ITM(SLS) Baroda University
School of Computer Science, Engineering and Technology
B. Tech – Semester VII

Course Name: Cloud Computing and Applications
Course Code: C2710D5
Course Type: Elective

Teaching Scheme:

Teaching Scheme			Credits	Examination Marks				Total Marks
L	T	P	C	Theory Marks		Practical Marks		
4	0	2	5	External	Internal	External	Internal	
				40	60	0	50	150

Course Objective:
1. To provide students with the fundamentals and essentials of Cloud Computing.
2. To provide students a sound foundation of the Cloud computing so that they are able to start using and adopting Cloud Computing services and tools in their real-life scenarios.
3. To enable students exploring some important cloud computing driven commercial systems such as Google Apps, Microsoft Azure and Amazon Web Services and other businesses cloud applications.
4. To impart knowledge in applications of cloud computing

Course Learning Outcome:
After completing the course, the student shall be able to:

	Course Outcome	Bloom's Level
CO1	Design, Develop & Demonstrate real-world applications from the Cloud Computing	Design

CO2	Understand the subtle architectural difference in Public and Private Clouds.	Understanding
CO3	Appreciate the requirements of various service paradigms in Cloud Computing.	Understanding
CO4	Describe the methods of processing multimedia elements and other information presentation concepts during multimedia communications	Applying

Course Contents:

Unit #		**Teaching Hours**
1	**Introduction to Cloud Computing** Cloud Computing Overview: Characteristics – challenges, benefits, limitations, Evolution of Cloud Computing, Cloud computing architecture, Cloud Reference Model (NIST Architecture)	05
2	**Infrastructure as a Service** Service Model, Characteristics, Benefits, Enabling Technologies Case Study: AWS, OpenStack	05
3	**Platform as a Service** Service Model, Characteristics, Benefits, Enabling Technologies Case Studies: IBM Bluemix, GAE, Microsoft Azure	05
4	**Software as a Service** Service Model, Characteristics, Benefits, Enabling Technologies Case Study: Salesforce.com, CRM, Online Collaboration Services	05
5	**Data Analytics as a Service** Hadoop as a service, MapReduce on Cloud, Chubby locking Service	05
6	**Introduction to Public and Private Clouds** Shared Resources – Resource Pool – Usage and Administration Portal – Usage Monitor –Resource Management– Cloud Security – Workload Distribution – Dynamic provisioning.	05
7	**Storage as a service** Historical Perspective, Datacentre Components, Design Considerations, Power Calculations, Evolution of Data Centers, Cloud data storage – CloudTM	03

8	**Recent Trends**	02
	Total Hours:	**40**

Reference Books:

1) Kai Hwang, Geoffrey Fox, Jack J. Dongarra, Morgan Kaufmann, "Distributed and Cloud Computing: From Parallel Processing to the Internet of Things," 1st Edition, 2011.
2) Gautham Shroff, "Enterprise Cloud Computing: Technology, Architecture, Applications", Cambridge press, 2010.
3) Kris Jamsa, "Cloud Computing", Jones & Barlett Learning, 2013.
4) Rajkumar Buyya, James Broberg, Andrzej Goscinski, "Cloud Computing Principles and Paradigms", John Wiley & Sons, 2011.
5) John Rhoton and Risto Haukiojal, "Cloud Computing Architectured: Solution Design Handbook", Recursive Press, 2013.
6) George Recse, "Cloud Application Architectures: Building Application and Infrastructure in the Cloud" , O' Reilly Media, First Edition, 2009.
7) Dinkar Sitaram, Geetha Manjunathan, "Moving to the Cloud: Developing Apps in the new world of Cloud Computing", Syngress, 2012.
8) Samee. U. Khan, Albert. Y. Zomaya, "Handbook on Data Centers", Springer, 2015.

List of Open-Source Software/learning website:

1) https://www.analyticsvidhya.com/
2) Python Version 3.6 or higher : https://www.python.org/downloads/
3) Jupyter Notebook: https://jupyter.org/install

Lab Experiments:

1	Cisco simulator – VLAN design, Routing, Subnetting, Gateway configuration
2	Virtual box-based Web Server creation, Images/Snapshots access webpage from 2nd VM on another subnet work
3	EC2 AWS – S3 bucket based static web pages.
4	EC2 AWS – Instance Creation, Migration
5	EC2 AWS – Web application using Beanstalk.
6	AWS – Local balancing and auto scaling.