FR. Conceicao Rodrigues College Of Engineering

Father Agnel Ashram, Bandstand, Bandra-west, Mumbai-50

Department of Information Technology Engineering

B.E. (IT) (semester VII) (2018-2019)

Course Outcomes & Assessment Plan

Subject: Cloud Computing (CC-BEITC702)

Syllabus

Sr.No		
1	Introduction to Cloud Computing	Introduction – Component of CC – Comparing CC with Virtualization, Grids, Utility Computing, client-server model, P-to-P Computing – Impact of CC on Business – Key Drivers for Cloud Computing - Cloud computing Service delivery model - Cloud Types – Private, Public and Hybrid, when to avoid public cloud, Cloud API
2	Virtualization	Introduction & benefit of Virtualization – Implementation Levels of Virtualization- VMM Design Requirements and Providers – Virtualization at OS level – Middleware support for Virtualization – Virtualization structure/tools and mechanisms: Hypervisor and Xen Architecture, Binary Translation with full Virtualization, Para Virtualization with Compiler Support - Virtualization fo CPU, Memory and I/O Devices, Hardware support for Virtualization in intel x86 processor – CPU Virtualization – Memory Virtualization and I/O Virtualization – Virtualization in Multicore processors
3	Cloud computing Services	XaaS, IaaS, PaaS- Leveraging PaaS for Productivity- Languages for PaaS- DBaaS(Database as a services) – SaaS(Software as a service) – Comparison of various cloud computing providers/ Softwares.
4	Cloud Computing and Business Value	Key Business Drivers for CC- Cloud computing and out sourcing – Types of Scalability – Security issues in Cloud Computing- time to Market Benefits- Distribution over Internet – Three levels of Business value from Cloud computing
5	Open Source	Eucalyptus and Openstack Architecture Features –

FR. Conceicao Rodrigues College Of Engineering

Father Agnel Ashram, Bandstand, Bandra-west, Mumbai-50

Department of Information Technology Engineering

B.E. (IT) (semester VII) (2018-2019)

Course Outcomes & Assessment Plan

Subject: Cloud Computing (CC-BEITC702)

	Cloud Implementation and Administration	Components – Various mode of operations – Installation and configuration process of both open source – Cloud Administration and Management Task – Creating User Interface (Web Interface) of Private cloud.
6	Cloud Deployment Techniques	Factors for Successful Cloud Deployment – Network Requirements – Potential Problem areas in a cloud Network and their Mitigation – Cloud Network Topologies – Automation and Self-service feature in a cloud –cloud performance.
7	Security	Security for Virtualization Platform – Host security for SaaS, PaaS and IaaS – Data Security – Data Security Concerns – Data Confidentiality and Encryption – Data Availability – Data Integrity – Cloud Storage Gateways – Cloud Firewall
8	Architecture for Cloud Application	Cloud Application requirements- Architecture for traditional Vs Cloud Applications- Multi-tier Application Architecture- SOA for Cloud applications – Resource oriented SOA – Method –oriented SOA and Event Driven SOA – Parallelization within Cloud Applications – Leveraging In-memory Operations for Cloud Application
9	Cloud Programming	Programming Support for Google Apps engine: GFS, Big Tables, Googles NO SQL System, Chubby, Google Distributed Lock Service, Programming Support for Amazon EC2: Amazon S3, EBS and Simple DB etc.
10	Adoption and Use of Cloud	Adoption of Public cloud by SMBs- Public Cloud Adoption Cloud phase for SMBs- Vendor liability and Management Adoption process of Public clouds by Enterprises – Managed Private clouds Migrating Application to the cloud – Impact of Shared Resources and Multi-Tenancy on cloud Applications – Phases during Migration an Application to An IaaS Cloud
11	Risks of Cloud Computing and Related Costs	Risk Assessment and Management – Rosk of Vendor Lock-in – Risk of Loss of control over IT services- Risk of Poor Provisioning – Risk of Multi-tenant environment – Risk

FR. Conceicao Rodrigues College Of Engineering

Father Agnel Ashram, Bandstand, Bandra-west, Mumbai-50

Department of Information Technology Engineering

B.E. (IT) (semester VII) (2018-2019)

Course Outcomes & Assessment Plan

Subject: Cloud Computing (CC-BEITC702)

		failure of cloud provider – SLA risk –security, malware and Internet Attacks – Risk with Application Licensing.
12	AAA Administration for Clouds	AAA model – SSO for Clouds – Authentication management and Authorization management in clouds – Accounting for Resource utilization.
13	Security as a service	What can security as service offer- Benefits for Security as a service – Issues with Security as a Service- Identity Management as a Service
14	Mobile Cloud Computing	Introduction, Definition, Architecture, Benefits, challenges in mobile and at cloud shield

Internal Assessment:

Question paper will comprise of 6 questions, each carrying 20 marks.

