### Course Outline

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>IST 263</td>
<td>Database Administration I</td>
<td>4</td>
</tr>
</tbody>
</table>

**Hours:**
- Lecture/Lab/Other: 3/2/0

**Co- or Pre-requisite:**
- IST 262

**Implementation:**
- Semester & Year: Fall 2022

**Catalog description:**
Addresses Oracle Database software installation along with new database creation and administration. Students configure the database to support an application, create users, define storage structures, set up security, design a backup and recovery strategy, and monitor the database to ensure its smooth operation.

**General Education Category:**
- Not GenEd

**Course coordinator:**
- Queen E. Okike, Ed.D.
- Associate Professor.
- (609) 570-3464 or Ext. 3464.
- okikeq@mccc.edu

**Required texts & Other materials:**
Database Administration 1 Packages from Oracle Corporation.

**Course Student Learning Outcomes (SLO):**

1. Explain the Oracle Database Architecture and demonstrate normalization in an Oracle relational database. [Support ILG# 1, 4, 10, 11; PO #1]
2. Prepare the Database Environment and manipulate .data [Support ILG# 1, 2, 4, 10, 11; PO#2, 3]
3. Create an Oracle Database and manage the Oracle Instance. [Support ILG# 2, 4, 10, 11; PO# 2, 3]
4. Configure the Oracle Network Environment and manage database storage structures. [Support ILG# 4, 10, 11; PO# 2, 3]
5. Manage Schema Objects, data and concurrency and manage undo data [Support ILG# 4, 10, 11; PO# 2, 3]
6. Implement Oracle database security and carry out database maintenance and performance Management Intelligent Infrastructure Enhancements. [Support ILG# 4, 10, 11; PO# 2, 3]
7. Describe backup and recovery Concepts [Support ILG# 4, 10, 11; PO#1]
8. Perform database backups, database recovery, and move Data [Support ILG#4, 10, 11; PO# 2, 3].

**Course-specific Institutional Learning Goals (ILG):**

- **Institutional Learning Goal 1. Written and Oral Communication in English.** Students will communicate effectively in both speech and writing.
- **Institutional Learning Goal 2. Mathematics.** Students will use appropriate mathematical and statistical concepts and operations to interpret data and to solve problems.
- **Institutional Learning Goal 4. Technology.** Students will use computer systems or other appropriate forms of technology to achieve educational and personal goals.
- **Institutional Learning Goal 10. Information Literacy:** Students will recognize when information is needed and have the knowledge and skills to locate, evaluate, and effectively use information for college level work.
- **Institutional Learning Goal 11. Critical Thinking:** Students will use critical thinking skills understand, analyze, or apply information or solve problems.
Program Learning Outcomes for Information Technology Database Certificate (PLO)
1. Explain basic concepts of databases.
3. Deploy databases on cloud platform.

Units of study in detail – Unit Student Learning Outcomes:
Course Content Details.

Unit I Explore the Oracle Database Architecture and Environment. [Support Course SLOs #1, 2]
Learning Objectives
The student will be able to:
- Explain the Memory Structures.
- Describe the Process Structures.
- Describe Overview of Storage Structures.
- Prepare the Database Environment.
- Plan an Oracle Database installation.
- Install the Oracle software by using Oracle Universal Installer (OUI)

Unit II Create an Oracle Database and manage the Oracle Instance. [Support Course SLOs #3]
Learning Objectives
The student will be able to:
- Create a database by using the Database Configuration Assistant (DBCA); creating an Oracle Database.
- Manage the Oracle Instance.
- Set database initialization parameters.
- Describe the stages of database startup and shutdown.
- Use alert log and trace files.
- Use data dictionary and dynamic performance views.

Unit 3 Configure the Oracle Network Environment and Manage Database Storage Structures. [Support Course SLOs #4]
Learning Objectives
The student will be able to:
- Configure and Manage the Oracle Network.
- Using the Oracle Shared Server architecture.
- Manage Database Storage Structures
- Overview of tablespace and datafiles views.
- Create and manage tablespaces.

Unit IV Administer Oracle Database Security. [Support Course SLOs #6]
Learning Objectives
The student will be able to:
- Create and manage database user accounts.
- Grant and revoke privileges.
- Create and manage roles.
- Create and manage profiles.

Unit V Manage Schema Objects, Data and Concurrency. [Support Course SLOs #5]
Learning Objectives
The student will be able to
- Create and Modify tables.
- Manage Constraints.
- Create indexes.
• Create and use temporary tables.
• Manage Data and Concurrency.
• Manage data using DML.
• Identify and administer PL/SQL objects.
• Monitor and resolve locking conflicts.

Unit VI Manage Undo Data. [Support Course SLOs #5]
Learning Objectives
The student will be able to
• Explain overview of undo data.
• Manage undo data.
• Implement Oracle Database Security.
• Describe Database Security and Principle of Least Privilege
• Work with Standard Database Auditing
• Explain Database Maintenance.
• Use and manage optimizer statistics.
• Use and manage Automatic Workload Repository (AWR).
• Use advisory framework.
• Manage Alerts and Thresholds.

Unit VII Maintain Database and Perform Management Intelligent Infrastructure Enhancements. [Support Course SLOs #6]
Learning Objectives
The student will be able to
• Use Automatic Memory Management.
• Use Memory Advisors.
• Troubleshoot invalid and unusable objects.
• Describe Intelligent Infrastructure Enhancements.
• Use the Enterprise Manager Support Workbench.
• Manage Patches.

Unit VIII Backup and Recovery Concepts. [Support Course SLOs #7]
Learning Objectives
The student will be able to
• Identify the types of failure that can occur in an Oracle database.
• Describe ways to tune instance recovery.
• Identify the importance of checkpoints, redo log files, and archived log files
• Describe Overview of flash recovery area.
• Configure ARCHIVELOG mode.
• Performing Database Backups.
• Create consistent database backups.
• Back up your database without shutting it down.
• Create incremental backups.
• Automate database backups.
• Manage backups, view backup reports and monitor the flash recovery area.

Unit IX Perform Backup, Recovery and Data Movement. [Support Course SLOs #8]
Learning Objectives
The student will be able to
• Overview of Data Recovery Advisor.
• Use Data Recovery Advisor to Perform recovery. (Control file, Redo log file and Data file).
• Describe and use methods to move data (Directory objects, SQL*Loader, External Tables).
• Use Data Pump Export and Import to move data between Oracle databases.
**Evaluation of Student Learning**

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Average of weekly homework assignments Four Units of Tests:</td>
<td>50%</td>
</tr>
<tr>
<td>Unit 1 &amp; 3</td>
<td>10%</td>
</tr>
<tr>
<td>Unit 4 &amp; 5</td>
<td>10%</td>
</tr>
<tr>
<td>Unit 6 &amp; 7</td>
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</tr>
<tr>
<td>Unit 8 &amp; 9</td>
<td>10%</td>
</tr>
<tr>
<td>Midterm evaluation examination</td>
<td>10%</td>
</tr>
<tr>
<td>Final evaluation examination</td>
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</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100%</strong></td>
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