

**FACULTY OF COMPUTER APPLICATIONS**  
**Course**

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- **Sem.** : 6
- **Subject Code** : 05BS0605
- **Subject** : Cloud Computing
- **Course Objectives** :
  1. Understand cloud computing basics.
  2. Understand Various architecture used to model cloud computing.
  3. Understand Storages and Service Models.
  4. Understand security and tools that maintains it.
  5. Understand AWS or any cloud that provides all Service Models.
- **Prerequisites:**
  - Basic knowledge of Hardware and Software for computing
  - Basic knowledge of Operating System architectures
  - Basic knowledge of Linux shell

<b>Unit No</b>	<b>Topics Covered</b>	<b>No of lectures required</b>
<b>1</b>	<b>Introduction:</b> Cloud Computing Basics, History Of Cloud Computing, Characteristics Of Cloud Computing, Advantages and Disadvantages Of Cloud Computing, Nature Of the Cloud, Technologies In Cloud Computing, Cloud Computing Adoption	<b>10</b>
<b>2</b>	<b>Cloud Computing Architecture:</b> Cloud Lifecycle Model, Role Of Cloud Modelling and Architecture, <b>Virtualization:</b> Definition Of Virtualization, Types Of Virtualizations, Virtualization Architecture and Software, Virtualization Application, Pitfalls Of Virtualization	<b>10</b>
<b>3</b>	<b>Cloud Storage:</b> What Is Cloud Storage? How Cloud Storage Works	<b>10</b>

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	<b>Cloud Deployment Model:</b> Public, Private, Hybrid, Community, <b>Cloud Service Model:</b> Software As A Service (Saas), Platform As A Service (Paas), Infrastructure As A Service (Iaas),	
<b>4</b>	<b>Security:</b> Cloud Computing Risks, Risk Management, Types Of Risks in Cloud Computing, Digital Persona and Data Security, <b>Tools:</b> Tools For Building Cloud, Programming In Cloud,	<b>10</b>
<b>5</b>	<b>Tools Of Cloud Computing Aws &amp; Azure:</b> What are Exactly Aws and Azure What Are the Key Differences of Aws and Azure? Regions And Availability Compute Services Key Tools of Aws and Azure Pros And Cons Of Aws And Azure	<b>8</b>

**Course Outcomes:**

1. Able to remember the fundamental concepts in virtualization to understand the trade-offs in power, efficiency and cost by the Load balancing approach and instances.
2. Able to understand Linux commands used to manage core architecture.
3. Able to apply the fundamental concepts of cloud storage and service models.
4. Able to Analyze various clouds Service models and apply them to solve problems on the cloud.
5. Able to Evaluate the architecture and infrastructure of cloud computing, various management and other distinguish services of AWS or any other available provider.

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**Course Outcomes – Program Outcomes Mapping Table:**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	-	-	-	-	-	-	-	-
CO2	L	-	-	-	-	H	-	-
CO3	M	-	-	-	-	M	-	-
CO4	M	-	-	-	-	M	-	H
CO5	H	-	-	-	-	H	-	H

**Text Book :**

- 1. Cloud Computing A practical Approach, Author, Anthony T. Velte, Toby J. Velte, Robert Elsenpeter, McGraw Hill, 2010**

**Reference Books :**

- 1. Cloud Computing Bible, Barrie Sosinsky, Wiley-India, 2010**
- 2. Cloud Computing: Principles and Paradigms, Rajkumar Buyya, James Broberg, Andrzej M. Goscinski, Wile, 2011**
- 3. Cloud Computing for Dummies, Judith Hurwitz, R Bloor, M.Kanfman, F.Halper, Wiley-India, Latest Edition**

**Web References :**

- 1. <https://www.javatpoint.com/cloud-computing>**
- 2. <https://www.geeksforgeeks.org/cloud-computing-tutorial>**

**Syllabus Coverage from text /reference book & web/app reference:**

Unit	Chapter Numbers
1	Book 1:Chapter 1: 1.1,1.2,1.4 Book 1:Chapter 2: 2.1,2.2,2.3,2.4
2	Book 1:Chapter 5: 5.1,5.2 Book 1:Chapter 8: 8.1,8.3,8.4,8.6,8.7
3	Book 1:Chapter 12: 12.1,12.3 Book 1:Chapter 16: 16.1, 16.2, 16.3, 16.4
4	Book 1:Chapter 18: 18.1, 18.2, 18.5 Book 1:Chapter 19: 19.4, Book 1:Chapter 24: 24.6,24.7 Book 1:Chapter 27: 27.1
5	Book 1:Chapter 31: 31.1,31.2,31.3,31.4

