MASTER SYLLABUS

CITA 215 – Database Application and Concepts
CIP Code: 11.0802

Created by: Robert House
Updated by: Thomas Burl
A. **TITLE:** Database Applications and Concepts

B. **COURSE NUMBER:** CITA215

C. **CREDIT HOURS (Hours of Lecture, Laboratory, Recitation, Tutorial, Activity):**

   # Credit Hours: 3
   # Lecture Hours per Week:
   # Lab Hours per Week:
   Other per Week:

   Course Length (# of Weeks): 15

D. **WRITING INTENSIVE COURSE:**

E. **GER CATEGORY:**

F. **SEMESTER(S) OFFERED:** Spring/Fall

G. **COURSE DESCRIPTION:**

   In this course, students will learn the fundamentals of working with a database. Students will learn database organization. Students will learn to work with tables to extract data to answer questions – select, from, where, group by, having, order by. Students will learn to work with data types and database functions to enhance queries.

H. **PRE-REQUISITES/CO-REQUISITES:**

   a. Pre-requisite(s):
   b. Co-requisite(s):
   c. Pre- or co-requisite(s):

I. **STUDENT LEARNING OUTCOMES:**

<table>
<thead>
<tr>
<th>Course Student Learning Outcome [SLO]</th>
<th>PSLO</th>
<th>GER</th>
<th>ISLO</th>
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<tbody>
<tr>
<td>a. describe the organization of a database</td>
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<td>[5]</td>
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<td>b. identify the primary and foreign key</td>
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<td>[5]</td>
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<td>c. identify table relationships – one-to-one, one-to-many, and many-to-many</td>
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<td>[5]</td>
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<td>d. implement table joins to bring data together</td>
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<td>[2CA] [3]</td>
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<tr>
<td>e. filter data with basic and complex boolean expressions</td>
<td>7</td>
<td></td>
<td>[2CA] [5]</td>
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<td>f. group data to extract summary information</td>
<td>7</td>
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<td>[2CA], [5]</td>
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<td>g. developed a waterfall design (common table expression) to show record set transformation to provide data insight</td>
<td>7</td>
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<td>[2CA], [5]</td>
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<td>h. display mastery of data type conversions and database functions</td>
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<td>[5]</td>
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<td>KEY</td>
<td>Institutional Student Learning Outcomes</td>
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<td>ISLO</td>
<td>ISLO &amp; Subsets</td>
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<td>1</td>
<td>Communication Skills</td>
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<td>Oral [O], Written [W]</td>
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<td>Critical Thinking</td>
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<td>Critical Analysis [CA], Inquiry &amp; Analysis [IA], Problem Solving [PS]</td>
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<td>Information Management [IM], Quantitative Lit./Reasoning [QTR]</td>
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<td>Social Responsibility</td>
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<td>Ethical Reasoning [ER], Global Learning [GL], Intercultural Knowledge [IK], Teamwork [T]</td>
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<td>5</td>
<td>Industry, Professional, Discipline Specific Knowledge and Skills</td>
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J. **APPLIED LEARNING COMPONENT:**  Yes____  No____

If Yes, select one or more of the following categories:

- Classroom/Lab___
- Internship___
- Clinical Practicum___
- Practicum___
- Service Learning___
- Community Service___

Civic Engagement___
Creative Works/Senior Project___
Research___
Entrepreneurship___
(program, class, project)

K. **TEXTS:**
Murach's SQL Server 2019 for Developers
By Bryan Syverson, Joel Murach

L. **REFERENCES:**
3W School SQL - https://www.w3schools.com/sql/

M. **EQUIPMENT:** Computer Classroom

N. **GRADING METHOD:** A-F

O. **SUGGESTED MEASUREMENT CRITERIA/METHODS:**
Sql queries, exams, and quizzes

P. **DETAILED COURSE OUTLINE:**

A. Content

Q. **LABORATORY OUTLINE:**

I. Introduction to relational databases, SQL, and data
- Describe how data needs have historically driven many information technology developments.
- Describe the evolution of data storage media during the last century.
- Relate the idea of data as a corporate resource that can be used to gain a competitive advantage to the development of the database management systems environment.
- Identify the three main hardware components of a client/server system.
- Recognize the differences between DML and DDL statements
- State the three coding techniques that can make SQL code easier to read and maintain

II. **Retrieve data from a single table**
- Retrieve data from a database using SQL commands.
- Use compound conditions in queries.
- Use computed columns in queries.
- Use the SQL LIKE operator.
- Use the SQL IN operator.
- Sort data using the ORDER BY clause.

III. **Retrieving data from multiple tables**
- Code a join query with two or more tables
- Code a union query with two or more tables
- Show when column names need to be qualified.
- Demonstrate the differences between an inner join, a left outer join, a right outer join, a full outer join, and a cross join.
- Make use of the rules associated with Union queries
- Distinguish the use of the union, union all, intersect, and except

IV. **Summary Queries**
- write summaries queries with the Group BY and HAVING clause.
- recognize the difference between HAVING and WHERE in a summary query.
- demonstrate the use of ROLLUP and CUBE in a summary query.
- demonstrate the use of the Grouping Sets in a summary query.
- demonstrate the use of the OVER clause in a query.

V. **Sub Queries and common table expression**
- demonstrate knowledge of a simple sub query.
- demonstrate knowledge of a correlated sub query.
- determine the proper use for the simple or correlated sub query.
- identify the parts of the common table expression.
- implement a common table expression.

VI. **Manipulating data**
- Given the specifications for an action query, code the INSERT, UPDATE, or DELETE statement for doing the action.
- Use the MERGE statement to merge rows from a source table into a target table.
- Create a copy of a table by using the INTO clause of the SELECT statement.

VII. **Data Types and Functions**
- code queries that use data conversions functions
- summarize the data that can be stored in the various data types
- code queries that require a data transformation on a column
- define a function's role in a query

VIII.