Master of Engineering - ME (Cloud Computing)

Course Name : **Cloud Architecture and Management Lab Course Code** : CDC 5152 **Academic Year** : 2024 - 25 **Semester** : I **Name of the Course Coordinator** : Dr. PRATHIVIRAJ N **Name of the Program Coordinator** : Mr. Sreepathy HV

Course File

Signature of Program Coordinator Signature of Course Coordinator

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Program Education Objectives (PEOs)

The overall objectives of the Learning Outcomes-based Curriculum Framework (LOCF) for **ME (Cloud Computing)**, program are as follows.

PEO No.	Education Objective
PEO 1	Develop advance knowledge and understanding of the theories, concepts, and principles related to Cloud Computing, including virtualization, distributed systems, cloud networks, security, micro services, and cloud infrastructure management services.
PEO 2	Apply critical thinking and problem-solving skills to address complex challenges in cloud computing such as scalability, resource scheduling, performance optimization and data management.
PEO 3	Gain practical, hands-on experience with global cloud provider services, DevOps tools, automation and container

orchestration services through coursework and applied research experiences.

Program Outcomes (POs)

By the end of the postgraduate program in **ME (Cloud Computing)**, graduates will be able to:

PO1 An ability to independently carry out research /investigation and development work to solve practical problems.

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PO2 An ability to write and present a substantial technical report/document.

PO3 Students should be able to demonstrate a degree of mastery over the area as per the specialization of the program. The

mastery should be at a level higher than the requirements in the appropriate bachelor program.

An ability to design, develop scalable, highly available and fault-tolerant cloud solutions, services for business needs and

PO4 implement well architected cloud architectures based on theoretical principles, ethical considerations, and detailed

knowledge of the underlying infrastructure, applications and data.

PO5 An ability to demonstrate knowledge of securing cloud resources, data and infrastructure and apply DevOps best practices

to automate software development life cycle.

1. Course Plan

1.1 Primary Information

Course Name : Cloud Computing and Management Lab [CDC 5152]

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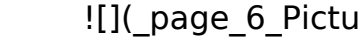
L-T-P-C : 3-0-0-1

Contact Hours : 36 Hours

Pre-requisite : Basics of Operating System

Core/ PE/OE : Core



1.2 Course Outcomes (COs), Program outcomes (POs) and Bloom's Taxonomy Mapping

CO At the end of this course, the student should be able to: No. of Contact Program Outcomes BL

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Hours (PO's)

CO1 Design a cluster and virtualized server to understand distributed computing and virtual machine respectively 12 PO3 3

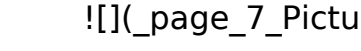
Design Private Cloud using open

CO2 source tools to understand basic characteristics and 12 PO4 4

overview of Cloud Computing.

CO3 Design a High availability, Scalable and Fault tolerant 12 PO5 3

architecture for web application using AWS Services.



1.3 Assessment Plan

Components Lab Test Flexible Assessments End semester/ Makeup

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(2 - 3 in number) examination

Duration 90 minutes To be decided by the faculty. 180 minutes

Weightage 0.3 0.2 0.5

Typology of questions Applying; Analyzing. Applying; Analyzing. Applying; Analyzing.

Pattern Answer all the questions. Maximum Assignment: Solving Use case with openstack.). Maximum 20 marks. Answer all the questions. Maximum marks 50.

marks 30.

Schedule As per academic Assignment submission: November As per academic calendar.

calendar. 2023

Topics covered Clustering and Comprehensive examination

virtualization covering the full syllabus.

