ADVANCED COMPUTER OPERATING SYSTEMS
COURSE CODE: 5322

COURSE DESCRIPTION: In the Advanced Computer Operating Systems course, students will gain the knowledge and skills required to install and configure Windows 10 desktops and devices in a Windows Server domain corporate environment. They earn how to configure local and remote network connectivity and storage, explore how to configure data security, device security, and network security. In addition students will discover how to maintain, update, and recover Windows 10.

OBJECTIVE: Given the necessary equipment, supplies, and facilities, the student will be able to successfully complete all of the following core standards for a course that grants one unit of credit.

RECOMMENDED GRADE LEVELS: 11-12

COURSE CREDIT: 1 (120 hours) or 2 (240 hours) units

PREREQUISITE(S): Computer Repair and Service and/or passing score on applicable industry certification such as CompTIA A+ 220-901, 220-902

COMPUTER REQUIREMENT: One computer per student; Internet access

RESOURCES: Materials and Resources

CERTIFICATION:

This course corresponds to the Microsoft exam 70-697. The Computer Operating System course (course code: 5322) corresponds to the Microsoft exam 70-698. Students who pass both exams will earn the Microsoft Certified Solutions Associate Windows 10 certificate.

OTHER: Computer service technology programs may choose to articulate with postsecondary institutions for completion of some advanced level competencies.

A – E follows N

F. MANAGE IDENTITY

Effective Information Technology professionals demonstrate proficiency in managing identity resources via the operating system. The following accountability criteria are considered essential for students in the Information Support and Services and Networking Services programs of study.

1. **Support Microsoft Store, Microsoft Store for Education, Microsoft Store for Business, and cloud apps.**
   a. Install and manage software by using Microsoft Office 365, Microsoft Store for Business apps, or Microsoft Store for Education apps.
   b. Sideload apps by using Microsoft Intune; sideload apps into online and offline images; deeplink apps by using Microsoft Intune.
   c. Integrate Microsoft account, including personalization settings.

2. **Support authentication and authorization.**
   a. Identify and resolve issues related to multi-factor authentication, Windows Hello for Business, virtual smart cards, picture passwords, and biometrics.
   b. Implement workgroup and domain authentication.
   c. Implement Homegroup.
   d. Configure computer and user authentication using secure channel, account policies, credential caching, and Credential Manager.
   e. Implement local accounts and Microsoft accounts.
   f. Configure Windows Hello for Business.
   g. Implement Azure AD Join.
   h. Connect Microsoft accounts to domain accounts

G. PLAN DESKTOP AND DEVICE DEPLOYMENT

Effective Information Technology professionals demonstrate proficiency in planning desktop and device deployment via the operating system. The following accountability criteria are considered essential for students in the Information Support and Services and Networking Services programs of study.

1. **Migrate and configure user data**.
   a. Migrate user profiles.
   b. Configure folder location.
   c. Configure profiles, including profile version, local, roaming, and mandatory.
2. **Configure Hyper-V.**
   a. Create and configure virtual machines including integration services.
   b. Create and manage checkpoints.
   c. Create and configure virtual switches.
   d. Create and configure virtual disks.
   e. Move a virtual machine's storage.
3. **Configure mobility options.**
   a. Configure offline file policies, power policies (powercfg), Windows to Go, sync options, Sync Center, and Wi-Fi direct.
4. **Configure security for mobile devices.**
   a. Configure BitLocker; configure startup key storage

H. PLAN AND IMPLEMENT A MICROSOFT 365 SOLUTION

Effective Information Technology professionals demonstrate proficiency in planning and implementing a Microsoft 365 solution via the operating system. The following accountability criteria are considered essential for students in the Information Support and Services and Networking Services programs of study.

1. **Support mobile devices.**
   a. Support mobile device policies including security policies, remote access, and remote wipe.
   b. Support mobile access and data synchronization including Work Folders and Sync Center.

   c. Support broadband connectivity including broadband tethering and metered networks.
   d. Support Mobile Device Management by using Microsoft Intune including, Windows 10, Windows 10 Mobile, iOS, and Android.

2. **Deploy software updates by using Microsoft Intune.**
   a. Use reports and In-Console Monitoring to identify required updates.
   b. Approve or decline updates.
   c. Configure automatic approval settings.
   d. Configure deadlines for update installations.
   e. Deploy third-party updates.