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**PRACTICALS**

<b>Unit No</b>	<b>List of Practicals</b>
<b>1,2</b>	<ol style="list-style-type: none"> <li>1. Downloading Oracle Virtual Box</li> <li>2. Installing Virtual Box</li> <li>3. Creating an Image in virtual Box</li> <li>4. Map an virtual box for OS</li> <li>5. Map IP Address of VirtualBox</li> <li>6. Install Ubuntu in virtual box by mapping 2Gb of ram and its storage.</li> <li>7. Create user account in installed OS</li> <li>8. Understanding Host &amp; Guest in VBS</li> <li>9. Connecting Host &amp; Guest for resources</li> <li>10. Exporting image as VDI.</li> </ol>
<b>3,4</b>	<ol style="list-style-type: none"> <li>1. <b>grep Command:</b> <ul style="list-style-type: none"> <li>• Search for the word "error" within a text file named "log.txt" and display the matching lines.</li> <li>• How can you use the "grep" command to perform a case-insensitive search for a specific pattern across multiple files in a directory?</li> <li>• Find all lines in a file named "data.csv" that contain both "John" and "Smith" using the "grep" command.</li> </ul> </li> <li>2. <b>head Command:</b> <ul style="list-style-type: none"> <li>• Display the first 10 lines of a file named "document.txt" using the "head" command.</li> <li>• How can you adjust the number of lines shown when using "head" to display the first few lines of a file?</li> <li>• Use the "head" command to display the first 20 lines of all text files in a directory.</li> </ul> </li> <li>3. <b>tail Command:</b> <ul style="list-style-type: none"> <li>• Show the last 15 lines of a log file named "server.log" using the "tail" command.</li> <li>• How can you continuously monitor a file for new content using the "tail" command with the "-f" flag?</li> <li>• Display the last 50 lines of a file while excluding the 20 most recent lines using the "tail" command.</li> </ul> </li> <li>4. <b>less Command:</b></li> </ol>

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	<ul style="list-style-type: none"><li>• Open a large text file named "long_document.txt" in "less" and navigate to the end of the file.</li><li>• How can you search for a specific keyword, such as "Linux," within a file using the "less" command?</li><li>• Use "less" to view a file one screen at a time, and explain how to navigate between pages.</li></ul> <p><b>5. more Command:</b></p> <ul style="list-style-type: none"><li>• View the content of a file named "notes.txt" page by page using the "more" command.</li><li>• How can you scroll backward through pages when using the "more" command?</li><li>• Use "more" to display the first 20 lines of a file and prompt the user to continue or quit.</li></ul> <p><b>6. chmod Command:</b></p> <ul style="list-style-type: none"><li>• Change the permissions of a file named "data.txt" to allow read and write access for the owner and only read access for others using the "chmod" command.</li><li>• Explain the numeric representation of file permissions and how to set them using the "chmod" command.</li><li>• Use the "chmod" command to remove write permissions for the group on a directory and all its contents.</li></ul> <p><b>7. chown Command:</b></p> <ul style="list-style-type: none"><li>• Change the owner of a file named "file.txt" to a user named "newuser" using the "chown" command.</li><li>• How can you change both the owner and group of a directory and its contents using the "chown" command?</li><li>• Explain the syntax for specifying the new owner and group when using the "chown" command.</li></ul> <p><b>8. apt Command:</b></p> <ul style="list-style-type: none"><li>• Update the package database on your Debian-based Linux system using the "apt" command.</li><li>• Install a package named "nginx" on your Ubuntu system using the "apt" command.</li><li>• How can you search for available packages containing the keyword "database" using the "apt" command?</li></ul> <p><b>9. useradd Command</b></p>
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	<ul style="list-style-type: none"> <li>• Create a new user account named "johndoe" with a home directory and a specific user ID using the "useradd" command.</li> <li>• How can you add a user to multiple secondary groups when creating a new user account with "useradd"?</li> <li>• Use "useradd" to create a new user without a home directory.</li> </ul> <p><b>10. userdel Command:</b></p> <ol style="list-style-type: none"> <li>1. Delete a user account named "expireduser" and remove their home directory using the "userdel" command.</li> <li>2. How can you prevent a user's home directory from being removed when deleting the user with "userdel"?</li> <li>3. Use "userdel" to remove a user account without deleting their home directory.</li> </ol>
<b>5</b>	<ul style="list-style-type: none"> <li>• Creating an account in AWS or any other platform</li> <li>• Understanding Dashboard</li> <li>• Understanding RBAC in Amazon and Azure</li> <li>• Understanding Cloud Storages</li> <li>• Understanding AWS S3 and Azure Blob</li> <li>• Understanding Permissions for storage access</li> </ul>