



Government Holkar (Model, Autonomous) Science College, Indore (M.P.)

Computer Science Department

Part A - Introduction

Programme - B.Sc. (Computer Science - Major)	Class – B.Sc. VI Semester	Year- 2025	Session- 2024-25
Course Type (Computer Science) – Major			
1	Course Code	S6-CSC1T	
2	Course Title	Cloud Computing	
3	Pre – requisite (if any)	This course can be opted by the students of Computer Science	
4	Course Learning Outcomes (CLO)	After studying this subject, student will be able to do the following- <ol style="list-style-type: none">Evaluate trade-offs between deploying applications in the cloud and on local infrastructure.Compare the advantages and disadvantages of various cloud computing platforms.Deploy applications on commercial cloud computing infrastructures such as Amazon Web Services, Windows Azure, and Google AppEngine.Develop data-intensive parallel applications in the cloud.Examine the performance, scalability, and availability of underlying cloud technologies and software.	
5	Credit Value	4 Credits	
6	Total Marks	Formative Assessment (CCE) – 40 Marks Summative Assessment (End Semester Exam) – 60 Marks Total 40+60= 100 Marks	Minimum Pass Marks – 35

Dr. Prajapati

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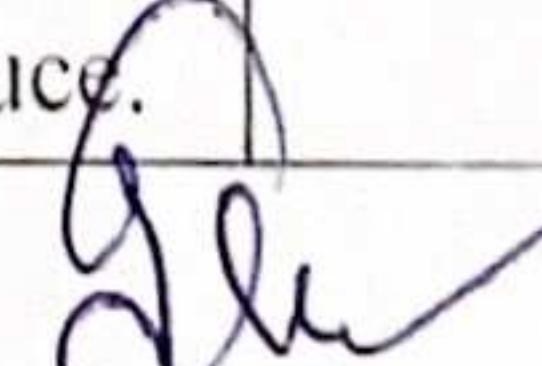
Department of Computer Science

Govt. Holkar Science College

INDORE (M.P.)

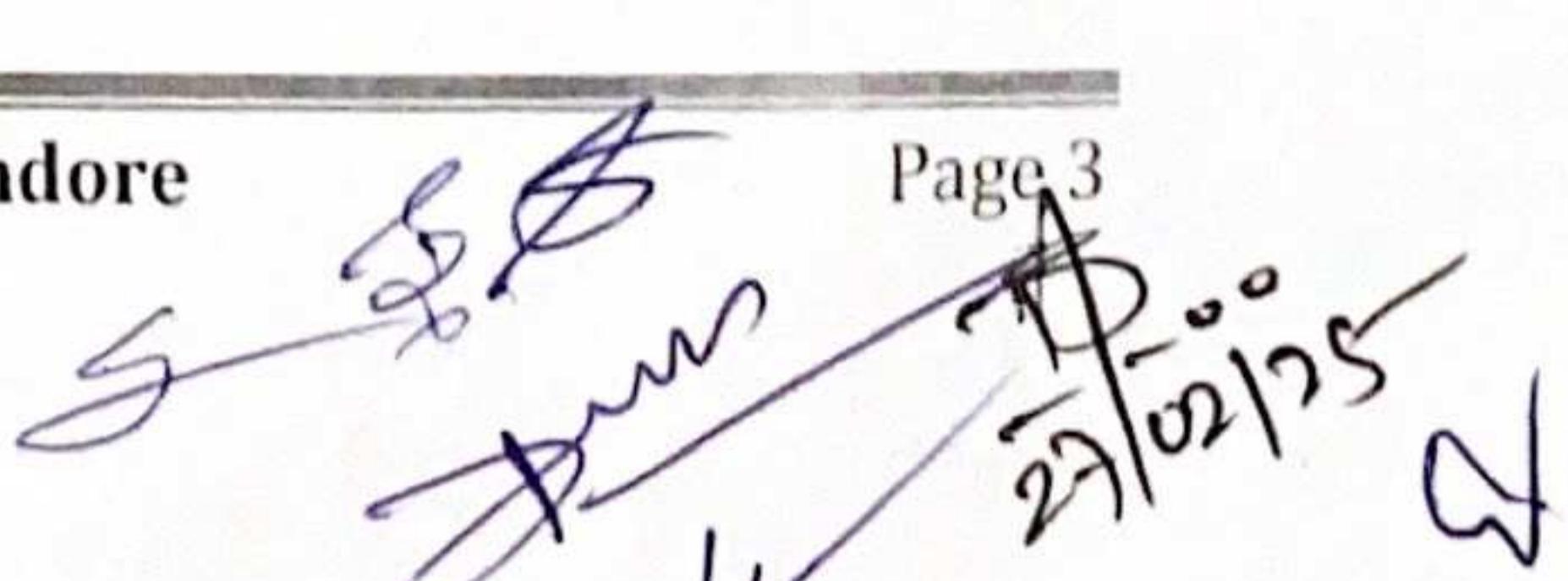
Part A - Introduction			
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Course Type (Computer Science) – Major			
Course Code	S6-CSC1T		
Course Title	Cloud Computing		

