INFORMATION STORAGE SYSTEMS
(ELECTIVE-I)

Course Code: 15IT2108

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Pre requisites:
1. Database Management Systems.
2. Computer Organization.
3. Operating Systems.

Course Outcomes:
At the end of the course, a student will be able to:
CO1: Summarize storage requirements.
CO2: Compute disk performance.
CO3: Classify storage solutions.
CO4: Apply storage connectivity technologies.
CO5: Differentiate network-attached and object-based storage.

UNIT-I (10-Lectures)

Introduction to Information Storage: Information Storage, Evolution of Storage Architecture, Data Center Infrastructure, Virtualization and Cloud Computing.

Data Center Environment: Application, Database Management System (DBMS), Host (Compute), Connectivity, Storage, Disk Drive Components, Disk Drive Performance, Host Access to Data, Direct-Attached Storage , Storage Design Based on Application Requirements and Disk Performance, Disk Native Command Queuing , Introduction to Flash Drives, Concept in Practice: VMware ESXi.

UNIT-II (10-Lectures)

Data Protection: RAID: RAID Implementation Methods, RAID Array Components, RAID Techniques, RAID Levels, RAID Impact on Disk Performance, RAID Comparison, Hot Spares.

Intelligent Storage Systems: I Components of an Intelligent Storage System, Storage Provisioning, Types of Intelligent Storage Systems, Concepts in Practice: EMC Symmetrix and VNX.
Storage Networking Technologies.

UNIT-III (10-Lectures)
Fibre Channel Storage Area Networks: Fibre Channel: Overview, The SAN and Its Evolution, Components of FC SAN , FC Connectivity, Switched Fabric Ports, Fibre Channel Architecture, Fabric Services , Switched Fabric Login Types, Zoning, FC SAN Topologies, Virtualization in SAN, Concepts in Practice: EMC Connectrix and EMC VPLEX .

UNIT-IV (10-Lectures)
IP SAN and FCoE: FCIP, FCoE.
Network-Attached Storage : General-Purpose Servers versus NAS Devices, Benefits of NAS, File Systems and Network File Sharing, Components of NAS, NAS I/O Operation, NAS Implementations, NAS File-Sharing Protocols, Factors Affecting NAS Performance, File-Level Virtualization, Concepts in Practice: EMC Isilon and EMC VNX Gateway.

UNIT-V (10-Lectures)
Object-Based and Unified Storage: Object-Based Storage Devices, Content-Addressed Storage, CAS Use Cases, Unified Storage, Concepts in Practice: EMC Atmos, EMC VNX, and EMC Centera.

TEXT BOOKS:
1. G.Somasundaram, A.Shrivastava: EMC Corporation, "Information Storage and Management: Storing, Managing and Protecting Digital Information in Classic, Virtualized and Cloud Environment," 2nd Edition, Wiley publication, 2012.
2. Robert Spalding, "Storage Networks: The Complete Reference", 1st Edition, Tata McGraw Hill/Osborne, 2003.

REFERENCES:

1. Marc Farley, “Building Storage Networks”, 2nd Edition, Tata McGraw Hill/Osborne, 2001.
2. Meeta Gupta: “Storage Area Network Fundamentals”, 1st Edition, Pearson Education, 2002.

WEB REFERENCES:

www.education.emc.com