Course Competency

CIS 4347 Information Storage Management

Course Description

This upper division course, for students majoring in Information Systems Technology, introduces challenges and solutions for data storage and data management. Students will learn how to manage advanced storage systems, protocols, and architectures, including storage area networks (SAN), network attached storage (NAS), fiber channel networks, internet protocol SANS (IPSAN), ISCSI, and content-addressable storage (CAS). Prerequisite: CTS1134 or CTS1650. (3 hr. lecture, 2 hr. lab)

Course Competency	Learning Outcomes
Competency 1: The student will analyze and evaluate the key characteristics, services, deployment models, and infrastructure components for a cloud computing environment by:	
1. Examining the role of information storage and management to the business. 2. Analyzing the key components and requirements of a classic and virtualized data center infrastructure. 3. Examining the characteristics of cloud computing. 4. Analyzing effective cloud computing deployment models for businesses. 5. Distinguishing cloud infrastructure components and migration considerations. 6. Evaluating various cloud storage networking solutions based on application requirements. 7. Comparing and contrasting different deployment models (e.g., private, public, and hybrid) and services offerings.	
Competency 2: The student will examine storage architectures and key data center elements in classic, virtualized, and cloud environments by:	
1. Analyzing the amount of data created within the organization. 2. Prioritizing the value of data to a business.	

3. Analyzing key data center infrastructure elements. 4. Evaluating the role of each element in supporting business activities. 5. Applying the role of Information Lifecycle Management (ILM) strategy. 6. Classifyingphysical and logical components of the storage environment.	
Competency 3: The student will examine the physical and logical components of a storage infrastructure by:	
1. Evaluating the various disk drive architectures and performances. 2. Describing the concept of redundant array of independent disks (RAID) and different RAID levels (RAID 0, 1, 3, 5, 0+1/1+0, and 6). 3. Examining the features, components, and applicationof Intelligent Storage Systems (ISS). 4. Configuring ISS high-end and midrange storage arrays.	
Competency 4: The student will analyze and evaluate storage networking technologies, object-based and unified storage by:	
1. Examining the components, protocol, and operations of: 2. Examining the application of content addressable storage (CAS) as a long-term archiving solution. 3. Analyzing block-level and file-level storage virtualization technologies. 4. Evaluating emerging technologies such as cloud storage, virtual provisioning, object based storage, unified storage, Fiber Channel over Ethernet (FCOE), fully automated storage tiering (FAST), etc. and their applications in an information storage system. 5. Direct Attached Storage (DAS). 6. Fiber Channel (FC) and IP Storage Area Networks (SAN).	

7. Networked Attached Storage (NAS). 8. Content-Addressed Storage (CAS).	
Competency 5: The student will examine business continuity solutions by:	
1. Describing the concept of information availability. 2. Analyzing the backup/recovery purposes and consequences of system unavailability. 3. Analyzing a recovery time objective (RTO) and recovery point objective (RPO). 4. Evaluating clustering and multipathing architecture to avoid single points of failure in a storage infrastructure and solutions for its mitigation. 5. Comparing backup and recovery methods, targets, and topologies. 6. Examining data backup in a virtualized environment. 7. Comparing local replication in classic and virtual environments. 8. Comparing three-site remote replication and continuous data protection.	

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