Cloud App Development – Learning Objectives

May 13, 2022

Pre-Requisites

College Algebra or Equivalent

SMU Math Exam

Outcomes

❑ Object-Oriented Programming
❑ Understanding Software Development.
❑ Understanding Web Applications.
❑ Understanding Desktop Applications.
❑ Understanding Databases.

Certification Opportunities

❑ Introduction to Server-Side Development
❑ Data Storage with NoSQL
❑ User Authentication
❑ Secure Communication using HTTPS
❑ Full stack web development with React
❑ Group Server Project

Pre-Requisites

❑ Design an ASP.NET Core MVC Web Application.
❑ Configure Middleware and Services in an ASP.NET Core Web Application.
❑ Develop Controllers in an ASP.NET Core Web Application.
❑ Develop Views in an ASP.NET Core Web Application.
❑ Develop Models in an ASP.NET Core Web Application.
❑ Use Entity Framework Core to add persistent data to an ASP.NET Core Web Application.
❑ Using Layouts, CSS and JavaScript in an ASP.NET Core Web Application.
❑ Implement Simple Authentication in an ASP.NET Core Web Application.

Outcomes

❑ Design an ASP.NET Core MVC Web Application.
❑ Configure Middleware and Services in an ASP.NET Core Web Application.
❑ Develop Controllers in an ASP.NET Core Web Application.
❑ Develop Views in an ASP.NET Core Web Application.
❑ Develop Models in an ASP.NET Core Web Application.
❑ Use Entity Framework Core to add persistent data to an ASP.NET Core Web Application.
❑ Using Layouts, CSS and JavaScript in an ASP.NET Core Web Application.
❑ Implement Simple Authentication in an ASP.NET Core Web Application.

CSC 160: Computing
Technologies (Python/
Introduction To
Programming)

❑ Perform Operations using Data Type and Operators
❑ Control Flow with Decisions and Loops
❑ Perform Input and Output Operations
❑ Document and Structure Code
❑ Perform Troubleshooting and Error Handling
❑ Perform Operations using Modules and Tools
❑ Modern Application Development with Python on AWS Specialization

CSC 230: Programming
In Java/Object
Oriented Programming

❑ Open-Source Software Development Methods
❑ Linux for Developers
❑ Working at the command line
❑ Filesystem layout, partitions
❑ Monitoring utilities
❑ Linux Tools for Developers
❑ Building packages out of software in Linux
❑ Using Git for Distributed Development
❑ How to make changes in a repository
❑ How to make changes in repositories available to others
❑ How to acquire changes made by other individuals
❑ How to find errors in your work and go back to earlier states of your projects
❑ How to make commits, diffs, merges, rebases

CSC TBD: Linux
Development/
Networking (From a
Developer perspective)

❑ Write Transact-SQL SELECT queries and modify data.
❑ Query multiple tables using joins.
❑ Implement functions & aggregate data.
❑ Group and pivot data using queries.
❑ Implement data types and NULLs.
❑ Query temporal data & non-relational data.
❑ Query data, subqueries, APPLY & table expressions.
❑ Create database programmability objects using T-SQL.
❑ Implement error handling and transactions.

CSC 305: SQL
and Application Development

❑ Open-Source Software Development Methods
❑ Linux for Developers
❑ Working at the command line
❑ Filesystem layout, partitions
❑ Monitoring utilities
❑ Linux Tools for Developers
❑ Building packages out of software in Linux
❑ Using Git for Distributed Development
❑ How to make changes in a repository
❑ How to make changes in repositories available to others
❑ How to acquire changes made by other individuals
❑ How to find errors in your work and go back to earlier states of your projects
❑ How to make commits, diffs, merges, rebases

CSC 457: Developing
Cloud Solutions in AWS

❑ Design an ASP.NET Core MVC Web Application.
❑ Configure Middleware and Services in an ASP.NET Core Web Application.
❑ Develop Controllers in an ASP.NET Core Web Application.
❑ Develop Views in an ASP.NET Core Web Application.
❑ Develop Models in an ASP.NET Core Web Application.
❑ Use Entity Framework Core to add persistent data to an ASP.NET Core Web Application.
❑ Using Layouts, CSS and JavaScript in an ASP.NET Core Web Application.
❑ Implement Simple Authentication in an ASP.NET Core Web Application.

Opportunities

❑ Design an ASP.NET Core MVC Web Application.
❑ Configure Middleware and Services in an ASP.NET Core Web Application.
❑ Develop Controllers in an ASP.NET Core Web Application.
❑ Develop Views in an ASP.NET Core Web Application.
❑ Develop Models in an ASP.NET Core Web Application.
❑ Use Entity Framework Core to add persistent data to an ASP.NET Core Web Application.
❑ Using Layouts, CSS and JavaScript in an ASP.NET Core Web Application.
❑ Implement Simple Authentication in an ASP.NET Core Web Application.

