SARVAJANIK UNIVERSITY
Sarvajanik College of Engineering and Technology
Masters of Computer Applications

MCA Semester II

Subject Name: Cloud Computing and DevOps **Subject Code:** MTCA13205

Type of course: Professional Core Course

Prerequisite (if any):

- Basic knowledge of networks, servers, storage, applications, and services, Understanding of process and thread management

List of Courses where this course will be prerequisite:

- Disaster Recovery
- Data Backup
- Big Data Analytics

Rationale: Knowledge of this course will be used in different areas like Infrastructure-as-a-Service (IaaS) and Platform-as-a-Service (PaaS) , Big Data Analytics, Cloud Storage, Disaster Recovery, Data backup

Teaching and Examination Scheme:

TEACHING SCHEME				Theory Marks			Practical Marks		Total
L	T	P	C	TEE	CA1	CA2	TEP	CA3	
2	1	0	3	60	25	15	0	0	100

CA1: Continuous Assessment (assignments/projects/open book tests/closed book tests **CA2:** Sincerity in attending classes/class tests/ timely submissions of assignments/self-learning attitude/solving advanced problems **TEE:** Term End Examination **TEP:** Term End Practical Exam (Performance and viva on practical skills learned in course) **CA3:** Regular submission of Lab work/Quality of work submitted/Active participation in lab sessions/viva on practical skills learned in course

Content:

Sr. No.	Content	Teaching Hrs.	Module 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.	7	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, Sample SLA for Amazon, Rackspace, Google, HP etc.	7	25%
3	**Risk, Consequences 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, 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.	5	13%

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	**4**	**12%**
5	**Introduction to DevOps :** Introduction to Devops, Why Devops?, DevOps Architecture, DevOps Workflow and Principles, DevOps Tools, DevOps Automation, Lean, ITIL, Important terminology ,Devops perspective, Devops and Agile	**7**	**25%**
6	**(For Tutorial/Practical Only)** Introduction to different tools used for Agile web Development, Introduction to AtlassianJira, add project and add task and subtask to create sprints with task.		
7	**(For Tutorial/Practical Only)** Introduction to Git, Introduction to Git repository and Git structure, adding code to Git, Creating and merging different Git branches. Docker Overview, Docker Architecture, Docker Client / Docker CLI, Docker Images, Docker Containers, Docker Registries, Dockerfile, Docker Compose, Containerize an application		

Suggested Specification table with Marks (Theory):

Distribution of Theory Marks					
R Level	U Level	A Level	N Level	E Level	C Level
20	20	0	15	15	15

Legends: R: Remembrance; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create and above Levels (Revised Bloom's Taxonomy)

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Reference Books:

Sr. No.	Title of book / Article	Author(s)	Publisher and details like ISBN	Year of publication	Publication Edition
1.	Cloud Computing Fundamentals, Industry Approach and Trends:	Rishabh Sharma	Wiley Publication. (ISBN: 978-81-265-5306-8)	2015	2nd Edition
2.	Cloud Computing :Black Book	Kailash Jayaswal, Jagannath Kallakurchi, Donald J Houde,Dr. Deven Shah	Dreamtech Publications (ISBN 978-93-5119-418-7)	2014	2nd Edition
3.	Cloud Computing: Principles and Paradigms	Rajkumar Buyya, James Broberg, Andrzej Goscinski	Wiley Publication. (ISBN-13 978-8126541256)	2013	1st Edition

Course Outcomes:

Sr. No.	CO Statement After learning this subject, students will be able to	Marks % weightage
CO-1	Understanding the basics of Distributed Computing, Cloud Computing and Deployment Models	25%
CO-2	Ability to understand the concepts of virtualization and the types of Virtualization Techniques	25%
CO-3	Understand the Risk and Consequences for Cloud Computing	13%
CO-4	Understand the application architecture for cloud	12%
CO-5	Gain an exposure about DevOps and develop web apps using DevOps	25%
CO-6	Understand Agile web development and develop task management usingatlassian Jira tool. .	
CO-7	Understand the repository and the structure of Git, Docker Architecture and its applications.	

Mapping with POs:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PS01	PS02	PS03
CO-1	3	1	0	0	0	0	0	0	0	0	0	3			
CO-2	3	1	0	0	0	3	2	2	3	2	3	3			
CO-3	3	3	0	2	3	3	3	3	2	1	0	3			
CO-4	3	3	0	1	2	0	0	0	2	0	0	3			
CO-5	3	3	0	1	3	0	0	0	1	2	2	3			
CO-6	3	3	0	1	3	0	0	0	1	2	2	3			
CO-7	3	3	0	1	3	0	0	0	1	2	2	3			
Rationale*															

Rationale*: Explaining why it is matching this particular program outcome

List of Open learning website:

- https://www.tutorialspoint.com/cloud_computing/index.htm
- https://www.w3schools.in/cloud-computing/cloud-computing/
- https://www.tutorialspoint.com/cloud_computing/index.htm
- https://www.devopsschool.com/pdf/devops/index.htmlhttps://www.atlassian.com/software/jira
- https://resources.github.com/devops/

List of Open Source Software:
NA

FOR LAB SESSIONS:

NIL

List of Experiments:

NIL

Major Equipment Needed:

NA