# DBA 110 Database Concepts

## COURSE DESCRIPTION:

Prerequisites: None
Corequisites: None

This course introduces database design and creation using a DBMS product. Emphasis is placed on data dictionaries, normalization, data integrity, data modeling, and creation of simple tables, queries, reports, and forms. Upon completion, students should be able to design and implement normalized database structures by creating simple database tables, queries, reports, and forms.
Course Hours Per Week: Class, 2. Lab, 3. Semester Hours Credit, 3.

## LEARNING OUTCOMES:

Upon completing requirements for this course, the student will be able to:

1. Identify Relationships in a database.
2. Design normalized database structures.
3. Query a database.

## OUTLINE OF INSTRUCTION:

I. Introduction
   - A. Introduction to the Oracle Academy
   - B. Data vs. Information
   - C. History of the Database
   - D. Major Transformations in Computing

II. Entities and Attributes
   - A. Conceptual and Physical Models
   - B. Entities, Instances, Attributes, and Identifiers
   - C. Entity Relationship Modeling and ERDs

III. Relationship Basics
   - A. Identifying Relationships
   - B. ER Diagramming Conventions
   - C. Speaking ERDish and Drawing Relationships
   - D. Matrix Diagrams

IV. Super/Sub Types and Business Rules
   - A. Supertypes and Subtypes
   - B. Documenting Business Rules

V. Relationship Fundamentals
   - A. Relationship Transferability
   - B. Relationship Types
   - C. Resolving Many-to-Many Relationships

D. Understanding CRUD Requirements

VI. UIDs and Normalization
- A. Artificial, Composite, and Secondary UIDs
- B. Normalization and First Normal Form
- C. Second Normal Form
- D. Third Normal Form

VII. Arcs, Hierarchies, and Recursive Modeling
- A. Arcs
- B. Hierarchies and Recursive Relationships

VIII. Changes and Historical Modeling
- A. Modeling Change: Time
- B. Modeling Change: Price
- C. Drawing Conventions for Readability

IX. Mapping
- A. Introduction to Relational Database Concepts
- B. Basic Mapping: The Transformation Process
- C. Relationship Mapping
- D. Subtype Mapping

X. Introduction to Oracle Application Express
- A. Oracle Application Express
- B. Relational Database Technology
- C. Anatomy of a SQL Statement

XI. SELECT and WHERE
- A. Columns, Characters, and Rows
- B. Limit Rows Selected
- C. Comparison Operators

XII. WHERE, ORDER BY, and Intro to Functions
- A. Logical Comparisons and Precedence Rules
- B. Sorting Rows
- C. Introduction to Functions

XIII. Single Row Functions Part I
- A. Case and Character Manipulation
- B. Number Functions
- C. Date Functions

XIV. Single Row Functions Part II
- A. Conversion Functions

B. NULL Functions
C. Conditional Expressions

**REQUIRED TEXTBOOK AND MATERIAL:**

Oracle Academy and Oracle Application Express (APEX) – FREE resources