


STORAGE AREA NETWORKS [As per Choice Based Credit System (CBCS) scheme] (Effective from the academic year 2016 -2017) SEMESTER – VII			
Subject Code	15CS754	IA Marks	20
Number of Lecture Hours/Week	3	Exam Marks	80
Total Number of Lecture Hours	40	Exam Hours	03
CREDITS – 03			
Course objectives: This course will enable students to <ul style="list-style-type: none"> • Evaluate storage architectures, • Define backup, recovery, disaster recovery, business continuity, and replication • Examine emerging technologies including IP-SAN • Understand logical and physical components of a storage infrastructure • Identify components of managing and monitoring the data center • Define information security and identify different storage virtualization technologies 			
Module – 1			Teaching Hours
Storage System Introduction to Information Storage: Evolution of Storage Architecture, Data Center Infrastructure, Virtualization and Cloud Computing. Data Center Environment: Application, Host (Compute), Connectivity, Storage. Data Protection: RAID: RAID Implementation Methods, RAID Techniques, RAID Levels, RAID Impact on Disk Performance. Intelligent Storage Systems: Components of Intelligent Storage System, Storage Provisioning. Text Book-1 Ch1: 1.2 to 1.4, Ch2: 2.1, 2.3 to 2.5, Ch3: 3.1, 3.3 to 3.5, Ch4: 4.1 and 4.2			8 Hours
Module – 2			
Storage Networking Technologies Fibre Channel Storage Area Networks: Components of FC SAN, FC connectivity, Fibre Channel Architecture, Zoning, FC SAN Topologies, Virtualization in SAN. IP SAN and FCoE: iSCSI, FCIP, FCoE. Network Attached Storage: Components of NAS, NAS I/O Operation, NAS File-Sharing Protocols, File-Level Virtualization, Object-Based Storage and Unified Storage: Object-Based Storage Devices, Content-Addressed Storage, Unified Storage. Text Book-1 Ch5: 5.3, 5.4, 5.6, 5.9 to 5.11, Ch6: 6.1 to 6.3, Ch7: 7.4, 7.5, 7.7 and 7.9 Ch8: 8.1, 8.2 and 8.4			8 Hours
Module – 3			
Backup, Archive and Replication Introduction to Business Continuity: Information Availability, BC Terminology, BC Planning Lifecycle, Failure Analysis, BC Technology Solutions. Backup and Archive: Backup Methods, Backup Topologies, Backup Targets, Data Deduplication for Backup, Backup in Virtualized Environments, Data Archive. Local Replication: Replication Terminology, Uses of Local Replicas, Local Replication Technologies, Local Replication in a Virtualized Environment. Remote Replication: Remote Replication Technologies, Three-Site Replication, Remote Replication and			8 Hours

Migration in a Virtualized Environment.	
Text Book-1 Ch10: 10.5, 10.8, 10.10 to 10.13, Ch11: 11.1, 11.2, 11.4 and 11.8, Ch12: 12.2, 12.3 and 12.5	
Module – 4	
Cloud Computing and Virtualization Cloud Enabling Technologies, Characteristics of Cloud Computing, Benefits of Cloud Computing, Cloud Service Models, Cloud Deployment Models, Cloud Computing Infrastructure, Cloud Challenges and Cloud Adoption Considerations. Virtualization Appliances: Black Box Virtualization, In-Band Virtualization Appliances, Out-of-Band Virtualization Appliances, High Availability for Virtualization Appliances, Appliances for Mass Consumption. Storage Automation and Virtualization: Policy-Based Storage Management, Application-Aware Storage Virtualization, Virtualization-Aware Applications.	8 Hours
Text Book-1 Ch13: 13.1 to 13.8. Text Book-2 Ch9: 9.1 to 9.5 Ch13: 13.1 to 13.3	
Module – 5	
Securing and Managing Storage Infrastructure Securing and Storage Infrastructure: Information Security Framework, Risk Triad, Storage Security Domains, Security Implementations in Storage Networking, Securing Storage Infrastructure in Virtualized and Cloud Environments. Managing the Storage Infrastructure Monitoring the Storage Infrastructure, Storage Infrastructure Management activities, Storage Infrastructure Management Challenges, Information Lifecycle management, Storage Tiering.	8 Hours
Text Book-1 Ch14: 14.1 to 14.5, Ch15: 15.1 to 15.3, 15.5 and 15.6	
Course outcomes: The students should be able to:	
<ul style="list-style-type: none"> Identify key challenges in managing information and analyze different storage networking technologies and virtualization Explain components and the implementation of NAS Describe CAS architecture and types of archives and forms of virtualization Illustrate the storage infrastructure and management activities 	
Question paper pattern: The question paper will have ten questions. There will be 2 questions from each module. Each question will have questions covering all the topics under a module. The students will have to answer 5 full questions, selecting one full question from each module.	
Text Books:	
1. Information Storage and Management, Author :EMC Education Services, Publisher: Wiley ISBN: 9781118094839 2. Storage Virtualization, Author: Clark Tom, Publisher: Addison Wesley Publishing Company ISBN : 9780321262516	
Reference Books:	
NIL	


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