![Miami Dade College]

Course Description

CIS2992C | Cloud DevOps | 4.00 credits

This course focuses on the DevOps role in cloud. A student will learn the concepts and skills needed to perform a DevOps engineer role. Students will gain expertise in provisioning, operating, and managing distributed application systems in the cloud. The student will evaluate and perform the following tasks in cloud-based systems: implement and manage continuous delivery systems and methodologies, implement and automate security controls, governance processes, and compliance validation, define and deploy monitoring, metrics, and logging systems, implement systems that are highly available, scalable, and self-healing, design, manage, and maintain tools to automate operational processes. Prerequisites: COP1047C and CTS2375C.

Competency 1: The student shall understand the cloud software development life cycle (SDLC) automation by:
1. Applying concepts required to automate a continuous integration/ continuous development (CI/CD) pipeline.
2. Determining source control strategies and how to implement them in appropriate cloud tools
3. Applying the concepts required to automate and integrate testing.
4. Applying the concepts required to build and manage programming project artifacts securely
5. Determining deployment/ delivery strategies (e.g., A/B, Blue/green, Canary, Red/black) and how to implement them using cloud services

Competency 2: The student will implement configuration management and infrastructure as code by:
1. Determining appropriate deployment services based on deployment needs
2. Determining application and infrastructure deployment models based on business needs
3. Applying security concepts in the automation of resource provisioning
4. Determining how to implement lifecycle hooks on an application deployment
5. Applying concepts required to manage systems using appropriate configuration management tools and services

Competency 3: The student will demonstrate how to apply cloud monitoring and logging infrastructure and tools by:
1. Determining how to set up the aggregation, storage, and analysis of logs and metrics
2. Applying concepts required to automate monitoring and event management of an environment
3. Applying concepts required to audit, log, and monitor operating systems, infrastructures, and applications
4. Determining how to implement tagging and other metadata strategies\

Competency 4: The student will implement cloud policies and standards automation by:
1. Applying concepts required to enforce standards for logging, metrics, monitoring, testing, and security for cloud deployments
2. Determining how to optimize system cloud costs through automation
3. Applying concepts required to implement governance strategies across systems

Competency 5: The student will perform cloud incident and event response activities by:
1. Troubleshooting issues and determining how to restore operations effectively
2. Determining how to automate event management and alerting for system issues
3. Applying concepts required to implement automated healing as appropriate
4. Applying concepts required to set up event-driven automated actions

Competency 6: The student will implement High Availability, Fault Tolerance, and Disaster Recovery by:
1. Determining appropriate use of multi- AZ versus multi-Region architectures
2. Determining how to implement high availability, scalability, and fault tolerance
3. Determining the right services based on business needs (e.g., RTO/RPO, cost)
4. Determining how to design and automate disaster recovery strategies
5. Evaluating a deployment for potential points of failure. f) Implementing a solution using all the techniques

Learning Outcomes:
- Use quantitative analytical skills to evaluate and process numerical data
- Solve problems using critical and creative thinking and scientific reasoning
- Formulate strategies to locate, evaluate, and apply information
- Use computer and emerging technologies effectively