❑ Design an ASP.NET Core MVC Web Application.
❑ Configure Middleware and Services in an ASP.NET Core Web Application.
❑ Develop Controllers in an ASP.NET Core Web Application.
❑ Develop Views in an ASP.NET Core Web Application.
❑ Develop Models in an ASP.NET Core Web Application.
❑ Use Entity Framework Core to add persistent data to an ASP.NET Core Web Application.
❑ Using Layouts, CSS and JavaScript in an ASP.NET Core Web Application.
❑ Implement Simple Authentication in an ASP.NET Core Web Application.

❑ Design an ASP.NET Core MVC Web Application.
❑ Configure Middleware and Services in an ASP.NET Core Web Application.
❑ Develop Controllers in an ASP.NET Core Web Application.
❑ Develop Views in an ASP.NET Core Web Application.
❑ Develop Models in an ASP.NET Core Web Application.
❑ Use Entity Framework Core to add persistent data to an ASP.NET Core Web Application.
❑ Using Layouts, CSS and JavaScript in an ASP.NET Core Web Application.
# Server Cloud Administration – Learning Objectives

## Pre-Requisites
- **College Algebra or Equivalent**
- **SMU Math Exam**

## Outcomes
- Network architecture.
- Network operations.
- Network security.
- Troubleshooting.
- Industry standards, best practices & network theory.

## Certification Opportunities
- **CSC 160: Computing Technologies (Introduction to Computer Science)**
  - Describe Windows PowerShell functionality & run cmds.
  - Identify and run cmdlets for server administration.
  - Work with Windows PowerShell pipeline.
  - Describe techniques Windows PowerShell pipeline uses.
  - Use PSPs & PSDrives with other forms of storage.
  - Query system information by using WMI and CIM.
  - Work with variables, arrays, and hash tables.
  - Write basic scripts in Windows PowerShell.
  - Write advanced scripts in Windows PowerShell.
  - Administer remote computers.
  - Use background jobs and scheduled jobs.
  - Use advanced Windows PowerShell techniques.
  - Linux Bash Scripting PowerShell OSS v7

- **CSC 235: Linux Administration**
  - Provision and maintain Linux Infrastructure.
  - Gain an understanding of Linux commands and architecture.
  - Work at the command line to install, update, and configure system components.
  - Learn standards and management for user and file permissions.
  - Understand fundamentals of system security, performance, and maintenance.
  - Explore the implementation of tools for automating these practices.

- **CSC 330: Networking and Server Fundamentals**
  - Introduce the OSI Model.
  - Understanding: LAN, Wired & Wireless Networks, IP, & WAN.
  - Defining Network Infrastructure & security.
  - Install and configure DNS servers & IPAM.
  - Create and configure DNS zones & records.
  - Install, configure and manage DHCP.
  - Implement: Network VPN connectivity solution.
  - IPv4/IPv6 addressing solutions, VLSM, subnetting.
  - Develop high-performance network solutions.
  - Identify scenarios/requirements for implementing SDN.

- **CSC 331: Server Administration & Configuration (IAM/Linux Admin LDAP/Active Directory)**
  - Install/config. domain controllers, AD CS, AD FS, & AD RMS.
  - Create/manage AD users, groups, OUs, & computers.
  - Configure service authentication & account policies.
  - Maintain Active Directory.
  - Configure AD in a complex enterprise environment.
  - Create and manage GPOs.
  - Config Group Policy processing, settings & preferences.
  - Manage certificates & Implement WAP.

- **CSC 332: Configuring Linux/Windows Server Services (Server 2022)**
  - Use administrative techniques and tools in WS2022 and Linux.
  - Implement identity Services.
  - Manage network infrastructure services.
  - Configure file servers and storage.
  - Manage VMs using Hyper-V virtualization & containers.
  - Apply security features to protect critical resources.
  - Configure Remote Desktop Services.
  - Implement remote access and web services.
  - Implement service/performance monitoring & apply troubleshooting.

- **CSC 456: Configuring and Deploying Cloud Technologies**
  - Create and scale virtual machines.
  - Implement storage solutions.
  - Configure virtual networking.
  - Back up & share data using Data Services.
  - Connect to the cloud & on-premises sites.
  - AWS CDK.
  - AWS Identity and Access Management.
  - Monitor infrastructure.
  - Manage network traffic.
  - Secure identities.

---

**Pre-Requisites**
- **CSC 160: Computing Technologies (Introduction to Computer Science)**
  - College Algebra or Equivalent
  - SMU Math Exam

**Outcomes**
- Network architecture.
- Network operations.
- Network security.
- Troubleshooting.
- Industry standards, best practices & network theory.

**Certification Opportunities**
- **CSC 160: Computing Technologies (Introduction to Computer Science)**
  - Describe Windows PowerShell functionality & run cmds.
  - Identify and run cmdlets for server administration.
  - Work with Windows PowerShell pipeline.
  - Describe techniques Windows PowerShell pipeline uses.
  - Use PSPs & PSDrives with other forms of storage.
  - Query system information by using WMI and CIM.
  - Work with variables, arrays, and hash tables.
  - Write basic scripts in Windows PowerShell.
  - Write advanced scripts in Windows PowerShell.
  - Administer remote computers.
  - Use background jobs and scheduled jobs.
  - Use advanced Windows PowerShell techniques.
  - Linux Bash Scripting PowerShell OSS v7

- **CSC 235: Linux Administration**
  - Provision and maintain Linux Infrastructure.
  - Gain an understanding of Linux commands and architecture.
  - Work at the command line to install, update, and configure system components.
  - Learn standards and management for user and file permissions.
  - Understand fundamentals of system security, performance, and maintenance.
  - Explore the implementation of tools for automating these practices.

