GROSSMONT COLLEGE

 OFFICIAL COURSE OUTLINE

Curriculum Committee Approval: 04/20/2021

GCCCD Governing Board Approval: 05/18/2021

COMPUTER SCIENCE INFORMATION SYSTEMS 276 – INTRODUCTION TO SQL

 1. Course Number Course Title Semester Units

 CSIS 276 Introduction to SQL 3

 Semester Hours

 3 hours lecture 48-54 total hours 96-108 outside-of-class hours 144-162 total hours

 2. Course Prerequisites

 None

 Corequisite

 None

 Recommended Preparation

A “C” grade or higher or “Pass” in CSIS 110.

 3. Catalog Description

This is an introductory course in SQL (Structured Query Language**)** programming intended for persons with basic computer literacy skills. The course is designed to teach students the fundamentals of good relational database design and how to use and maintain a database using the industry-standard data query and manipulation language SQL. Students will use SQL to create tables, keys and indexes, handle security in the database and perform simple and complex queries.

 4. Course Objectives

 The student will:

 a. Discuss and describe the history of SQL and its use with relational databases.

 b. Design and build a relational database structure.

 c. Demonstrate the understanding of tables and data relationships.

 d. Analyze the processes involved in the normalization and optimization of databases.

 e. Identify Structured Query Language (SQL) statements and queries to create and populate a relational database, sort and group the data in a database, perform complex joins and extract subqueries of the data.

 f. Discuss and describe database management including security, performance and integrity.

 5. Instructional Facilities

 Standard Classroom

 6. Special Materials Required of Student

 Removable storage media compatible with lab computers.

7. Course Content

 a. History of SQL and its use with relational databases.

 b. Characteristics of good relational database design.

 1) Comparison and contrasting views of One-to-One, One-to-Many, Many-to-One and Many-to- Many relationships.

 2) Define the concept of normalization in relation to the optimization of databases.

 c. Create relational database using indexes.

 d. Alter the database structure and maintain data integrity.

 e. SELECT statement in the creation of simple and complex queries.

 f. SQL statements to sort data to be extracted from the database.

 g. Perform simple aggregate functions such as COUNTing the data.

 h. Various ways of grouping data in a query including the understanding of the NULL value and how to work with it.

 i. Process the joining of tables in order to select data from multiple tables into one subset.

 j. Concepts of subqueries.

 1) Describe the advantages and disadvantages of subqueries and joins.

 2) Differences between the use of a subquery or a join.

 3) The concept of subqueries returning a single and multiple values.

 4) The optimization of queries for faster execution.

 k. “View” commands.

 1) Explanation of the working of “views.”
2) Contrast views with other methods of obtaining data.

 3) Modification of data using views.

 l. User and group security requirements.

 1) The creation of SQL statements to add security to a database table.

 2) Meaning and use of transactions.

 3) Entity and referential integrity and when to apply them.

 8. Method of Instruction

 a. Lecture.

 b. Hands-on demonstrations and computer exercises.

 c. Discussion of team and individual projects.

 d. Projects and scenario-based lab activities: To include multiple hands-on SQL activities applied from the textbook and other sources, such as chapter-by-chapter projects.

 9. Methods of Evaluating Student Performance

 a. Written tests and quizzes.

b. Objective examinations and quizzes including a final examination

 c. Projects: To include multiple hands-on SQL development activities applied from the textbook, such as chapter-by-chapter projects utilizing SQL to build databases, run queries and reports.

 d. Hands-on labs, both as homework assignments as well as in-class tasks: an example would include the writing of a program to solve a problem with a scientific or business situation, using the SQL language.

10. Outside Class Assignments

 a. Textbook reading assignments.

 b. Team and individual projects**,** an example would include the writing of a program to solve a problem within a scientific or business situation or an interactive game utilizing SQL.

 c. Create and maintain a sample database.

 d. Respond to other students’ analysis and comments on the class discussion board.

 e. Read and analyze instructor assigned case studies; post analysis and comments to the class discussion board.

 f. Complete and pass section quizzes and course final exam.

11. Representative Texts

 a. Representative Text(s):

 Shellmon, Mark, *A Guide to SQL, 10th Edition*. Boston, MA. Cengage Publishing, 2020. ISBN – 9780357397657

 b. Supplementary texts and workbooks:

 None

 Addendum: Student Learning Outcomes

 Upon completion of this course, our students will be able to do the following:

* 1. Use Structured Query Language to create, populate, and maintain a normalized and optimized database using a professional level relational database.
	2. Use SQL to manipulate data in a relational database by sorting and grouping the data and extract and/or view the data using complex queries involving joins, subqueries and views.