Part – B Content of the Course		
Total no. of lectures – As per UGC rules (1 Credit = 15 Lectures)		
S. No.	Topics	No. of Lectures
I	Cloud Computing - Introduction, Definition, characteristics, components. Cloud service provider, the role of networks in Cloud computing. Cloud deployment models - private, public & hybrid, Cloud service models. multitenancy, Cloud economics and benefits. Cloud computing platforms – IaaS: Amazon EC2, S3 Bucket, PaaS: Google App Engine, Microsoft Azure, SaaS: AWS IAM (Identity and Access Management).	12
II	Virtualization: Virtualization concepts, Server virtualization, Storage virtualization, Storage services, Network virtualization, Service virtualization, Virtualization management, Virtualization technologies and architectures, virtual machine, Measurement and profiling of virtualized applications. Hypervisors: KVM, Xen, VMware hypervisors and their features. Introduction to Containerization Technology, Virtualization vs Containerization. Container Engine Tools: Docker/Podman.	12
III	Data in cloud computing - Relational databases, Cloud file systems: GFS and HDFS, BigTable, HBase and Dynamo. MapReduce and extensions: Parallel computing, the map -Reduce model, Parallel efficiency of MapReduce, Relational operations using Map-Reduce, Enterprise batch processing using MapReduce.	12


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Department of Computer Science
Devi. Holkar Science College -
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Part A - Introduction			
Programme - B.Sc. (Computer Science - Major)	Class – B.Sc. VI Semester	Year - 2025	Session- 2024-25
Course Type (Computer Science) – Major			
Course Code		S6-CSCIT	
Course Title		Cloud Computing	

IV	<p>Cloud security - Cloud security fundamentals, Vulnerability assessment tool for cloud, Privacy and Security in cloud.</p> <p>Cloud computing security architecture - General Issues. Trusted Cloud computing, Secure Execution Environments and Communications, Micro- architectures; Identity Management and Access control Autonomic security.</p> <p>Security challenges: Virtualization security management - virtual threats, VM Security Recommendations, VM - Specific Security techniques, Secure Execution Environments and Communications in cloud.</p>	12
V	<p>Issues in cloud computing - Implementing real time application over cloud platform, Issues in Inter-cloud environments, QOS Issues in Cloud, Dependability, data migration, streaming in Cloud. Quality of Service (QoS) monitoring in a Cloud computing environment, Cloud Middleware, Mobile Cloud Computing, Inter Cloud issue, A grid of clouds, Sky computing, load balancing, resource optimization. resource dynamic reconfiguration, Monitoring in Cloud.</p>	12

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Department of Computer Sciences
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Part A - Introduction

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Course Type (Computer Science) – Major			
Course Code		S6-CSC1T	
Course Title		Cloud Computing	

Part – C Learning Resources

Text Books, Reference Books, Other Resources

Suggested Readings:

Text Books:

1. Shroff Gautam, Enterprise Cloud Computing, Cambridge Publication.
2. Ronald Krutz and Russell Dean Vines, Cloud Security, Wiley-India.
3. Dr. Kumar Saurabh, "Cloud Computing", Wiley Publication.

Reference Books:

1. Bloor R., Kaufman M., Halper F. Judith Hurwitz "Cloud Computing for Dummies" Wiley India Edition.
2. John Rittinghouse & James Ransome, "Cloud Computing Implementation Management and Strategy", CRC Press.
3. Anthony T Velte, "Cloud Computing: A Practical Approach", McGraw Hill
4. Michael Miller, "Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate Online".
5. James E Smith, Ravi Nair, "Virtual Machines", Morgan Kaufmann Publishers.

Suggested Digital Platforms Web Links:

1. https://www.tutorialspoint.com/cloud_computing/cloud_computing_tutorial.pdf
2. <https://www.cse.iitb.ac.in/~es695/>
3. https://www.cse.iitb.ac.in/convergence/workshops/Intro_to_Virtualization.pdf

Suggested Equivalent Online Courses:

1. <https://nptel.ac.in/courses/106/105/106105167/>

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Department of Computer Science

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Govt. H.S.C. College

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Part A - Introduction

Programme - B.Sc. (Computer Science - Major)	Class – B.Sc. VI Semester	Year- 2025	Session- 2024-25
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Part – D Assessment and Evaluation

Internal Assessment: Continuous Comprehensive Evaluation (CCE)/ Formative Assessment: 40 Marks

Formative Assessment shall be based on – Quiz, Seminar, Presentation, Written test, Case Study, Project, Assignment etc.

