SHARDA UNIVERSITY
Beyond Boundaries

NAAC A+ ACCREDITED

SHARDA SCHOOL OF ENGINEERING & TECHNOLOGY

COURSE

# Cloud Technologies & Role of Hypervisor in Virtualization

(VAT114)

**VALUE ADDED COURSE BROCHURE-30 HRS**

**2024-25**

# ABOUT THE UNIVERSITY

Sharda University is a leading Educational institution based out of Greater Noida, Delhi NCR. A venture of the renowned Sharda Group of Institutions (SGI), The University has established itself as a high quality education provider with prime focus on holistic learning and imbibing competitive abilities in students.

## ABOUT SCHOOL

Sharda School of Engineering and technology is an open platform for diverse voices where teaching runs parallel to the real world and students are groomed to join the global workforce. SSET is distinguished as one of the top-ranked engineering schools in India. The students at SSET benefit through the professional grooming of renowned faculty and industry experts having experience of tackling pressing engineering problems. Students discover their passion in one of the various offered Engineering majors at the School of Engineering and technology.

## ABOUT DEPARTMENT

The Department of Computer Science and Applications strives to equip faculty and students with all the computing resources needed to address a wide range of scientific, technological, and socially complex problems. The department imparts technical education for designing quirky technological applications and innovations. The department grails to become a center of excellence and impart knowledge to intellectual professionals so as to equip them with the requisite skills as per Industry standards. The department aims to foster an innovative research environment by providing a supportive, amiable, and challenge-based learning culture. The department utilizes high-performance computing equipment and facilities to impart state-of-the-art technical knowledge to students and instill a desire to pursue lifelong learning. To emerge as a world-class department, we focus on innovative research and quality learning in computer science applications that prepares entrepreneurs and professionals to lead the social, economic, and technical development of society. The department enjoys the full patronage of the Chancellor, Vice-Chancellor, Pro-Vice-Chancellor, and the director of the School of Engineering (SET) where it is housed presently.

## VALUE ADDED COURSE (VAC)

The Value added Education Courses aim to provide additional learner centric graded skill oriented training, with the primary objective of improving the employability skills of students.

## PURPOSE OF VALUE ADDED COURSE

VACs are pertinent instructional strategies designed to close knowledge gaps in students and provide them a competitive edge in the Job market. The courses' well-defined offspring VACs make them incredibly helpful for enhancing Students' employability quotient by developing a variety of competencies. It aids pupils in laying the creative groundwork for a passion project.(computers project, quantitative analytics,etc) aside from their occupation courses offering characteristics that can assist in transforming their enthusiasm into occupation. Students can understand basic concepts and terminology of cloud technologies in the current IT environment. Students can classify and analyze the terms of virtualization and its types along with services, types, and challenges with cloud applications.

## RESOURCE PERSON

**Dr. Syed Arshad Ali** is working as an Assistant Professor in the Department of Computer Science and Applications at Sharda University with a passion for teaching and research, Dr. Arshad brings a wealth of expertise and knowledge to the field of computer science. He received his PhD degree in Computer Science from Jamia Millia Islamia, New Delhi. He received his Master of Computer Application (MCA) degree from Jamia Hamdard, New Delhi and Bachelor of Computer Application (BCA) degree from C.S.J.M. University, Kanpur. He has also qualified UGC, National Eligibility Test (NET) with JRF. In addition to journal articles and conference papers, his publications include book chapters and book reviews. He has also reviewed many research articles of reputed journals and conferences. In addition to Cloud Computing, Internet of Things, and Machine Learning, he is also interested in other areas of research.

