



Kadi Sarva Vishwavidyalaya

Faculty of Engineering & Technology

Fourth Year Bachelor of Engineering (IT)

(To be Proposed For: Academic Year 2020-21)

Subject Code: IT704D-N	Subject Title: Cloud Computing
Pre-requisite	Java Programming, Service Oriented Architecture

Teaching Scheme (Credits and Hours)

Teaching scheme				Total Credit	Evaluation Scheme					
L	T	P	Total		Theory		Mid Sem Exam	CIA	Pract.	Total
Hrs	Hrs	Hrs	Hrs		Hrs	Marks	Marks	Marks	Marks	Marks
04	00	02	06	05	03	70	30	20	30	150

Course Objective:

- The course presents a top-down view of cloud computing, from applications and administration to Programming, infrastructure, billing and security.
- To familiar students with this course.
- To Understand about Integration as a Service concepts.
- To learn about workflow engine for clouds.
- To Familiar with various cloud computing tools.
- To know about data security in cloud computing.

Outline of the Course:

Sr. No	Title of the Unit	Minimum Hours
1	Introduction to Cloud Computing	6
2	Migrating into a Cloud	4
3	Enriching the 'Integration as a Service' Paradigm for the Cloud Era	6
4	The Enterprise Cloud Computing Paradigm	8
5	Virtual Machines Provisioning and Migration Services	7
6	Virtual Machines for Cloud Infrastructures	8
7	Secure Distributed Data Storage in Cloud Computing	8
8	Workflow Engine for Clouds	9
9	Case Studies: Aneka, CometCloud, T-Systems, AWS	8

Total hours (Theory): 64

Total hours (Lab): 32

Total hours: 96



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Detailed Syllabus

Sr. No	Topic	Lecture Hours	Weightage (%)
1	Introduction to Cloud Computing: Cloud Computing in a Nutshell, Roots of Cloud Computing, Layers and Types of Clouds, Desired Features of a Cloud, Cloud Service Models, Challenges and Risks	6	9
2	Migrating into a Cloud: Introduction, Broad Approaches to Migrating into the Cloud, The Seven-Step Model of Migration into a Cloud	4	6
3	Enriching the 'Integration as a Service' Paradigm for the Cloud Era: Introduction, The Evolution of SaaS, The Challenges of SaaS Paradigm, Approaching the SaaS Integration Enigma, The Integration Methodologies, SaaS Integration Products and Platforms, SaaS Integration Services, SaaS Integration Appliances	6	9
4	The Enterprise Cloud Computing Paradigm: Introduction and Background, Issues for Enterprise Applications on the Cloud, Transition Challenges, Enterprise Cloud Technology and Market Evolution, Business Drivers Toward a Marketplace for Enterprise Cloud	8	13
5	Virtual Machines Provisioning and Migration Services: Virtual Machines Provisioning and Manageability, Virtual Machine Migration Services, VM Provisioning and Migration in Action, Provisioning in the Cloud Context.	7	10
6	Virtual Machines for Cloud Infrastructures: The Anatomy of Cloud Infrastructures, Distributed Management of Virtual Infrastructures, Scheduling Techniques for Advance Reservation of Capacity, Capacity Management to meet SLA Commitments	8	13
7	Secure Distributed Data Storage in Cloud Computing: Cloud Storage: from LANs TO WANs, Technologies for Data Security in Cloud Computing	8	13
8	Workflow Engine for Clouds: Workflow Management Systems and Clouds, Architecture of Workflow Management Systems, Utilizing Clouds for Workflow Execution, Case Study: Evolutionary Multi-objective Optimizations	9	14
9	Case Studies: Aneka, CometCloud, T-Systems, AWS: Aneka Cloud Platform, CometCloud Architecture, T-Systems	8	13
	Total	64	100



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Instructional Method and Pedagogy:

- At the start of course, the course delivery pattern, prerequisite of the subject will be discussed.
- Lectures will be conducted with the aid of multi-media projector, black board, OHP etc.
- Attendance is compulsory in lecture and laboratory which carries 10 marks in overall evaluation.
- One internal exam will be conducted as a part of internal theory evaluation.
- Assignments based on the course content will be given to the students for each unit and will be evaluated at regular interval evaluation.
- Surprise tests/Quizzes/Seminar/tutorial will be conducted having a share of five marks in the overall internal evaluation.
- The course includes a laboratory, where students have an opportunity to build an appreciation for the concepts being taught in lectures.

Learning Outcome:

On successful completion of this course, the student should be able to:

- Students will able to learn the core concepts of the cloud computing paradigm: how and why this paradigm shift came about, the characteristics, advantages and challenges brought about by the various models and services in cloud computing.
- Understand the tradeoffs in power, efficiency and cost by Load balancing approach.
- Learn virtualization and outline its role in enabling the cloud computing system model.
- Various cloud programming models and apply them to solve problems on the cloud.
- Students will understand various management and other distinguish services of AWS.
- Students will understand the migration and virtualization concepts.

E-Resources:

- <https://aws.amazon.com/>
- <http://www.cloudbus.org/>
- <https://nptel.ac.in/courses/106105167/>
- <https://www.salesforce.com>

Text and Reference Books:

- Rajkumar Buyya, Cloud Computing: Principles and Paradigms, John Wiley & Sons, First Edition
- Cloud Computing Bible. Barrie Sosinsky. John Wiley & Sons. ISBN-13: 978-0470903568.
- Amazon Web Services For Dummies. Bernard Golden. For Dummies. ISBN-13: 978- 1118571835
- IAM Getting started Guide <http://docs.aws.amazon.com/IAM/latest/UserGuide/getting-started.html>
- Building Applications in the Cloud: Concepts, Patterns and Projects by Christopher M. Moyer, Pearson Addison-Wesley Professional, ISBN-10: 0321720202, ISBN-13: 978-0321720207
- Cloud Computing Design Patterns by Thomas Erl, Prentice Hall, ISBN-10: 0133858561, ISBN-13: 978-0133858563



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List of experiments:

No	Name of Experiment
1	To Study Various Cloud Computing Tools
2	Implementation of Para-Virtualization using VM Ware's Workstation/ Oracle's Virtual Box and Guest O.S.
3	Installation and Configuration of Hadoop.
4	To configure and run sample program in cloudsim.
5	Create an application (Ex: Word Count) using Hadoop Map/Reduce.
6	To run sample program using Google App Engine.
7	To setup Aneka tools.
8	Configure and run sample program using Openstack.
9	Create account in AWS and run sample service using AWS
10	Creating an Application in Salesforce.com using Apex programming Language.