SARVAJANIK UNIVERSITY
Sarvajanik College of Engineering and Technology
Bachelor of Technology

Year: B.Tech III (Semester – V)

Subject Name: Cloud Computing **Subject Code:** BTIT14502
Type of course: Professional Elective Course
Prerequisite (if any): Computer Networks, Operating Systems

Rationale: This course gives students an insight into the basics of cloud computing along with virtualization. Cloud computing is one of the fastest-growing domains for a while now. It will provide the students with Basic understanding of various cloud services and how one can migrate over it.

Teaching and Examination Scheme:

Teaching Scheme				Theory Marks			Practical Marks		Total
L	T	P	C	TEE	CA1	CA2	TEP	CA3	
3	0	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

Contents:

Sr. No.	Contents	Total Hrs
1	**Introduction to Cloud Computing :** Defining Cloud Computing, Roots of Cloud Computing, Distributed Computing, Grid Computing, Cluster Computing, Utility Computing, Cloud Computing, Hardware Virtualization, Cloud Types- Deployment models, Service models, Characteristics of Cloud Computing, Benefits, Disadvantages, Open Standards, Service Level Agreements	**06**
2	**Cloud Architecture:** Cloud Computing stack, Platforms, Virtual Appliances, Communication Protocols, Services and Applications by Type- Infrastructure as a Service(IaaS), Platform as a Service(PaaS), Software as a Service(SaaS), Identity as a Service (IDaaS), Compliance as a Service (CaaS), Managing the Cloud, Migrating into a Cloud Introduction, Challenges while migrating to Cloud, Broad approaches to migrating into the cloud-why migrate -deciding on cloud migration, the Seven-step model of migration into a cloud.	**08**
3	**Abstraction and Virtualization:** Virtualization technologies, Load balancing, The Google Cloud, Virtual Machine Monitor (VMM), Type 1 and Type 2 Hypervisors, VMware vSphere, Full virtualization - partial virtualization - paravirtualization, Desktop virtualization: Software virtualization, Memory virtualization - Storage virtualization – Data virtualization – Network virtualization	**08**

4	**Web Services:** Defining Services, SaaS versus PasS, PaaS Application Frameworks, Google Web Services: Google Application Portfolio, Google Toolkit, Google App Engine, Amazon Web Service (AWS) Components and Services, Elastic Compute Cloud (EC2), Amazon Storage Systems, Amazon Database Services, Microsoft Cloud Services-Windows Azure Platform	**10**
5	**Cloud Security:** Cloud Security Alliance (CSA), Security service boundary, Infrastructure Security-Network level security, Host level security, Application level security, Data security and Storage, Data privacy and security Issues, Jurisdictional issues raised by Data location, Identity & Access Management, Access Control, Trust, Reputation, Risk, Authentication in cloud computing, Client access in cloud, Cloud contracting Model, Commercial and business considerations	**05**
6	**Cloud-Based Storage service :** The unmanaged and managed cloud storage, Creating cloud storage systems, Virtual storage containers, Cloud Backup Solutions, Types, Cloud Storage Interoperability, Open Cloud Computing Interface (OCCI)	**04**
7	**Cloud Productivity Applications:** Online Office Systems- Acrobat.com, Glide Digital, Google Docs, Microsoft Office Web Apps, ThinkFree Office, Zoho Office Suite	**04**

Suggested Specification table with Marks (Theory): (For B. Tech only)

Distribution of Theory Marks					
R Level	**U Level**	**A Level**	**N Level**	**E Level**	**C Level**
15	15	10	0	0	0

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

Reference Books:

Sr no	**Title of book /article**	**Author(s)**	**Publisher and details like ISBN**
1	Cloud Computing Bible	Sosinsky B	Wiley India ISBN: 978-0-470-90356-8
2	Cloud Computing: Principles and Paradigms	Rajkumar Buyya	Wiley India Edition
3	Cloud Computing – A practical Approach	Velte T., Velte A., Elsenpeter R.,	Tata McGrawHill
4	Cloud Security -A Comprehensive Guide to Secure Cloud Computing	Ronald L. Krutz Russell Dean Vines	Wiley ISBN: 978-0- 470-58987-8

Note: Students should refer to the latest editions of books

Course Outcomes:

Sr. No.	CO statements	Marks % weightage
CO-1	To understand the principles and paradigm of Cloud Computing	15
CO-2	Formulate the Service Model with reference to Cloud Computing	30
CO-3	Demonstrate the role of Virtualization Technologies	20
CO-4	Understand cloud security issues and solutions	15
CO-5	Understand cloud storage and productivity applications	20

List of Open learning website:

- www.nptel.ac.in
- NITTR Instructional Resources Videos.