## COURSE SCHEDULE

| Unit | Content | Duration |
|---|---|---|
| 1 | History and Evolution of Cloud Computing | 2 h |
| 2 | Types of clouds | 2 h |
| 3 | Cloud Computing Architecture | 2 h |
| 4 | Define Virtualization, Need Virtualization | 2 h |
| 5 | Comparing Virtualized and Non- Virtualized Environments | 2 h |
| 6 | Understanding Virtualization Technologies | 2 h |
| 7 | Benefits of VDI | 2 h |
| 8 | Introduction to virtual machine, various components of virtual machine | 2 h |
| 9 | Different types of Hypervisor management application | 2 h |
| 10 | Virtualization: Characteristics, | 2 h |
| 11 | Hypervisor in virtualization | 2 h |
| 12 | Virtualization: foundational issues | 2 h |
| 13 | Vulnerabilities and Attacks | 2 h |
| 14 | Hypervisor Security, Storage | 2 h |
| 15 | Cloud Security Mechanisms, Data Security | 2 h |
| **Total** | | **30 h** |

**Data Analytics Using AWS** Course Coverage (Total Hours: 30)

| School: SSET<br>Program: BCA/B.Sc<br>Branch: | Batch : 2021-24<br>Current Academic Year: 2024-25<br>Semester: V | |
|---|---|---|
| **1.** Course Code | VAT 114 | |
| **2.** Course Title | Cloud Technologies & Role of Hypervisor in Virtualization | |
| **3.** Credits | 0 | |
| **4.** Contact Hours (L-T-P) | 30 Hours | |
| Course Type | Value added course | |
| **5.** Course Objective | Students can understand basic concepts and terminology of cloud technologies in the current IT environment. Students can classify and analyze the terms of virtualization and its types along with services, types, and challenges with cloud applications | |
| **6.** Course Outcomes | Co1: Explain 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.<br>CO2: Classify and analyze the terms of virtualization and its types along with services, types and challenges with cloud applications<br>Co3: Discuss system, network and storage virtualization and outline their role in enabling the cloud computing system mode<br>Co4: Illustrate the fundamental concepts of hypervisors and demonstrate their use in clod such as Azure<br>Co5: Analyze various cloud programming models and apply them to solve problems on the cloud | |
| **7.** Course Description | This course offers students a comprehensive understanding of virtualization technologies and their application in cloud computing environments. Through this course, students will learn the principles and techniques of virtualization, including virtual machines, containers, and virtual networks, and explore how virtualization enables efficient resource utilization, scalability, and flexibility in cloud environments. Students will gain hands-on experience in deploying and managing virtualized infrastructure using popular cloud platforms | |
| **8.** Outline syllabus | | CO Mapping |
| **Unit 1** | **Introduction to Virtualization** | |
| A | History and Evolution of Cloud Computing | CO1 |
| B | Types of clouds | CO1 |
| C | Cloud Computing Architecture | CO1, CO2 |
| **Unit 2** | **Introduction to Virtualization** | |
| A | Define Virtualization, Need Virtualization | CO2, CO3 |
| B | Comparing Virtualized and Non- Virtualized Environments | CO2, CO3 |
| C | Understanding Virtualization Technologies | CO2, CO3 |
| **Unit 3** | **Virtualization Technology terms & techniques** | |
| A | Benefits of VDI | CO3 |
| B | Introduction to virtual machine, various components of virtual machine | CO3 |
| C | Different types of Hypervisor management application | CO1, CO3 |
| **Unit 4** | **Virtualization and the Cloud** | |
| A | Virtualization: Characteristics, | CO2, CO |
| B | Hypervisor in virtualization | CO3 |
| C | Virtualization: foundational issues | CO4, CO5 |
| **Unit 5** | **Security Essential in Cloud and Virtualization** | |
| A | Vulnerabilities and Attacks | CO1, CO5 |
| B | Hypervisor Security, Storage | CO5, CO5 |
| C | Cloud Security Mechanisms, Data Security | CO5 |
| Mode of examination | Jury/Practical/Viva | |
| Text Books | References<br>1. CLOUD COMPUTING Principles and Paradigms, Edited by Rajkumar Buyya, Jam<br>2. Cloud Computing: A Practical Approach, Anthony T. Velte, Toby J. Velte, Robert Elsenpeter | |
| Reference Books | Amazon SageMaker, Developer Guide, https://docs.aws.amazon.com/sagemaker/latest/dg/sagemaker-dg.pdf#gs | |
| Online Materials | https://aws.amazon.com/getting-started/hands-on/build-train-deploy-machine-learning-model-sagemaker/<br>https://aws.amazon.com/machine-learning/ | |