1.4 Lesson Plan

L. No.	TOPICS	Course Outcome Addressed
L0	Course delivery plan, Course assessment plan, Course outcomes, Program outcomes, CO-PO mapping, reference books	---
Lab1	Carry out experiment to demonstrate distributed computing.	CO1
Lab2	Carry out an experiment to create virtual server to demonstrate the virtual machine.	CO1
Lab3	Carry out an experiment to create virtual server to demonstrate the virtual machine.	CO1
Lab4	Carry out an experiment to create virtual server to demonstrate the virtual machine.	CO1
Lab5	Carry out experiment to demonstrate cloud computing features with OpenStack.	CO2
Lab6	Carry out experiment to demonstrate cloud computing features with OpenStack.	CO2
IT1	Internal lab test	CO1, CO2
Lab7	Carry out experiment to design a private cloud setup using OpenStack	CO2
Lab8	Carry out experiment to design a private cloud setup using OpenStack	CO2
Lab9	Carry out experiment to design a private cloud setup using OpenStack	CO2

Lab10 Carry out experiment to understand loading web application using AWS services. CO3

Lab11 Carry out experiment to understand loading web application using AWS services. CO3

Lab12 Carry out experiment to understand loading web application using AWS services. CO3

1.5 References

- 1. Barrie Sosinsky, "Cloud Computing Bible", Wiley-India, 2010

- 2. Rajkumar Buyya, James Broberg, Andrzej M. Goscinski, ",Cloud Computing: Principles and Paradigms", Wiley, 201

- 3. Nikos Antonopoulos, Lee Gillam, "Cloud Computing: Principles, Systems and Applications", Springer, 2012. Ronald L. Krutz, Russell

- Dean Vines,"Cloud Security: A Comprehensive Guide to Secure Cloud Computing", Wiley-India, 2010

- 4. https://in.coursera.org/learn/cloud-computing-basic

1.6 Other Resources (Online, Text, Multimedia, etc.)

- 1. Web Resources: Blog, Online tools and cloud resources.

- 2. Journal Articles.

1.7 Course Timetable

1 st Semester Cloud Computing Room: Cloud Lab

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9-10 10-11 11-12 12-1 1-2 2-3 3-4 4-5

MON

TUE

WED

THU

FRI CAM Lab

SAT

1.8 Assessment Plan

COs Marks & weightage

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CO CO Name Lab Assignment End CO wise

No. Test (Max. 20) Semester Weightage

(Max. (Max. 50)

30)

CO1 Design a cluster and virtualized server to understand distributed 20 - 20 0.40

computing and virtual machine

respectively

CO2 Design Private Cloud using open 10 8 20 0.38

source tools to understand basic

characteristics and overview of

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Cloud Computing.

Design a High availability, Scalable and tolerant Fault

CO3 - 12 10 0.22

architecture for web application

using AWS Services.

Marks (weightage) 0.3 0.2 0.5 1.0

Note:

- In-semester Assessment is considered as the Internal Assessment (IA) in this course for 50 marks, which includes the performances in class participation, assignment work,

class tests, mid-term tests, quizzes etc.

- End-semester examination (ESE) for this course is conducted for a maximum of 100 and the same will be scaled down to 50.

- End-semester marks for a maximum of 50 and IA marks for a maximum of 50 are added for a maximum of 100 marks to decide upon the grade in this course.

Weightage for CO1 = (IT1 marks for CO1 / 2.5 + IT2 marks for CO1 / 2.5 + Assignment marks for CO1 + ESE marks for CO1 / 2)/100

= (25/2.5 + 0 + 0 + 20/ 2)/100 = 0.2

1.9 Assessment Details

The assessment tools to be used for the Current Academic Year (CAY) are as follows:

SI. No.	Tools	Weightage	Frequency	Details of Measurement (Weightage/Rubrics/Duration, etc.)
1	Internal Test	0.4	2	- Performance is measured using internal test attainment level. - Reference: question paper and answer scheme. - Each internal test is assessed for a maximum of 50 marks and scaled down to 40 marks.
2	Assignments	0.1	1	- Performance is measured using assignments/quiz attainment level. - Assignments/quiz are evaluated for a maximum of 10 marks.
				- Performance is measured using ESE attainment level. - Reference: question paper and

3 ESE 0.5 1 answer scheme.

- ESE is assessed for a maximum of 100 marks and scaled down to 50 marks.

1.10 Course Articulation Matrix

CO	PO1	PO2	PO3	PO4	PO5
CO1		Y			
CO2			Y		
CO3				Y	
Average Articulation Level			*	*	*