SANKALCHAND PATEL UNIVERSITY
।। अथातो ज्ञानजिज्ञासा ।।

FACULTY OF COMPUTER SCIENCE
Master Of Computer Application (Sem-II)
In Effect from Academic Year 2023-24

Branch Name:	MCA
Program Code:	CS201
Course Name:	Cloud Computing
Course Code:	3CS2010206T
Pre-requisite Course:	-Basic knowledge of Computer Networks and Network protocol suits -Understanding of process and thread management

Course Objectives:

1. To provide an understanding of the basic concepts of parallel and distributed computing and their role in Cloud Computing.
2. To study the concept of Virtualization and relevant technologies available in the market
3. To understand the importance of Cloud computing for higher throughput
4. To make aware about availability of various Cloud platforms
5. To study different application of Cloud and Cloud management techniques

Teaching and Examination Scheme:

Teaching Scheme (Hours per week)				Evaluation Scheme (Marks)				
				Theory (Marks)		Practical (Marks)		
Lecture (L)	Tutorial (T)	Practical (P)	Credit	University Assessment	Continuous Assessment	University Assessment	Continuous Assessment	Total (Marks)
4	-	-	4	60	40	-	-	100

Subject Contents:

Unit No	Topic	Total Hours	Weightage (%)
1	**Overview of Distributed Computing**: Computing, Traditional Utilities, Creation of the Internet, computing Paradigm Trends, 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, Organizational Scenario of Cloud: Cloud Deployment Model, Cloud Architecture, Cloud Vocabulary, Challenges with Cloud Computing, Cloud Supporting Services, Management and Administration of Cloud Services. **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.	**12**	**25**
2	**SLA with Cloud Service Providers:** The concept of SLA, SLA Aspects and Requirements, Service Availability, Cloud Outages, Credit calculation for SLA Breaches, Sample SLA for Amazon, Rack space, Google, HP etc. **Risk, Consequences and costs for cloud computing:** Introducing Risks in cloud computing, Risk Assessment and Management, Risk of vendor lock-in, loss of control, not meeting regulatory compliance, resource scarcity or poor provisioning, Multi-tenant Environment, failure, supply chain, Inadequate SLA,	**11**	**25**

	malware and Internet attack, Management of Cloud Resources, Network Outage, Physical Infrastructure, Legal Risks due to Legislation, Risk with Software and Application Licensing, 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.		
3	**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 **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 **Creating an Application:** Setting the SDK, Developing an application, Registering the application, deploying the Application, Uploading the Application.	**12**	**25**
4	**Handling Web Requests:** The App Engine Architecture, Configuring the Frontend , How App Runs, Quotas and Limits **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	**11**	**25**

Text Books:

1. John W.Rittinghous, James F.Ransome, ―Cloud Computing: Implementation, Management and Security‖, CRC Press 2010.
2. Cloud Computing-A Practical Approach, Anthony T. Velte, Toby J. Velte, Robert Elsenpeter. McGrawHill.
3. Michael Miller, ―Cloud computing – Web based applications that change the way you work and collaborate online‖, Pearson Education Inc., 2008

Reference Books:

1. Rishabh Sharma: Cloud Computing Fundamentals, Industry Approach and Trends: Wiley Publication.(ISBN: 978-81-265-5306-8)
2. Kailash Jayaswal, Jagannath Kallakurchi, Donald J Houde, Dr. Deven Shah : Cloud Computing :Black Book Dreamtech Publications(ISBN 978-93-5119-418-7)
3. Dan Sanderson: Programming Google App Engine: O'Reilly| Google Press: (ISBN-978-0-596-52272-8)
4. Cloud Computing: A practical approach by Anthony T. Vetle – Tata McGraw Hill Education Private Limited (2009)
5. Rajkumar Buyya, Christian Vechhiola, S.Thamarai Selvi, "Mastering Cloud Computing ", McGraw Hill Education (India) Private Limited.

List of Open Source Software/learning website:

https://www.simplilearn.com/
https://aws.amazon.com/
https://www.javatpoint.com/cloud-computing-tutorial
https://www.coursera.org/learn/cloud-computing-basics

Course Learning Outcomes (CLO): On completion of this course, the students will be able to:

CLO	Description	Bloom'sTaxonomyLevel
CLO1	Understand the common terms and definitions of virtualization and cloud computing	2 Understanding
CLO2	Familiarize and apply Cloud deployment tools in real time applications	3 Applying,
CLO3	Describe the landscape of different types of virtualization	2 Understanding,
CLO4	Comprehend the technical capabilities and business benefits of virtualization and cloud computing.	3 Applying, 2 Understanding
CLO5	Implement different types of Virtualization technologies and Service Oriented Architecture systems	3 Applying,
CLO6	Choose among various cloud technologies for implementing applications	3 Applying,

Mapping of CLOs with POs & PSOs

Course Learning Outcomes	Program Outcomes (POs)												Program Specific Outcomes(PSOs)	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CLO1	**H**	**M**	**L**	M	L				L		M	**M**	**H**	**M**
CLO2	H	**L**	M	H	H				M		L	L	**L**	**M**
CLO3	M	L	L	M	**L**				L		M	L	**L**	**L**
CLO4	L	**M**	**M**	**M**	L				**M**		M	M	L	**M**
CLO5	M	**L**	**M**	**L**	L		L		**L**		M	L	**M**	**L**
CLO6	L	**M**	**L**	**M**	L				**M**		L	M	L	**M**

H:High, M:Medium, L:Low