The division of marks is as follows:

Test I (Written Test)	20 Marks	Best two test Marks = (20 + 20)	Section (A): 5 Objective Questions (1 mark each)	$5 \times 1 = 5$
Test II (Written Test)	20 Marks		Section (B): 5 Short Questions out of eight questions (200 words each) (7 Marks each)	$5 \times 7 = 35$
Test III	20 Marks		Section (C): Two long questions out of four questions (500 Words each) (10 Marks each)	$2 \times 10 = 20$
Total Internal Assessment (CCE) Marks		40 Marks	Total External Evaluation (Theory) Marks (A+B+ C)	60 Marks
Note:-	1.	For Major, Minor, Open Elective, Foundation and Vocational Courses, Part D will be as per the scheme of marks given.		
	2.	The student should secure 35% marks in Internal Assessment (CCE) and External Evaluation (theory) combined.		

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Government Holkar (Model, Autonomous) Science College, Indore (M.P.)

Computer Science Department

Part A- Introduction (Practical)

Programme - B.Sc. (Computer Science - Major)	Class – B.Sc. VI Semester	Year- 2025	Session- 2024-25
Course Type (Computer Science) – Major			
1.	Course Code	S6-CSC1TP	
2.	Course Title	Cloud Computing Lab	
3.	Pre-requisite (if any)	This course can be opted by the students of Computer Science.	
4.	Course Learning Outcomes (CLO)	After studying this subject, student will be able to: <ol style="list-style-type: none">Identify and manage different cloud services and deployment models.Understand the importance of virtualization and its related technologies.Put into practice the ability to control virtual machines.Analyze and plan backup strategies for securing cloud data.Create and utilize various cloud computing services for practical purposes.Assess and optimize the creation and management of Docker containers in real-world scenarios.	
5.	Credit Value	2 Credits	
6.	Total Marks	Formative Assessment (CCE) – 40 Marks Summative Assessment (End Semester Exam) – 60 Marks Total 40+60= 100 Marks	Minimum Pass Marks – 35

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Part B- Content of the Course

Total no. of lectures – As per UGC rules: 30 Lecture

Suggestive List of Practicals

Note - The students shall explore development of web applications in cloud. They must practically design and develop processes involved in creating a cloud-based application and programming using Hadoop.

1.	Download and Install Virtual Machine (Virtual Box, VMware and KVM).
2.	Installing Virtual Machine
3.	Controlling Virtual Machine (Start, restart, power off)
4.	Editing Virtual Machine Hardware
5.	Creating and Using Image snapshot
6.	Importing and Exporting Virtual Machine images
7.	Accessing Linux Command Line
8.	Managing Files from the command Line
9.	Creating, Viewing, and Editing Text Files.
10.	Installing and updating Software packages
11.	Controlling Services
12.	Create AWS free tier account
13.	Introduction to IAM
14.	Creating User and Group
15.	Authorization via Policies
16.	Creating and Attaching Policies
17.	Launching an EC2 running Linux
18.	How to ssh into EC2 using Linux/Windows
19.	Launching an EC2 running Windows
20.	Connect Windows Instance using RDP
21.	Hosting Website on EC2 Instance
22.	Create AWS Custom AMI
23.	Copy AMI from one region to another
24.	Share AMI with AWS account
25.	Create S3 Bucket
26.	Upload/Download files from S3 Bucket
27.	Containerized Application Using Docker container
28.	Install docker on EC2 Instance
29.	Creating and managing Docker containers
30.	Pull and push docker images from docker hub
31.	Creating Docker custom Images

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Part – C Learning Resources

Text Books, Reference Books, Other Resources

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Suggested Digital Platforms Web Links:

1. https://www.tutorialspoint.com/cloud_computing/cloud_computing_tutorial.pdf
2. <https://www.cse.iitb.ac.in/~es695/>
3. https://www.cse.iitb.ac.in/convergence/workshops/Intro_to_Virtualization.pdf

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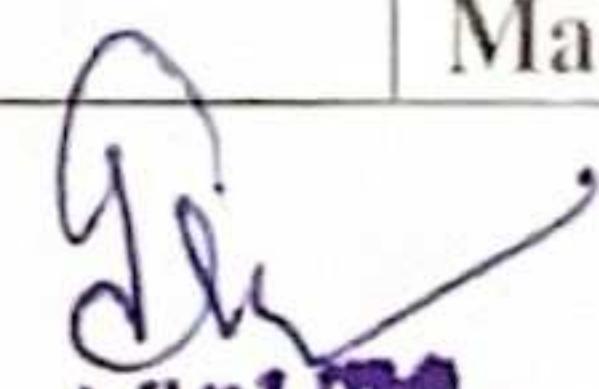
1. <https://nptel.ac.in/courses/106/105/106105167/>

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Part D- Assessment and Evaluation

Suggested Continuous Evaluation methods:

Internal Assessment/Formative Examination(A):	40 Marks
Lab Record	15 Marks
Attendance in the Lab	05 Marks
Assignments (It can be in different modes)	20 Marks
End Semester External Evaluation (B):	60 Marks
Viva Voce on Practical	10 Marks
Practical Record File	10 Marks
Experiments	40 Marks
Total Marks (A+B)	(40 + 60 = 100 Marks)


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