Course Description
CIS3651C | Cloud System Administration and Operations | 4.00 credits

This course offers a comprehensive exploration into the world of cloud system administration using cloud computing as the cornerstone of study. This intensive course seeks to equip students with hands-on knowledge and skill development in cloud infrastructure, tooling, computing, networking, storage, security, and deployment. From the fundamentals of Systems Operations on the cloud to intricate deployment strategies using CloudFormation, students will navigate various cloud services, ensuring a solid foundation in cloud administration. With a balance of theory, lab work, and activities, students will prepare to address real-world challenges helpful in the transition to cloud-based roles. Prerequisites: COP1047C and CTS1145.

Course Competencies
Competency 1: The student will demonstrate a foundational understanding of cloud-based systems operations by:
1. Summarizing the core components and principles of cloud systems operations
2. Explaining the significance of identity and access management (IAM) in securing cloud resources
3. Utilizing command-line interfaces (CLIs) for cloud resource management
4. Analyzing IAM policies and access controls using policy simulation tools

Competency 2: The student will develop proficiency in utilizing tools and automation strategies to enhance the efficiency of cloud-based operations by:
1. Describing the purpose and capabilities of cloud management tools
2. Evaluating available administration tools for effective cloud operations
3. Executing tasks using cloud management tools to enhance operational efficiency
4. Creating and managing cloud resources using automation techniques

Competency 3: The student will gain competence in effectively managing computing instances and implementing scalability measures by:
1. Understanding the role of virtual computing instances in cloud environments
2. Implementing security measures for computing instances using platform-specific controls
3. Utilizing scalability mechanisms to adjust computing resources based on demand
4. Troubleshooting issues related to provisioning and managing virtual instances

Competency 4: The student will acquire knowledge and skills in working with containerized applications and serverless computing models by:
1. Differentiating between containerization and serverless computing approaches
2. Developing serverless functions and APIs using cloud-native services
3. Managing containers and serverless functions using platform-specific tools
4. Implementing tasks involving containerized applications and serverless functions

Competency 5: The student will master the management of databases, networking components, and establishing connectivity by:
1. Analyzing cloud-specific database services and their capabilities
2. Configuring network components to create isolated environments in the cloud
3. Migrating and managing databases using platform-specific tools and services
4. Troubleshooting network connectivity issues within the cloud environment

Competency 6: The student will demonstrate proficiency in managing cloud storage solutions and monitoring infrastructure resources by:
1. Exploring cloud storage services available on different platforms

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2. Utilizing cloud storage solutions for various storage needs and archiving purposes
3. Monitoring cloud resources' performance using platform-specific monitoring tools
4. Auditing and monitoring cloud activities using tools provided by the cloud platform

Competency 7: The student will acquire skills in optimizing resource consumption and automating deployments by:
1. Implementing strategies to optimize resource consumption and cost management
2. Utilizing platform-specific templates for infrastructure configuration
3. Automating resource provisioning and deployment using platform-specific tools
4. Enhancing operational efficiency through automated deployment practices