3. **Manage devices with Microsoft 365 Solution.**
   a. Provision user accounts.
   b. Enroll devices.
   c. View and manage all managed devices.
   d. Configure the Microsoft Intune subscriptions.
   e. Configure the Microsoft Service Connection Point role.
   f. Manage user and computer groups.
   g. Configure monitoring and alerts.
   h. Manage policies.
   i. Manage remote computers.

4. **Configure information protection.**
   a. Manage and configure Office 365 Data Loss Prevention, Windows Information Protection and BitLocker, Azure Information Protection, Microsoft Cloud App Security, Office 365 Advanced Security Management

I. CONFIGURE NETWORKING

Effective Information Technology professionals demonstrate proficiency in configuring networks via the operating system. The following accountability criteria are considered essential for students in the Information Support and Services and Networking Services programs of study.

1. **Configure IP settings.**
   a. Configure name resolution.
   b. Connect to a network.
   c. Configure network locations.

2. **Configure networking settings.**
   a. Connect to a wireless network.
   b. Manage preferred wireless networks.
   c. Configure network adapters.

3. **Configure and maintain network security.**
   a. Configure Windows Firewall.
   b. Configure Windows Firewall with Advanced Security.
   c. Configure connection security rules (IPsec).
   d. Configure authenticated exceptions.
   e. Configure network discovery.

J. CONFIGURE STORAGE

Effective Information Technology professionals demonstrate proficiency in storage configurations via the operating system. The following accountability criteria are considered essential for students in the Information Support and Services and Networking Services programs of study.

1. **Support data storage.**
   a. Identify and resolve issues related to the following: DFS client including caching settings; storage spaces including capacity and fault tolerance; and OneDrive
2. **Support data security.**
   a. Identify and resolve issues related to the following: Permissions including share, NTFS, and Dynamic Access Control (DAC); Encrypting File System (EFS) including Data Recovery Agent; access to removable media; BitLocker and BitLocker To Go including Data Recovery Agent and Microsoft BitLocker Administration and Monitoring (MBAM).

K. MANAGE DATA ACCESS AND PROTECTION

Effective Information Technology professionals demonstrate proficiency in managing data access and protection via the operating system. The following accountability criteria are considered essential for students in the Information Support and Services and Networking Services programs of study.

1. **Configure shared resources.**
   a. Configure shared folder permissions.
   b. Configure HomeGroup settings.
   c. Configure libraries.
   d. Configure shared printers.
   e. Configure OneDrive
2. **Configure file and folder access.**
   a. Encrypt files and folders by using EFS.
   b. Configure NTFS permissions.
   c. Configure disk quotas.
   d. Configure file access auditing.
   e. Configure authentication and authorization.

L. MANAGE REMOTE ACCESS

Effective Information Technology professionals demonstrate proficiency in managing remote access via the operating system. The following accountability criteria are considered essential for students in the Information Support and Services and Networking Services programs of study.

1. **Configure remote connections.**
   a. Configure remote authentication.
   b. Configure Remote Desktop settings.

  c. Configure VPN connections and authentication.
  d. Enable VPN Reconnect.
  e. Configure broadband tethering.
  f. Configure Remote Desktop client for Windows 10 Mobile, iOS, and Android.
  g. Protect remote desktop credentials with Remote Credential Guard.
  h. Enable restricted admin mode for RDP in Windows 8.1 and Windows 2012 R2
 2. **Configure mobility options.**
  a. Configure offline file policies.
  b. Configure power policies.
  c. Configure Windows to Go.
  d. Configure sync options.
  e. Configure Wi-Fi direct.

M. MANAGE APPS

Effective Information Technology professionals demonstrate proficiency in managing apps via the operating system. The following accountability criteria are considered essential for students in the Information Support and Services and Networking Services programs of study.

 1. **Deploy and manage RemoteApp**
  a. Configure RemoteApp and Desktop Connections settings.
  b. Configure Group Policy Objects (GPOs) for signed packages.
  c. Subscribe to the Desktop Connections feeds.
  d. Export and import RemoteApp configurations.
  e. Support iOS and Android.
  f. Configure remote desktop web access for distribution.
 2. **Support desktop apps.**
  a. Support desktop app compatibility using Windows Assessment and Deployment Kit (ADK); desktop application co-existence using Hyper-V and App-V; configuration of User Experience Virtualization (UE-V).
  b. deploy desktop apps by using Microsoft Intune

N. MANAGE UPDATES AND RECOVERY

Effective Information Technology professionals demonstrate proficiency in managing updates and recovery via the operating system. The following accountability criteria are considered essential for students in the Information Support and Services and Networking Services programs of study.