- **CSC 330: Networking and Server Fundamentals**
  - Introduce the OSI Model.
  - Understanding: LAN, Wired & Wireless Networks, IP, & WAN.
  - Defining Network Infrastructure & security.
  - Install and configure DNS servers & IPAM.
  - Create and configure DNS zones & records.
  - Install, configure and manage DHCP.
  - Implement: Network VPN connectivity solution.
  - IPv4/IPv6 addressing solutions, VLSM, subnetting.
  - Develop high-performance network solutions.
  - Identify scenarios/requirements for implementing SDN.

- **CSC 331: Server Administration & Configuration (IAM/Linux Admin LDAP/Active Directory)**
  - Install/config. domain controllers, AD CS, AD FS, & AD RMS.
  - Create/manage AD users, groups, OUs, & computers.
  - Configure service authentication & account policies.
  - Maintain Active Directory.
  - Configure AD in a complex enterprise environment.
  - Create and manage GPOs.
  - Config Group Policy processing, settings & preferences.
  - Manage certificates & Implement WAP.

- **CSC 332: Configuring Linux/Windows Server Services (Server 2022)**
  - Use administrative techniques and tools in WS2022 and Linux.
  - Implement identity Services.
  - Manage network infrastructure services.
  - Configure file servers and storage.
  - Manage VMs using Hyper-V virtualization & containers.
  - Apply security features to protect critical resources.
  - Configure Remote Desktop Services.
  - Implement remote access and web services.
  - Implement service/performance monitoring & apply troubleshooting.

- **CSC 456: Configuring and Deploying Cloud Technologies**
  - Create and scale virtual machines.
  - Implement storage solutions.
  - Configure virtual networking.
  - Back up & share data using Data Services.
  - Connect to the cloud & on-premises sites.
  - AWS CDK.
  - AWS Identity and Access Management.
  - Monitor infrastructure.
  - Manage network traffic.
  - Secure identities.
Cybersecurity Administration – Learning Objectives
May 13, 2022

Core
- Explain the concepts of computer networking, the protocols & their operation & security implications.
- Explain architectural security elements of OS’s
- Explain interaction of app programs with both the host & their use of network resources securely
- Explain the basic concepts of virtualization, virtual machines, and software defined networks
- Assess systems & applications security/performance using tools to monitor & analyze resources

Advanced
- Develop skills in Python/PHP/Bash scripting
- A computationally intensive approach to essential fundamental mathematics for computer science coding
- Learn scripting usage with Sage and Python
- Key topics: For-loops, tuples, dictionaries, lists, methods, sets, classes
- Concepts of data structures and algorithms
- Develops basic programming logic

Pre-Requisites
- College Algebra or Equivalent
- CompTIA A+/Net+ or similar cert
- 1-3 years of IT Experience or Prior completion of WaV2T/MISSA Program

Outcomes
- Understand physical security principles, Internet & wireless security
- Understand user authentication, permissions, password & audit policies, encryption & malware
- Understand dedicated firewalls, network isolation & protocol security
- Understand server, web & cloud protection

Certification Opportunities
- CSC 345: Advanced Networking
  - Net Security
- CSC 495: Linux Fundamentals/Ethical Hacking
  - CompTIA Linux+
- CSC 162: OS, App, Web Security
  - CompTIA Sec+
- CSC 160: Computing Technologies
  - Python/PHP
- CSC 364: Cybersecurity Threat Intelligence
  - CompTIA CySA+
- CSC 395: Managing Identity & IAM
  - AWS Solutions Architect
- CSC 160: Computing Technologies
  - Python/PHP

- Relate organizational risk management to vulnerability assessment and risk mitigation.
- Apply the concepts of threat modeling & threat surfaces to IT systems, public, private and hybrid cloud environments
- Conduct vulnerability assessments using CVE: Common Vulnerabilities and Exposure data, in conjunction with situation-specific threat modeling
- Develop and implement risk mitigation solutions to contain, eliminate or otherwise mitigate risks found in IT systems

- Explain the concepts of Identity Management, the Control Plane, Access Control to cloud/server architectures
- Compare and contrast various models for identity management and access control (LDAP/AD)
- AAA: Authentication, Authorization, Accounting
- Networking security, security groups, IaaS workload security
- Cloud security/cloud service models/backup & log analytics
- Cloud gateways, Web App security, Firewalls & dealing with DDoS threats
- Cloud Disk & Storage Encryption
- Identify key legal/ethical/regulatory elements that bear on identity management, AC, & accountability