BOS	**Computer Science**
Class	**T.Y.B.Sc.C.S**
Semester	**VI**
Subject Name	**Cloud Computing**
Subject Code	**PUSCS602**
Level of the Subject	**Medium**

Course Objectives:

1. Computing concepts, technologies, architecture, implantations and applications.
2. To expose the learners to frontier areas of Cloud Computing, while providing sufficient foundations to enable further study and research.

Unit No.	Name of Unit	Topic No.	Content	No.of Lectures
1	Introduction to Cloud Computing	1.1	Introduction to Cloud Computing,Characteristics and benefits of Cloud Computing,	15
		1.2	Basic concepts of Distributed Systems, Web 2.0, Service-Oriented Computing, Utility-Oriented Computing	
		1.3	Elements of Parallel Computing, Elements of Distributed Computing. Technologies for Distributed Computing	
		1.4	Cloud Computing Architecture. The cloud reference model. Infrastructure as a service. Platform as a service. Software as a service	

2	Virtualization	2.1	Types of clouds, Characteristics of Virtualized Environments.	15
		2.2	Taxonomy of Virtualization Techniques, Virtualization and Cloud Computing.	
		2.3	Pros and Cons of Virtualization, Virtualization using KVM, Creating virtual machines	
3	Introduction to OpenStack	3.1	oVirt - management tool for virtualization environment. Open Challenges of Cloud Computing	15
		3.2	Introduction to OpenStack, OpenStack test-drive, Basic OpenStack operations,	
		3.3	OpenStack CLI and APIs, Tenant model operations, Quotas, Private cloud building blocks	
4	Cloud Security Mechanisms	4.1	Controller deployment, Networking deployment, Block Storage deployment, Compute deployment	15
		4.2	Deploying and utilizing OpenStack in production environments, Building a production environment, Application orchestration using OpenStack Heat	
		4.3	Cloud Security Mechanisms -Encryption, Hashing, Digital Signature, Public Key Infrastructure (PKI), Identity and Access Management (IAM), Single Sign-On (SSO), Cloud-Based Security Groups	
Total No of Lectures				**60**

Course Outcomes:

1. Understand the concepts, characteristics, delivery models and benefits of cloud computing
2. Understand the different characteristics of public, private and hybrid cloud deployment models including SaaS, PaaS, IaaS
3. Understanding virtualization and various ways of using virtualization
4. Implementation of private cloud platform using virtualization
5. Explore OpenStack architecture with both CLI and API functionalities
6. Understand the key security and compliance challenges of cloud computing

Reference Books :

1. Mastering Cloud Computing, RajkumarBuyya, Christian Vecchiola, S ThamaraiSelvi, Tata McGraw Hill Education Private Limited, 2013
2. OpenStack in Action, V. K. CODY BUMGARDNER, Manning Publications Co, 2016
3. OpenStack Essentials, Dan Radez, PACKT Publishing, 2015
4. OpenStack Operations Guide, Tom Fifield, Diane Fleming, Anne Gentle, Lorin Hochstein, Jonathan Proulx, Everett Toews, and Joe Topjian, O'Reilly Media, Inc., 2014
5. https://go.qwiklabs.com/hey-student?utm_source=gcp_edu&utm_medium=newsletter&ut m_campaign=ahef(add in theory and practical)

BOS	**Computer Science**
Class	**T.Y.B.Sc.C.S**
Semester	**VI**
Subject Name	**Cloud Computing**
Subject Code	**PUSCS607P**
Level of the Subject	**Medium**

Practical No	Details
1.	Study of Cloud Computing & Architecture
2.	Installation and Configuration of virtualization using KVM.
3.	Study and implementation of Infrastructure as a Service
4.	Study and implementation of Storage as a Service
5.	Study and implementation of identity management
6.	Study Cloud Security management
7.	Write a program for web feed.
8.	Study and implementation of Single-Sign-On.
9.	User Management in Cloud.
10.	Case study on Amazon EC2/Microsoft Azure/Google Cloud Platform