

**ITMD 422 SYLLABUS****ITMD 422 Advanced Topics in Data Management**

**Hours:** 3 credit hours / 45 contact hours

**Instructor:** Luke Papademas

**Textbook, title, author, and year:** *Database Systems: Design, Implementation & Management*, Carlos Coronel, Steven Morris, 2019

**Specific course information**

- a. **Catalog description:** Advanced topics in database management and programming including client server application development are introduced. Students will learn the use of Structured Query Language in a variety of application and operating system environments. Expands knowledge of data modeling concepts and introduces object - oriented data modeling techniques with specific attention to the use of database management systems in response to defined business problems.
- b. **Prerequisites:** ITMD 321.

**Specific goals for the course**

- a. **Course Outcomes:** Upon completion of this course, students will be able to use a Data Base Management System (DBMS) to create and manage files of data on a microcomputer system. The data structures for specific business applications will be created; enter, manipulate, and organize the data; issue data queries; use a report generator; restructure files; use the screen for input and output; and establish relationships between multiple files. The student will become aware of the need for back-up procedures as an integral part of data integrity.
- b. **Course Student Outcomes:**
  - Explain and use Data Modeling
  - Describe and use ERDs and DFDs
  - Recall SQL basics including
    - Datatypes
    - Character Functions
    - Date Functions
    - Aggregate Functions
    - Joins
    - Subqueries
    - Set Operators
  - Describe and employ database objects
  - Explain and use DML
  - Explain and use a Data Dictionary
  - Outline and describe essential elements of database security
  - Demonstrate PL / SQL Programming Basics
  - Describe and employ error handling, cursors, and triggers

**Topics to be covered:**

- a. RDBMS Systems and Concepts; Database Terminology; The Language of Database Systems; Database Set Theory; MS Access; OLAP (Online Analytical Processing)
- b. Data Modeling ; ERDs, UML; Business Requirements / Business Rules
- c. The Relational Database Model; A Review of SQL; SQL Statements
- d. Using Database Tools; Entity Relationship (ER) Modeling
- e. More on SQL / Data Analytics and Data Management; Advanced Data Modeling
- f. Topics in PL / SQL; Topics in Database Table Normalization
- g. More Topics in PL / SQL
- h. Topics in Data Analytics; Decision Making; Forecasting; Advanced SQL Concepts
- i. Object - Oriented Database Practices; Database Design
- j. Topics; Web Applications of Database Systems (ASP and the Web / PHP and the Web); Transaction Management
- k. Intelligent - Based Database Systems (Search Engines / Cortana); Database Performance Tuning / Optimization
- l. Big Data; Data Mining; Data Science; Distributed Database Management Systems
- m. Queuing Theory for Oracle Professionals; Business Intelligence and Data Warehouses
- n. Eliminating Data Redundancy; Big Data Analytics and NoSQL
- o. General Course Review; Database Connectivity; Database Administration and Security