SAN DIEGO COMMUNITY COLLEGE DISTRICT
CONTINUING EDUCATION
COURSE OUTLINE

SECTION I

SUBJECT AREA AND COURSE NUMBER

COMP 642

COURSE TITLE

SERVER ADMIN FUNDAMENTALS

TYPE COURSE

NON-FEE / VOCATIONAL

CATALOG COURSE DESCRIPTION

This course includes the installation, configuration, and management of the Windows Server Operating System. Students will learn about server administration tools, Active Directory**,** account management and security, and server performance troubleshooting. Students will be introduced to network services, web servers, and DNS servers. (FT)

LECTURE/LABORATORY HOURS

125

ADVISORY

Microcomputer Basics or equivalent.

RECOMMENDED SKILL LEVEL

Possess a 10th grade reading level; ability to communicate effectively in the English language; knowledge of math concepts at the 8th grade level and basic computer literacy.

INSTITUTIONAL STUDENT LEARNING OUTCOMES

1. Social Responsibility
   SDCE students demonstrate interpersonal skills by learning and working cooperatively in a diverse environment.
2. Effective Communication
   SDCE students demonstrate effective communication skills.

INSTITUTIONAL STUDENT LEARNING OUTCOMES (CONTINUED)

3. Critical Thinking
   SDCE students critically process information, make decisions, and solve problems independently or cooperatively.
4. Personal and Professional Development
   SDCE students pursue short term and life-long learning goals, mastering necessary skills and using resource management and self-advocacy skills to cope with changing situations in their lives.

COURSE GOALS

1. Introduce the Windows Server Operating System environment.
2. Learn about the different installation options.
3. Understand and manage storage technologies.
4. Learn the use of administrative tools.
5. Learn the use of the control panel.
6. Learn how to manage system services.
7. Learn how to setup and manage server roles.
8. Understand and manage an Active Directory domain.
9. Understand and employ appropriate troubleshooting methodology.
10. Understand and manage business continuity and recovery.

COURSE OBJECTIVES

Upon successful completion of this course, students will be able to:
1. Compare and describe server and desktop operating systems.
2. Demonstrate the installation and configuration of the operating system.
3. Demonstrate how to modify the operating system using the control panel and Administrative tools.
4. Demonstrate how to modify and configure the file system to provide client access.
5. Demonstrate how to modify the network configuration to provide client access.
6. Analyze common server and network misconfigurations and apply the appropriate fix.
7. Identify and configure common server roles.
8. Demonstrate how to create an Active Directory domain.

SECTION II

COURSE CONTENT AND SCOPE

1. Server Installation
   - 1.1. Device drivers
     - 1.1.1. Installation
     - 1.1.2. Removal
     - 1.1.3. Disabling
     - 1.1.4. Update/upgrade
     - 1.1.5. Rollback
     - 1.1.6. Troubleshooting

COURSE CONTENT AND SCOPE (CONTINUED)

- 1.1.7. Plug and play (PnP)
- 1.1.8. IRQ
- 1.1.9. Interrupts
- 1.1.10. Driver signing

1.2. Services
- 1.2.1. What services are
- 1.2.2. Which statuses a service can be in
- 1.2.3. Startup types
- 1.2.4. Recovery options
- 1.2.5. Delayed startup
- 1.2.6. Run-As settings for a service
- 1.2.7. Stopping or pausing a service
- 1.2.8. Service accounts
- 1.2.9. Dependencies

1.3. Server installation options
- 1.3.1. Choosing correct operating system (OS) version
- 1.3.2. Partitioning
- 1.3.3. F8 options
- 1.3.4. Server core vs. full
- 1.3.5. Interactive install
- 1.3.6. Unattended install
- 1.3.7. Automated install using Windows Deployment Service (WDS)
- 1.3.8. Upgrade vs. clean install
- 1.3.9. Firmware updates including BIOS

2. Server Roles

2.1. Application servers
- 2.1.1. Mail servers
- 2.1.2. Database servers
- 2.1.3. Collaboration servers
- 2.1.4. Monitoring servers
- 2.1.5. Threat management

2.2. Web Services
- 2.2.1. Internet Information Services, WWW, and FTP
- 2.2.2. Worker processes
- 2.2.3. Adding components
- 2.2.4. Sites
- 2.2.5. Listening ports
- 2.2.6. SSL and server certificates

