Miami Dade College

**Course Description**

**COP4723 | Database Administration | 4.00 credits**

This upper division course, for students majoring in Information Systems Technology, builds a deeper understanding of how databases work, including topics in database theory and architecture, data modeling, query languages, and security. Students will learn the fundamentals of SQL, including how to create and maintain database objects, and how to store, retrieve, and manipulate data, and the basics of managing the database environment. Prerequisite: CGS1540.

**Course Competencies:**

**Competency 1:** The student will analyze and evaluate database architecture, hardware, software, network, and distributed databases by:

1. Assessing the logical and physical architecture of the database, the server and the client components, and database memory architecture.
2. Examining the differences between client and server installation.
3. Installing an instance of the database on a host machine.
4. Establishing a connection and creating a session to the database instance.
5. Examining the physical structure, memory structure, and process structure of the database.

**Competency 2:** The student will be interpreting security, audit, users, permissions, administration rules, and required guidelines to install database by:

1. Examining the steps needed to create a database.
2. Examining the database administrative tools.
3. Configuring the initial settings for creating the database.
4. Creating, starting, and stopping a database instance.
5. Examining the basic steps in managing the configuration parameter files.

**Competency 3:** The student will query a database by:

1. Writing basic SQL single row, datatype conversion, group, and user-defined functions.
2. Writing filtered, sorted, and aggregated queries.
3. Writing SQL statements using advanced queries involving joins, subqueries, and other specialized queries.

**Competency 4:** The student will be creating a database and its users, and assign privileges with effective management of memory and resource by:

1. Discussing user table rights and restrictions.
2. Creating roles and user accounts.
3. Granting privileges to roles and users.
4. Assigning a role to a user.
5. Viewing privilege information.
6. Revoking privileges from a user and a role.
7. Removing a user and roles.

**Competency 5:** The student will be monitoring the database performance and isolate problem areas by:

1. Listing the steps in the tuning phases.
2. Analyzing tuning goals and service level agreements.
3. Assessing common performance problems.
4. Analyzing the tuning methodology.

**Competency 6:** The student will be performing a database rollback by:

1. Appraising the different types of failures that occur in the database.
2. Performing a complete recovery on a database.
3. Performing an incomplete recovery on a database.
4. Performing a recovery of non-critical files.

**Competency 7:** The student will be employing backup and recovery, database space management, partitioning, and diagnostic tools by:

1. Examining the purpose of the Flash Recovery area.
2. Analyzing the various types of backups.
3. Performing block-level backups.
4. Implementing the commands for performing backups at various levels.
5. Setting Duration and Throttling.
6. Analyzing the Block Tracking feature.
7. Using RMAN (Recovery Manager) commands to display information about backups.
8. Tuning redo writing and archiving operations.
9. Setting and modifying thresholds for space usage.
10. Managing tablespace usage to reduce space-related error conditions.
11. Using different storage options to improve the performance of queries.

**Learning Outcomes:**

1. Computer / Technology Usage
2. Critical Thinking