Saint Leo University

COM 330
Database Concepts and Programming

Course Description:
This course introduces the student to the use of a database management system to provide the software and database necessary to upgrade a DBMS system. Database structures, applications, network, relational and hierarchical data models, applicate programs development, query systems, file security, and the role of the database administrator will be studied. A course fee may apply.

Prerequisite:
COM 204

Textbooks*:*
The textbook information which appears on our Saint Leo Bookstore ordering site is as follows:
Saint Leo University. Data Concepts(Custom). ISBN: 9780134639864

Your custom textbook was created from the following National text(s):
Data Concepts: Kroenke, D. M., Auer, D. J., Vandenberg, S. L., & Yoder, R. C. (2017). Database concepts (8th ed.). NY, NY: Pearson. ISBN: 9780134601533

Learning Outcomes:
The student will:

1. Describe and evaluate database management systems, applications of data structures, application program development, query systems, file security, and the role of database administrators.
2. Describe the Relational concepts and the use of primary and foreign keys.
3. Use structured query language to create database queries.
4. Describe the Entity Relationship Model and how it is used in database design.
5. Create databases using normalization.
6. **VALUES OUTCOME**: In this class we will study how to organize data and effectively communicate information. Hence we will learn how to take precautions while recording data and presenting it in a manner that prevents misunderstanding, while practicing the Saint Leo core value of integrity.

Core Value:
Integrity: The commitment of Saint Leo University to excellence demands that its members live its mission and deliver on its promise. The faculty, staff, and students pledge to be honest, just, and consistent in word and deed.

Evaluation:

Assessments	**Total Percentage**
Exams (4)	35%

Assignments (8) which include projects	40%
Discussions: Modules 3, 4, 5, 7, and 8	10%
Do First Discussions: Modules 1, 2, and 6	15%
Total	**100%**

Grading Scale:

Grade Score (%)

A	94-100
A-	90-93
B+	87-89
B	84-86
B-	80-83
C+	77-79
C	74-76
C-	70-73
D+	67-69
D	60-66
F	0-59

Description of Assignments:

EXAMS
There are four exams in Modules 2, 4, 6, and 8. The Exams will consist of multiple-choice and true/false questions. Students will have 35 minutes to complete 25 questions for each exam.

ASSIGNMENTS
There are eight assignments in this course (one in each module). The assignments consist of:

- Activities which involve the creation and manipulation of databases. Students will create a given database for a set of conditions, and use different SQL queries to generate forms and reports.
- Questions and problems from the textbook will be assigned to reinforce the concepts taught and to allow the students to practice designing databases, diagnosing design flaws, and also creating diagrams and documents.
- In Assignment 8, each student must incorporate the Saint Leo core value of integrity in their response.

DISCUSSION
There are 8 discussion questions in this course. Discussion topics will include topics that explore preserving confidential and privileged information, and also the effective communication of data to prevent erroneous or misleading interpretation, practicing Saint Leo University's core value of Integrity. In Modules 1, 2, and 6, the discussion question is titled "Do First Discussion." These questions require critical thinking and

problem-based learning questions and reflection and are located at the beginning of each module.

Course Schedule:

Module 1 **Why Use Databases**

Objectives When you complete this module, you should be able to:

- Describe the components of a database system.
- Describe the elements of a database.
- Describe the purpose of a database management system (DBMS).
- Explain the problems with lists, reasons for using a relational database, Structured Query Language (SQL), and Enterprise database systems.

Assignments

Items to be Completed:	**Due No Later Than:**
Post an introduction to the class	Thursday 11:59 PM EST/EDT
Read the assigned material	
Post an initial response to the Do First discussion question	Thursday 11:59 PM EST/EDT
Post responses to at least two classmates	Sunday 11:59 PM EST/EDT
Submit Assignment 1	Sunday 11:59 PM EST/EDT

Module 2 **The Relational Model**

Objectives When you complete this module, you should be able to:

- Describe the relational model.
- Describe the importance of keys and foreign keys.
- Describe how foreign keys represent relationships.
- Describe functional dependencies.