2.3. Remote Access
- 2.3.1. Remote assistance
- 2.3.2. Remote administration tools
- 2.3.3. Remote Desktop Services
- 2.3.4. Licensing
- 2.3.5. RD Gateway
- 2.3.6. VPN
- 2.3.7. Application virtualization
- 2.3.8. Multiple ports

COURSE CONTENT AND SCOPE (CONTINUED)

- 2.4. File and print services
  - 2.4.1. Local printers and network printers
  - 2.4.2. Printer pools
  - 2.4.3. Web printing
  - 2.4.4. Web management
  - 2.4.5. Driver deployment
  - 2.4.6. File, folder, and share permissions vs. rights
  - 2.4.7. Auditing
  - 2.4.8. Print job management
- 2.5. Server virtualization
  - 2.5.1. Virtualization modes
  - 2.5.2. VHDs
  - 2.5.3. Virtual memory
  - 2.5.4. Virtual networks
  - 2.5.5. Snapshots and saved states
  - 2.5.6. Physical-to-virtual and virtual-to-physical

3. Active Directory
- 3.1. Accounts and groups
  - 3.1.1. Domain accounts
  - 3.1.2. Local accounts
  - 3.1.3. User profiles
  - 3.1.4. Group types
  - 3.1.5. Group scopes
  - 3.1.6. Group nesting
- 3.2. Organizational Units (OUs) and containers
  - 3.2.1. Purpose of OUs
  - 3.2.2. Purpose of containers
  - 3.2.3. Delegation
  - 3.2.4. Default
- 3.3. Active directory infrastructure
  - 3.3.1. Domain controllers
  - 3.3.2. Forests
  - 3.3.3. Operation masters roles
  - 3.3.4. Domain vs. workgroup
  - 3.3.5. Child domains
  - 3.3.6. Trusts
  - 3.3.7. Functional level
  - 3.3.8. Namespace
  - 3.3.9. Sites
  - 3.3.10. Replication
- 3.4. Group policy
  - 3.4.1. Group policy processing
  - 3.4.2. Group Policy Management Console
  - 3.4.3. Computer policies
  - 3.4.4. User policies
  - 3.4.5. Local policies

COURSE CONTENT AND SCOPE (CONTINUED)

4. Storage
   - 4.1. Storage technologies
     - 4.1.1. Advantages and disadvantages of different storage types
     - 4.1.2. Local (SATA, SCSI, IDE)
     - 4.1.3. NAS
     - 4.1.4. SAN
     - 4.1.5. Fibre channel
     - 4.1.6. iSCSI
     - 4.1.7. NFS
     - 4.1.8. FC HBA and FC switches
     - 4.1.9. iSCSI hardware
   - 4.2. RAID
     - 4.2.1. RAID levels including 0, 1, 5, 10 and combinations
     - 4.2.2. Hardware and software RAID
   - 4.3. Disk types
     - 4.3.1. Basic disk
     - 4.3.2. Dynamic disk
     - 4.3.3. Mount points
     - 4.3.4. File systems
     - 4.3.5. Mounting a virtual hard disk
     - 4.3.6. Distributed file systems
     - 4.3.7. Optical disks
5. Server Performance Management
   - 5.1. Major server hardware components
     - 5.1.1. Memory
     - 5.1.2. Disk
     - 5.1.3. Processor
     - 5.1.4. Network
     - 5.1.5. 32 and 64 bit systems
     - 5.1.6. Removable drives
     - 5.1.7. Graphic cards
     - 5.1.8. Cooling
     - 5.1.9. Power usage
     - 5.1.10. Ports
   - 5.2. Performance monitoring
     - 5.2.1. Methodology
     - 5.2.2. Procedures
     - 5.2.3. Creating a baseline
     - 5.2.4. Performance Monitor (Perfmon)
     - 5.2.5. Resource monitor
     - 5.2.6. Task manager
     - 5.2.7. Performance counters
   - 5.3. Logs and alerts
     - 5.3.1. Purpose of performance logs and alerts

COURSE CONTENT AND SCOPE (CONTINUED)

