Scheme (Credit Distribution)				**Evaluation Scheme (% Marks)**	**Total Marks**
Lecture	**Tutorial**	**Practical**	**Credit**	**Continuous (Internal) Assessment**	**50**
---	**-**	**2**	**2**	**100%**	

Unit	Content	Wt. (%)
1	**Cloud Simulators:** CloudSim and GreenCloud Introduction to Simulator, understanding CloudSim simulator, CloudSim Architecture (User code, CloudSim, GridSim, SimJava) Understanding Working platform for CloudSim, Introduction to GreenCloud	25%
2	**Introduction to VMWare Simulator:** Basics of VMWare, advantages of VMware virtualization, using Vmware workstation, creating virtual machines-understanding virtual machines, create a new virtual machine on local host, cloning virtual machines, virtualize a physical machine, starting and stopping a virtual machine.	25%
3	**Introduction to Google App Engine**: The Runtime Environment, The Static file servers, The Data store, The Services, Google Accounts, Task Queues and croon jobs, Developer tools, Administration console.	25%
4	**Data Store Entities**: Entities, keys and Properties, Data Store API, Property values, Keys and Key Objects, Using Entities, **Persistence API:** Setting Up JPA, Entities and Keys, Entity Properties, Embedded Objects, Saving, Fetching, and Deleting Objects, Transactions in JPA, Queries and JPQL Relationships	25%

List of References:

1. Dan Sanderson: Programming Google App Engine: O'Reilly| Google Press: (ISBN-978-0-596-52272-8)
2. Cloud Computing: A practical approach by Anthony T. Vetle – Tata McGraw Hill Education Private Limited (2009)
3. Cloud computing a practical approach - Anthony T.Velte , Toby J. Velte Robert Elsenpeter, TATA McGraw- Hill , New Delhi – 2010
4. Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate Online - Michael Miller - Que 2008