Assignments

Items to be Completed:	**Due No Later Than:**
Read the assigned material	
Post an initial response to the Do First discussion question	Thursday 11:59 PM EST/EDT
Post responses to at least two classmates	Sunday 11:59 PM EST/EDT
Submit Assignment 2	Sunday 11:59 PM EST/EDT
Complete Exam 1	Sunday 11:59 PM EST/EDT

Module 3 **Structured Query Language**

Objectives

When you complete this module, you should be able to:

- Describe the SQL statements for creating database structure.
- Describe SQL SELECT statements and options for processing a single table.
- Describe SQL SELECT statements for processing multiple tables with subqueries.
- Describe SQL statements for modifying and deleting database tables and constraints.

Assignments

Items to be Completed:	Due No Later Than:
Read the assigned material	
Post an initial response to the discussion question	Thursday 11:59 PM EST/EDT
Post responses to at least two classmates	Sunday 11:59 PM EST/EDT
Submit Assignment 3	Sunday 11:59 PM EST/EDT

Module 4 **Data Modeling and the E-R Model**

Objectives

When you complete this module, you should be able to:

- Describe the stages of database development.
- Describe the purpose and role of a data model.
- Describe how to interpret traditional E-R diagrams.
- Describe how to represent 1:1, 1:N, N:M, and binary relationships.

Assignments

Items to be Completed:	Due No Later Than:
Read the assigned material	
Post an initial response to the discussion question	Thursday 11:59 PM EST/EDT
Post responses to at least two classmates	Sunday 11:59 PM EST/EDT
Submit Assignment 4	Sunday 11:59 PM EST/EDT
Complete Exam 2	Sunday 11:59 PM EST/EDT

Module 5 **Database Design**

Objectives

When you complete this module, you should be able to:

- Describe how to transform E-R data models into relational designs.
- Describe the normalization process.
- Describe how to represent 1:1, 1:N, and N:M recursive relationships.
- Describe SQL statements for creating joins over binary and recursive relationships.

Assignments

Items to be Completed:	**Due No Later Than:**
Read the assigned material	
Post an initial response to the discussion question	Thursday 11:59 PM EST/EDT
Post responses to at least two classmates	Sunday 11:59 PM EST/EDT
Submit Assignment 5	Sunday 11:59 PM EST/EDT

Module 6 **Database Administration**

Objectives

When you complete this module, you should be able to:

- Describe importance of database administration.
- Compare the differences between database administration and data administration.
- Describe concurrency control, security, and backup and recovery, and why it is important and sometimes seems obscure.
- Describe why locking is important.
- Describe the difference between optimistic and pessimistic locking and the importance of backup and recovery for a database system.

Assignments
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Items to be Completed:	**Due No Later Than:**
Read the assigned material	
Post an initial response to the Do First discussion question	Thursday 11:59 PM EST/EDT
Post responses to at least two classmates	Sunday 11:59 PM EST/EDT
Submit Assignment 6	Sunday 11:59 PM EST/EDT
Complete Exam 3	Sunday 11:59 PM EST/EDT

Module 7 **Database Processing Applications**

Objectives

When you complete this module, you should be able to:

- Describe the database processing environment.
- Describe how to setup a web database.
- Describe the basic concepts of the Extensible Markup Language.
- Describe how to use PHP to display database information on web pages.
- Explain how to create a system data source name.
- Explain different database access tools such as ODBC and ADO.NET.

Assignments

Items to be Completed:	**Due No Later Than:**
Read the assigned material	
Post an initial response to the discussion question	Thursday 11:59 PM EST/EDT
Post responses to at least two classmates	Sunday 11:59 PM EST/EDT
Submit Assignment 7	Sunday 11:59 PM EST/EDT

Module 8 **Big Data**

Objectives

When you complete this module, you should be able to:

- Describe the concepts of Big Data, structured storage, and the MapReduce process.
- Describe the concepts of data warehouses and data marts.
- Describe the basic concepts of business intelligence systems.

Assignments

Items to be Completed:	**Due No Later Than:**
Read the assigned material	
Post an initial response to the discussion question	Thursday 11:59 PM EST/EDT
Post responses to at least two classmates	Sunday 11:59 PM EST/EDT
Submit Assignment 8	Sunday 11:59 PM EST/EDT
Complete Exam 4	Sunday 11:59 PM EST/EDT