



**MERCER**  
COUNTY COMMUNITY COLLEGE

# COURSE OUTLINE

Course Number	Course Title	Credits
IST 263	Database Administration I	4
Hours:	Co- or Pre-requisite	Implementation
Lecture/Lab/Other 3/2/0	IST 262	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:**

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Associate Professor.  
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**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.
2. Code using Oracle Structured Query (SQL) Language.
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**

Average of weekly homework assignments	Four Units of Tests:	50%
Unit 1 & 3		
Unit 4 & 5		10%
Unit 6 & 7		10%
Unit 8 & 9		10%
Midterm evaluation examination		10%
Final evaluation examination		10%
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<b>Total</b>		<b>100%</b>
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