**Syllabus:** CTV Cloud Storage and Virtualization



| **School: SET** | | **Batch : 2021-25** | | | | |
| --- | --- | --- | --- | --- | --- | --- |
| **Program:B.Tech** | | **Current Academic Year: 2021-22** | | | | |
| **Branch: CSE** | | **Semester: IV** | | | | |
| 1 | Course Code |  |  | | | |
| 2 | Course Title | Cloud Storage and Virtualization | | | | |
| 3 | Credits | 3 | | | | |
| 4 | Contact Hours  (L-T-P) | 3-0-0 | | | | |
|  | Course Status | UG | | | | |
| 5 | Course Objective | 1. To familiarize the students about the importance of Undergraduate courses in Computer Science & Engineering with specialization of Cloud Computing. 2. To discuss recent developments in hardware, software and service environments. 3. To focus on future applications, technologies and environments of cloud computing. 4. To discuss various research and development options in Computer Science and Engineering with the help of cloud computing. | | | | |
| 6 | Course Outcomes | **The student should be able to:**   1. Understand the technical aspects of cloud computing in Computer Science & Engineering Course. 2. Perceive some knowledge about programming and configuration of virtual environments. 3. Characterize the distinctions between Infrastructure, Platform and Software as a Service (IaaS, PaaS, SaaS) in a virtualized environment. 4. Discover the concept of resource management in virtualized environment 5. Analyze the security services on AWS cloud 6. Implement the applications on AWS cloud. | | | | |
| 7 | Course Description | This course introduces advanced aspects of Cloud Computing, encompassing the principles, to analyze the cloud, identify the problems, and choose the relevant models and algorithms to apply. | | | | |
| 8 | Outline syllabus | | | | | CO Mapping |
|  | **Unit 1** | **Introduction to Virtualization** | | | |  |
| A | Introduction to Cloud Computing, Traditional IT Infrastructure,. | | | | CO1 |
| B | Benefits of Virtualization. Cloud Characteristics | | | |
| C | Types of Virtualization, History of Virtualization | | | |
|  | **Unit 2** | **VIRTUALIZATION SERVER AND STORAGE** | | | |  |
| A | Types of Server Virtualization, Hypervisors, | | | | CO2 |
| B | Anatomy of Server Virtualization, Benefits of Storage Virtualization, Types of Storage Virtualization, VPN, | | | |
| C | VLAN, Benefits of Application Virtualization. | | | |
|  | **Unit 3** | **CLOUD ARCHITECTURE** | | | |  |
| A | History of Cloud Computing. Anatomy of Cloud Computing, Cloud Computing Reference Architecture, Public, Private and Hybrid Clouds, | | | | CO3 |
| B | Cloud Service Providers, laaS, PaaS, SaaS, Architectural Design Challenges | | | |
| C | Cloud Storage, Storage-as-a-Service, Advantages of Cloud Storage, Cloud Storage Providers. | | | |
|  | **Unit 4** | **RESOURCE MANAGEMENT IN VIRTUALIZATION** | | | |  |
| A | Inter Cloud Resource Management, Resource Provisioning and Resource Provisioning Methods, Global Exchange of Cloud Resources, | | | | CO4, CO5 |
| B | Security Overview, Cloud Security Challenges, Software-as-a-Service Security, Security Governance, Virtual Machine Security, IAM, Security Standards. | | | |
| C | Linux server virtualization. Root password setup in Linux environment. | | | |
|  | **Unit 5** | **Introduction to AWS.** | | | |  |
| A | AWS Services:EC2, Identity Access and Management, Simple storage services | | | | CO5, CO6 |
| B | Lambda, Elastic block storage , Linux server installation | | | |
| C | Web server setup on AWS. Deployment of web application in Linux apache web server | | | |
|  | Mode of examination | Theory | | | | |
|  | Weightage Distribution | CA | | MTE | ETE |  |
| 25% | | 25% | 50% |  |
|  | Text book/s\* | 1. Kai Hwang, Geoffrey C. Fox, Jack G. Dongarra, "Distributed and Cloud Computing, From Parallel Processing to the Internet of Things", Morgan Kaufmann Publishers, 2012. 2. 2. Rittinghouse, John W., and James F. Ransome, ―Cloud Computing: Implementation, Management and Security‖, CRC Press, 2017. 3. AWS Educate Cloud Practitioners Essentials contents | | | | |
|  | Other References | 1. Rajkumar Buyya, Christian Vecchiola, S. ThamaraiSelvi, ―Mastering Cloud Computing‖, Tata Mcgraw Hill, 2013. 2. Toby Velte, Anthony Velte, Robert Elsenpeter, "Cloud Computing - A Practical Approach‖, Tata Mcgraw Hill, 2009. 3. George Reese, "Cloud Application Architectures: Building Applications and Infrastructure in the Cloud: Transactional Systems for EC2 and Beyond (Theory in Practice)‖, O'Reilly, 2009. 4. Foundations of Computer Science, B A Forouzan& F Mosharraf, 2/e, 2008, Delmar Learning. 5. https://aws.amazon.com/developer/language/java/ 6. https://aws.amazon.com/developer/ 7. https://www.alibabacloud.com/product | | | | |