6. Server Maintenance
   - 6.1. Steps in the startup process
     - 6.1.1. BIOS
     - 6.1.2. Bootsector
     - 6.1.3. Bootloader
     - 6.1.4. MBR
     - 6.1.5. Boot.ini
     - 6.1.6. BCDEdit
     - 6.1.7. POST
     - 6.1.8. Safe Mode
   - 6.2. Business continuity
     - 6.2.1. Backup and restore
     - 6.2.2. Disaster recovery
     - 6.2.3. Clustering
     - 6.2.4. Active Directory restore
     - 6.2.5. Folder redirection
     - 6.2.6. Data redundancy
     - 6.2.7. Uninterruptible power supply (UPS)
   - 6.3. Updates
     - 6.3.1. Software
     - 6.3.2. Driver
     - 6.3.3. Operating systems
     - 6.3.4. Applications
     - 6.3.5. Windows update
     - 6.3.6. Windows Server Update Services (WSUS)
   - 6.4. Troubleshooting methodology
     - 6.4.1. Processes
     - 6.4.2. Procedures
     - 6.4.3. Best practices
     - 6.4.4. Systematic vs. specific approach
     - 6.4.5. Perfmon
     - 6.4.6. Event viewer
     - 6.4.7. Resource monitor
     - 6.4.8. Information Technology Infrastructure Library
     - 6.4.9. Central logging
     - 6.4.10. Event filtering
     - 6.4.11. Default logs

APPROPRIATE READINGS

Appropriate readings may include, but are not limited to, periodicals, magazines, instructor-written materials, manuals, instructor selected URLs, and publications related to the implementation of server operating systems.

WRITING ASSIGNMENTS

Appropriate writing assignments may include, but are not limited to, preparing text for an assigned project, documenting all laboratories and project work, and completing all written assigned reports.

OUTSIDE ASSIGNMENTS

Outside assignments may include, but are not limited to, reading texts and reference resources; research as needed to complete projects; and organizing and preparing written answers to assigned questions.

APPROPRIATE ASSIGNMENTS THAT DEMONSTRATE CRITICAL THINKING

Assignments which demonstrate critical thinking may include, but are not limited to, analysis and evaluation of assigned text and reference resources, and utilize this analysis in classroom discussions, writing assignments, and in performing laboratory activities. Students must select appropriate methods and resources needed to complete laboratory assignments.

EVALUATION

A student's grade will be based on multiple measures of performance and will include evaluation of student's ability to:

1. Perform in a variety of activities and assignments related to the course objectives.
2. Complete written and practical examinations.
3. Contribute to class and group discussions.
4. Maintain attendance and punctuality per current policy.
5. Demonstrate ability to work independently and as a team member.
6. Demonstrate troubleshooting skills.

Upon successful completion of each course in the program, a Certificate of Course Completion will be issued. Upon successful completion of both courses included in the program, a Certificate of Program Completion will be issued.

METHOD OF INSTRUCTION

Methods of instruction may include, but are not limited to, lectures, self-paced lab, demonstrations, individualized study, use of audio-visual aids, group/team work, tutorials, outside assignments, guest lectures, field trips, and guided student job assignments. This course, or sections of this course, may be offered through distance education.

TEXTS AND SUPPLIES

Windows Server ® Administration Fundamentals, Exam 98-365, Microsoft Official Academic Course, John Wiley & Sons, current edition

Mastering Windows Server 2008 Networking Foundations, Mark Minasi, Wiley Publishing, current edition

TEXTS AND SUPPLIES (CONTINUED)

Mastering Microsoft Windows Server 2008 R2, Mark Minasi, Wiley Publishing, current edition
Professional IIS 7, Kenneth Schaefer, Jeff Cochran, Scott Forsyth, Rob Baugh, Mike Everest, Dennis Glendenning, WROX, current edition
Web Resources: http://technet.microsoft.com; http://www.techrepublic.com; http://www.microsoftvirtualacademy.com; https://www.microsoft.com/learning

Supplies: Journal (composition book), USB Drive or other storage media

PREPARED BY: Richard Gholson DATE: 11/10/2014

REVISED BY: _____ DATE: _____

Instructors must meet all requirements stated in Policy 3100 (Student Rights, Responsibilities and Administrative Due Process), and the Attendance Policy set forth in the Continuing Education Catalog.

REFERENCES:

San Diego Community College District Policy 3100
California Community Colleges, Title 5, Section 55002
Continuing Education Catalog