 1. **Configure system recovery.**
  a. Configure a recovery drive.
  b. Configure system restore.
  c. Perform a refresh or recycle.
  d. Perform a driver rollback.
  e. Configure restore points.

2. **Configure file recovery.**
   a. Restore previous versions of files and folders.
   b. Configure File History.
   c. Recover files from OneDrive.
3. **Configure and manage updates.**
   a. Configure update settings.
   b. Configure Windows Update policies.
   c. Manage update history.
   d. Roll back updates.
   e. Update Microsoft Store apps.

A. SAFETY

Effective professionals know the academic subject matter, including safety as required for proficiency within their area. They will use this knowledge as needed in their role. The following accountability criteria are considered essential for students in any program of study.

1. Review school safety policies and procedures.
2. Review classroom safety rules and procedures.
3. Review safety procedures for using equipment in the classroom.
4. Identify major causes of work-related accidents in office environments.
5. Demonstrate safety skills in an office/work environment.

B. STUDENT ORGANIZATIONS

Effective professionals know the academic subject matter, including professional development, required for proficiency within their area. They will use this knowledge as needed in their role. The following accountability criteria are considered essential for students in any program of study.

1. Identify the purpose and goals of a Career and Technology Student Organization (CTSO).
2. Explain how CTSOs are integral parts of specific clusters, majors, and/or courses.
3. Explain the benefits and responsibilities of being a member of a CTSO
4. .List leadership opportunities that are available to students through participation in CTSO conferences, competitions, community service, philanthropy, and other activities.
5. Explain how participation in CTSOs can promote lifelong benefits in other professional and civic organizations.

C. TECHNOLOGY KNOWLEDGE

Effective professionals know the academic subject matter, including the ethical use of technology as needed in their role. The following accountability criteria are considered essential for students in any program of study.

1. Demonstrate proficiency and skills associated with the use of technologies that are common to a specific occupation.
2. Identify proper netiquette when using e-mail, social media, and other technologies for communication purposes.
3. Identify potential abuse and unethical uses of laptops, tablets, computers, and/or networks.
4. Explain the consequences of social, illegal, and unethical uses of technology (e.g., cyber bullying, piracy; illegal downloading; licensing infringement; inappropriate uses of software, hardware, and mobile devices in the work environment).
5. Discuss legal issues and the terms of use related to copyright laws, fair use laws, and ethics pertaining to downloading of images, photographs, documents, video, sounds, music, trademarks, and other elements for personal use.
6. Describe ethical and legal practices of safeguarding the confidentiality of business-related information.
7. Describe possible threats to a laptop, tablet, computer, and/or network and methods of avoiding attacks.

D. PERSONAL QUALITIES AND EMPLOYABILITY SKILLS

Effective professionals know the academic subject matter, including positive work practices and interpersonal skills, as needed in their role. The following accountability criteria are considered essential for students in any program of study.

1. Demonstrate punctuality.
2. Demonstrate self-representation.
3. Demonstrate work ethic.
4. Demonstrate respect.
5. Demonstrate time management.
6. Demonstrate integrity.
7. Demonstrate leadership.
8. Demonstrate teamwork and collaboration.
9. Demonstrate conflict resolution.
10. Demonstrate perseverance.
11. Demonstrate commitment.
12. Demonstrate a healthy view of competition.
13. Demonstrate a global perspective.
14. Demonstrate health and fitness.
15. Demonstrate self-direction.
16. Demonstrate lifelong learning.

E. PROFESSIONAL KNOWLEDGE

Effective professionals know the academic subject matter, including positive work practices and interpersonal skills, as needed in their role. The following accountability criteria are considered essential for students in any program of study.

1. Demonstrate effective speaking and listening skills.
2. Demonstrate effective reading and writing skills.
3. Demonstrate mathematical reasoning.
4. Demonstrate job-specific mathematics skills.
5. Demonstrate critical-thinking and problem-solving skills.
6. Demonstrate creativity and resourcefulness.
7. Demonstrate an understanding of business ethics.
8. Demonstrate confidentiality.
9. Demonstrate an understanding of workplace structures, organizations, systems, and climates.
10. Demonstrate diversity awareness.
11. Demonstrate job acquisition and advancement skills.
12. Demonstrate task management skills.
13. Demonstrate customer-service skills.

Course Materials and Resources

Course Academic Standards and Indicators