

Montgomery County Community College  
 CIS 167  
 Introduction to Data Storage and Storage Area Networks  
 3-2-2

**COURSE DESCRIPTION:**

This course will teach a student the knowledge and skills required to configure basic storage networks to include archive, backup, and restoration technologies. Students will also learn about the fundamentals of business continuity, application workload, system integration, and storage/system administration, while performing basic troubleshooting on connectivity issues and referencing documentation. The course will also cover the objectives of the CompTIA Storage + certification examination.

**REQUISITES:**

*Previous Course Requirements*  
 None

*Concurrent Course Requirements*  
 None

LEARNING OUTCOMES Upon successful completion of this course, the student will be able to:	LEARNING ACTIVITIES	EVALUATION METHODS
1. Explain concepts of Storage Components.	Lecture/Discussion Homework Assignments Assigned readings Research	Discussion/Questions Research Presentations Chapter Quiz
2. Configure storage network connectivity.	Lecture/Discussion Hands on Labs Homework Assignments Assigned readings Research	Discussion/Questions Research Presentations Chapter Quiz
3. Explain storage management, general virtualization and Virtual storage.	Lecture/Discussion Homework Assignments Assigned readings Research	Discussion/Questions Research presentations Chapter Quiz
4. Explain data protection and redundancy.	Lecture/Discussion Homework Assignments Assigned readings Research	Discussion/Questions Research presentations Chapter Quiz
5. Examine storage workload and performance.	Lecture/Discussion – Hands on Labs Homework Assignments Assigned readings Research	Discussion/Questions Research presentations Chapter Quiz Final Skills assessment and written final exam.

At the conclusion of each semester/session, assessment of the learning outcomes will be completed by course faculty using the listed evaluation method(s). Aggregated results will be submitted to the Associate Vice President of Academic Affairs. The benchmark for each learning outcome is that *70% of students will meet or exceed outcome criteria*.

## SEQUENCE OF TOPICS:

### **Storage Components**

- Disk types, components, and features.
- Compare removable media types, components, and features.
- Install and maintain connectors and cable types
- Uses of physical networking hardware.
- Install and maintain modular storage array components.
- Identification of environmental concerns and their associated impacts.
- Safety techniques during installation and maintenance of storage equipment.

### **Connectivity**

- Storage networking terminology.
- Implementing fibre channel technologies.
- Implementation of Ethernet network technologies.
- Converged storage network technologies.
- Use of network tools.
- Troubleshooting common networking problems.

### **Storage Management**

- RAID levels and features.
- Storage provisioning techniques.
- Volume management concepts.
- General virtualization concepts.
- Monitoring, alerting, and reporting.
- Management protocols and interfaces.
- Functions and differences of de-duplication and compression.

### **Data Protection and Redundancy**

- Redundancy concepts, associated purposes, and components.
- Replication methods and properties.

- Data backup concepts for long term storage.
- Concepts and importance of data security.

### **Storage Workload and Performance**

- Impact of latency and throughput on storage performance.
- Concepts of tuning and workload balance.
- Properties of storage device bandwidth and functions.
- Network device bandwidth.
- Performance metrics, parameters, and purposes of storage/host tools.

### **LEARNING MATERIALS:**

Poulton (2013). *Data Storage Networking*. Sybex. ISBN-10: 1118679210

Students will have free access to EMC data storage software in the lab.

### **COURSE APPROVAL:**

Prepared by: Anil Datta

Date: 9/6/2013

VPAA/Provost Compliance Verification:

Victoria Bastecki-Perez, Ed. D.

Date: 1/2014

*This course is consistent with Montgomery County Community College's mission. It was developed, approved and will be delivered in full compliance with the policies and procedures established by the College.*