



GUJARAT TECHNOLOGICAL UNIVERSITY

Syllabus for Master of Computer Applications, 3rdSemester

Subject Name: Cloud Computing

Subject Code: 639407

With effective
from academic
year 2020-21

1. Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks				Total Marks
L	T	P		C	Theory Marks		Practical Marks	
					ESE (E)	PA (M)	ESE (V)	PA (I)
3	-	2	4	70	30	30	20	150

2. Course Outcomes:

Course Outcome Component	Course Outcome (Learner will be able to)
CO1	<ul style="list-style-type: none"> Understand concepts of Cloud Computing
CO2	<ul style="list-style-type: none"> Understand virtualization techniques and Service Level Agreement
CO3	<ul style="list-style-type: none"> Estimate cost for Cloud Computing implementation
CO4	<ul style="list-style-type: none"> Understand and analyse architecture of cloud computing
CO5	<ul style="list-style-type: none"> Deploying application in cloud environment

3. **Course Duration:** The course duration is of 40 sessions of 60 minutes each.

4. Course Contents:

Unit No:	Contents	No. of Sessions	70 Marks (External Evaluation)
I	<ul style="list-style-type: none"> 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. 	6	10
II	<ul style="list-style-type: none"> 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 	6	10



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	SLA, SLA Aspects and Requirements, Service Availability, Cloud Outages, Credit calculation for SLA Breaches, Sample SLA for Amazon, Rackspace, Google, HP etc.		
III	<ul style="list-style-type: none"> • 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, In adequate SLA, 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, Charge back tools and solutions, maintaining Strategic Flexibility in a cloud. 	6	10
IV	<ul style="list-style-type: none"> • 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. 	6	10
V	<ul style="list-style-type: none"> • Introduction to Google App Engine: The Runtime Environment, The Static file servers, The Data store, The Services, Google Accounts, Task Queues and cron jobs, Developer tools, Administration console. • Creating an Application: Setting the SDK, Developing an application, registering the application, deploying the Application, and Uploading the Application. Handling Web Requests: The App Engine Architecture, Configuring the Front end, How App Runs, Quotas and Limits. 	8	15
VI	<ul style="list-style-type: none"> • 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. 	8	15



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5. Pedagogy:

- ICT enabled Classroom teaching
- Case study
- Practical / live assignment
- Interactive class room discussions

6. Evaluation:

Students shall be evaluated on the following components:

	Internal Evaluation	(Total - 20 Marks)
A	• Continuous Evaluation Component	10 marks
	• Class Presence & Participation	10 marks
B	Mid-Semester examination	(30 Marks)
C	End –Semester Examination(Theory)	(70 Marks)
D	End –Semester Examination(Practical/Viva)	(30 Marks)

7. Text Books:

No.	Author	Name of the Book	Publisher
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)

8. Reference Books:

No.	Author	Name of the Book	Publisher
1	Anthony T. Vetle	Cloud Computing: A practical approach	Tata McGraw Hill Education Private Limited (2009)
2	Rajkumar Buyya, Christian Vechhiola, S. ThamaraiSelvi	“Mastering Cloud Computing“	McGraw Hill Education(India) Private Limited.
3	Judith Hurwitz, Robin Bloor, Marcia Kaufman, Fern Halper	Cloud Computing For Dummies	Wiley India Pvt Ltd
4	Kris Jamsa	Cloud Computing: SaaS, PaaS, IaaS, Virtualization, Business Models, Mobile, Security and More (Student Edition)	Jones & Bartlett Learning

9. Suggestive Practical List:

1. Develop a hello world program web application and deploy it on the Google app engine.



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2. Develop a web application which displays the current date and time in a formatted way.
3. Develop a web application which is customized version of the practical no 2, which relates the clock with Google accounts. Each user will get different view based on the preferences and the user's time zone.
4. Develop a web application for task management. Create a form to enter summary, URL and description of task and a button to insert a task in the task list. Use JPA (Java Persistence API) for the persistence and Sends the selected todo to yourself via email as a reminder
5. Develop a simple Java web application for Google App Engine--a guestbook that lets users post messages to a public message board.
6. Create a book class as entity and make the object persistence using JPA. Demonstrate the saving, fetching and deleting objects operations.
7. Create an employee class as entity and makes the objects persistence using JPA. Demonstrate transaction processing in the data store using JPA.
8. JPA includes a SQL-like query language called JPQL, perform the practical no 6 with JPQL also.
9. Perform the practical no 7 with JPQL[list the employees having salary between a particular range]

Note: Internet connection is required for each practical except practical 1 and practical 2