Course Syllabus Part I
CSD 310 Database Development and Use

3 Credit Hours

Course Description

This course introduces the concepts of relational and non-relational database structures from a software developer perspective. Topics include defining key/value pairs, building table structures, manipulating records, using data types, and implementing access controls. The Structured Query Language (SQL) will be used to manipulate the models. Students will prepare a small application using a relational database management system.

Course Prerequisites

CSD 205 Introduction to Programming with Python

Course Skills

- Leverage creative thinking and innovative approaches to solve problems and overcome challenges in a development team.
- Research stakeholder requirements, including documentation and coordination of specifications.
- Apply information security techniques to protect the data being used in software applications.
- Use the Python programming language to develop data-driven software applications.
- Develop efficient SQL queries to improve the performance of software applications.

Course Objectives

Students who successfully complete this course should be able to

- Compare and contrast the differences between relational and non-relational database structures.
- Design data models to accurately reflect business requirements.
- Defend the use of non-relational database structures.
- Use the Python programming language to connect and interface with relational and non-relational database systems.
- Create, update, delete, and query records in relational and non-relational database systems.

- Apply industry best practices for managing access controls and data validation.
- Identify methods to mitigate security risks.

Grading Scale

93 – 100% = A	87 – 89% = B+	77 – 79% = C+	67 – 69% = D+
90 – 92% = A-	83 – 86% = B	73 – 76% = C	63 – 66% = D
	80 – 82% = B-	70 – 72% = C-	60 – 62% = D-
			0 – 59% = F

Topic Outline

I. Core Principles
   a. Business Rules
   b. Data Modeling
   c. Relational vs. Non-Relational Databases
   d. Normalization
   e. Denormalization

II. Non-Relational Databases
   a. JSON
   b. Collections
   c. Creating, Updating, and Deleting Documents
   d. Collection Queries
   e. Indexes, Validation, and Access Control

III. Relational Databases
   a. SQL
   b. Tables
   c. Creating, Updating, and Deleting Records
   d. Table Queries
   e. Advanced Queries
   f. Validation and Access Controls