**CO and PO Mapping**

| S. No. | Course Outcome | Program Outcomes (PO) & Program Specific Outcomes (PSO) |
| --- | --- | --- |
| 1. | CO1: Understand the technical aspects of cloud computing in Computer Science & Engineering Course. | PO1, PO2, PO12, PSO3 |
| 2. | **CO2:** Perceive some knowledge about programming and configuration of virtual environments. | PO1, PO12, PSO1, PSO3 |
| 3. | **CO3:** Characterize the distinctions between Infrastructure, Platform and Software as a Service (IaaS, PaaS, SaaS) in virtualized environment. | PO1, PO2, PO12, PSO2, PSO3 |
| 4. | **CO4:** Discover the concept of resource management in virtualized environment | PO1, PO12, PSO2, PSO3 |
| 5. | **CO5:** Analyze the security services on AWS cloud | PO1, PO6, PO8, PO12, PSO2, PSO3 |
| 6 | **CO6.** Implement the applications on AWS cloud. | PO1, PO6, PO8, PO12,PSO1, PSO2, PSO3 |

**PO and PSO mapping with level of strength for Course Name** Cloud Storage and Virtualization **(Course Code )**

| Cos | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| CO1 | 3 | 2 | 2 | 2 | - | - | - | - | - | - | - | 3 | 3 | - | 3 |
| CO2 | 3 | 2 | 2 | 2 | - | - | - | - | - | - | - | 3 | - | 3 | 2 |
| CO3 | 3 | 2 | 2 | 2 | - | - | - | - | - | - | - | 3 | - | 2 | 3 |
| CO4 | 3 | 2 | 2 | 2 | - | - | - | - | - | - | - | 3 | - | 3 | 2 |
| CO5 | 3 | 3 | 3 | 2 | - | 2 | - | 2 | - | - | - | 3 | - | 3 | 3 |
| CO6 | 3 | 3 | 3 | 2 | - | 2 | - | 2 | - | - | - | 3 | 3 | 3 | 3 |
| Avg | 3.00 | 2.33 | 2.33 | 2.00 | - | 2.00 | - | 2.00 | - | - | - | 3.00 | 3.00 | 2.80 | 2.67 |

***Average of non-zeros entry in following table (should be auto calculated).***

| **Course Code** | **Course Name** | **PO 1** | **PO2** | **PO 3** | **PO 4** | **PO 5** | **PO 6** | **PO 7** | **PO 8** | **PO 9** | **PO 10** | **PO 11** | **PO 12** | **PSO 1** | **PSO 2** | **PSO 3** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Cloud Storage and Virtualization | 3.00 | 2.33 | 2.33 | 2.00 | - | 2.00 | - | 2.00 | - | - | - | 3.00 | 3.00 | 2.80 | 2.67 |