Total 4 questions need to be solved.

Q.1 will be compulsory, based on entire syllabus.

Remaining question will be randomly selected from all the modules.
Weightage of marks should be proportional to number of hours assigned to each module.

Course Objectives (optional):

This course will help the students to get familiar with cloud computing fundamentals, architecture, services, implementation and deployment techniques etc.

Course Outcomes:

After completion of the course the learner should be able to:

1. Differentiate different computing techniques.
2. Compare various cloud computing providers/ Software.
3. Handle Open Source Cloud Implementation and Administration.
4. Understand risks involved in cloud computing.

FR. Conceicao Rodrigues College Of Engineering

Father Agnel Ashram, Bandstand, Bandra-west, Mumbai-50

Department of Information Technology Engineering

B.E. (IT) (semester VII) (2018-2019)

Course Outcomes & Assessment Plan

Subject: Cloud Computing (CC-BEITC702)

Mapping of CO and PO/PSO

Course Name	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
CO1		2	2	3									1	
CO2														
CO3		2	2	2									1	
CO4	3													

Course Outcomes Target:

		Direct Methods							Indirect Methods
	Test1	**Assig1**	**Lab Work**	**Test2**	**Assig2**	**University Theory Result**	**University Oral Result**	**MCQ**	Course Exit Survey
CO 1	**30%**	**20%**	**20%**	**-**	**-**	**10%**	**20%**	**-**	100%
CO 2	**30%**	**-**	**25%**	**-**	**20%**	**10%**	**15%**	**-**	100%
CO 3	**-**	**-**	**45%**	**25%**	**-**	**10%**	**20%**	-	100%
CO 4	**-**	**-**	**10%**	**50%**	**-**	**10%**	**30%**	-	100%

FR. Conceicao Rodrigues College Of Engineering

Father Agnel Ashram, Bandstand, Bandra-west, Mumbai-50

Department of Information Technology Engineering

B.E. (IT) (semester VII) (2018-2019)

Course Outcomes & Assessment Plan

Subject: Cloud Computing (CC-BEITC702)

Lesson Plan:

Date wise lecture plan

No of classes Planned:	**30**	**No of Classes taken:**	**24**	
Sr. No.	**Topic Planned**	**Planned Date**	**Actual Date**	**Delivery Mechanisms**
1.	Introduction, evolving and necessity of CC- Component of CC – Comparing CC with Virtualization, Grids, Utility Computing, client-server model, Revision-P-to-P Computing.Impact of CC on Business – Key Drivers for Cloud Computing - Revision	17/07/18	17/07/18	PPT,Board
2.	Cloud computing Service delivery model Cloud Types – Private, Public and Hybrid, when to avoid public cloud, Cloud API, Revision	19/07/18	19/08/18	PPT,Board
3.	Introduction & benefit of Virtualization – Implementation Levels of Virtualization- VMM Design, Requirement and Providers, virtualization at OS level - Middleware support for Virtualization,	7/08/18	7/08/18	PPT
4.	Virtualization structure/tools and mechanisms: Hypervisor and Xen Architecture- Binary Translation with full Virtualization, Paravirtualization with Compiler Support, Revision	08/08/18	08/08/18	PPT
5.	Virtualization for CPU, Memory and I/O Devices, Hardware support for Virtualization in Intel x86 processor – CPU Virtualization – Memory , Virtualization and I/O Virtualization – Virtualization in Multi-core processors, Revision	09/08/18	09/08/18	PPT
6.	XaaS, IaaS, PaaS, Leveraging PaaS for Productivity -Languages for PaaS,DBaaS(Database as a services) – SaaS Comparison of various cloud computing providers/ Software , Revision	21/08/18	21/08/18	PPT

FR. Conceicao Rodrigues College Of Engineering

Father Agnel Ashram, Bandstand, Bandra-west, Mumbai-50

Department of Information Technology Engineering

B.E. (IT) (semester VII) (2018-2019)

Course Outcomes & Assessment Plan

Subject: Cloud Computing (CC-BEITC702)

7.	Key Business Drivers for CC- Cloud computing and outsourcing Types of Scalability, Key Business Drivers for CC- Cloud computing and outsourcing Types of Scalability, Revision	23/08/18	23/08/18	PPT
8.	Key Business Drivers for CC- Cloud computing and outsourcing Types of Scalability, Security issues in Cloud Time to Market Benefits- Distribution over Internet – Three levels of Business value from Cloud computing, Revision	28/08/18	28/08/18	PPT
9.	Eucalyptus features, Architecture components,Revision	29/08/18	29/08/18	PPT
10.	Eucalyptus Installation and configuration process, Revision Eucalyptus Administration and Management Task, Eucalyptus Installation and configuration process Eucalyptus Administration and Management Task, Revision	30/08/18	30/08/18	PPT
11.	Architecture components Openstack Installation and configuration process, Openstack Administration and Management Task – Creating User Interface, Revision	04/09/18	04/09/18	PPT
12.	Factors for Successful Cloud Deployment – Network Requirements , Potential Problem areas in a cloud Network and their Mitigation , Revision	05/09/18	05/09/18	PPT
13.	Cloud Network Topologies – Automation and Self-service feature in a cloud –cloud performance, Revision	06/09/18	06/09/18	PPT
14.	Security for Virtualization Platform – Host security for SaaS, PaaS and IaaS – Data Security – Data Security Concerns, Data Confidentiality and Encryption – Data Availability – Data Integrity – Cloud Storage Gateways – Cloud Firewall, Revision	10/09/18	10/09/18	PPT
15.	Cloud Application requirements- Architecture for traditional Vs Cloud Applications- Multi-ties Application Architecture, SOA for Cloud applications – Resource oriented SOA – Method –oriented SOA and Event Driven SOA, Revision	11/09/18	11/09/18	PPT
16.	Parallelization within Cloud Applications – Leveraging In- memory Operations for Cloud Application, Revision	12/09/18	12/09/17	PPT
17.	Programming Support for Google Apps engine: GFS Big Tables, Googles NO SQL System, Chubby, Google Distributed Lock Service Programming Support for Amazon EC2: Amazon S3, EBS, SimpleDB , Revision	18/09/18	18/09/18	PPT

FR. Conceicao Rodrigues College Of Engineering

Father Agnel Ashram, Bandstand, Bandra-west, Mumbai-50

Department of Information Technology Engineering

B.E. (IT) (semester VII) (2018-2019)

Course Outcomes & Assessment Plan

Subject: Cloud Computing (CC-BEITC702)

18.	Adoption of Public cloud by SMBs- Vendor liability and Management, Adoption process of Public clouds by Enterprises, Managed Private clouds- Migrating Application to the cloud- Impact of Shared Resources and Multi-Tenancy on cloud Applications Phases during Migration an Application to An IaaS Cloud, Revision	19/09/18	19/09/18	PPT
19.	Risk of Multi-tenant environment Risk failure of cloud provider – SLA risk, Security, malware and Internet Attacks,Risk with Application Licensing , Revision	21/09/18	21/09/18	PPT
20.	Risk assessment and management, Risk of Vendor Lock in, Risk of Loss of control over IT services- Risk of Poor Provisioning, Revision	24/09/18	24/09/18	PPT
21.	AAA model-Authentication Authorization Accounting – SSO –Single sign on for clouds - Authentication management and Authorization management in clouds – Accounting for Resource utilization , Revision	24/09/18	23/09/18	PPT
22.	What can security as service offer- Benefits for Security as a service Issues with Security as a Service- Identity Management as a Service, Revision	25/09/18	25/09/18	PPT
23.	Introduction, Definition, Architecture of Mobile Cloud computing Benefits, challenges in Mobile Cloud computing, Revision	26/09/18	26/09/18	PPT
24.	Revision, Discussion of university question paper	27/09/18	27/09/18	PPT

Term Work:

The distribution of marks for term work shall be as follows:

· Experiment : ……..... (10) Marks.

· Assignment: ..... (10) Marks.

· Attendance ..... (05) Marks

TOTAL: ..... (25) Marks.

FR. Conceicao Rodrigues College Of Engineering

Father Agnel Ashram, Bandstand, Bandra-west, Mumbai-50

Department of Information Technology Engineering

B.E. (IT) (semester VII) (2018-2019)

Course Outcomes & Assessment Plan

Subject: Cloud Computing (CC-BEITC702)

Text Books/ Reference Books:

1. Cloud Computing Principles and Paradigms, Rajkumar Buyya Wiley

2. Distributed and Cloud Computing, Kai Hwang, Mk Publication

3. Cloud computing Black Book Dreamtech Publication

Assignment Plan

Sr.No	Date	Title
1		1. Compare Peer-to-Peer Architecture with cloud computing. 2. Explain -to-Peer Architecture well with some real examples.
2		1. Describe the Cloud Computing Provider: Google 2. Make a description of the various services provided by Google. 3. Also compare services provided by Google to the services provided by Microsoft Azure.