CS M10DB: DATABASE MANAGEMENT SYSTEMS AND APPLICATIONS

Originator

Esmaail Nikjeh

College

Moorpark College

Attach Support Documentation (as needed)

CS M10DB_state approval letter_CCC000608533.pdf

Discipline (CB01A)

CS - Computer Science

Course Number (CB01B)

M10DB

Course Title (CB02)

Database Management Systems and Applications

Banner/Short Title

Database Mgmt Systems and App

Credit Type

Credit

Honors

No

Start Term

Fall 2020

Catalog Course Description

Introduces modern database concepts while emphasizing the relational database model. Includes such topics as design methodologies, normalization of tables to reduce redundancies, supertypes and subtypes to reduce nulls, data integrity, referential integrity, and using locks and other techniques for concurrency control in a multi-user database. Describes the factors that should be balanced during the design of a database. Documents databases, entity relationship diagrams, relational schemas, and data dictionaries are described. Applies the principles by performing exercises using MS SQL Server, MySQL, or other database management system. Uses SQL and other languages to create and fill tables, retrieve data, and manipulate it by stored programs.

Taxonomy of Programs (TOP) Code (CB03)

0706.00 - Computer Science (transfer)

Course Credit Status (CB04)

D (Credit - Degree Applicable)

Course Transfer Status (CB05) (select one only)

A (Transferable to both UC and CSU)

Course Basic Skills Status (CB08)

N - The Course is Not a Basic Skills Course

SAM Priority Code (CB09)

E - Non-Occupational

Course Cooperative Work Experience Education Status (CB10)

N - Is Not Part of a Cooperative Work Experience Education Program

Course Classification Status (CB11)
Y - Credit Course

Educational Assistance Class Instruction (Approved Special Class) (CB13)
N - The Course is Not an Approved Special Class

Course Prior to Transfer Level (CB21)
Y - Not Applicable

Course Noncredit Category (CB22)
Y - Credit Course

Funding Agency Category (CB23)
Y - Not Applicable (Funding Not Used)

Course Program Status (CB24)
1 - Program Applicable

General Education Status (CB25)
Y - Not Applicable

Support Course Status (CB26)
N - Course is not a support course

Field trips
Will not be required

Grading method
(L) Letter Graded

Alternate grading methods
(O) Student Option- Letter/Pass
(P) Pass/No Pass Grading

Does this course require an instructional materials fee?
No

Repeatable for Credit
No

Units and Hours

Carnegie Unit Override
No

In-Class

Lecture
Minimum Contact/In-Class Lecture Hours
43.75
Maximum Contact/In-Class Lecture Hours
43.75

Activity

Laboratory
Minimum Contact/In-Class Laboratory Hours
26.25

Maximum Contact/In-Class Laboratory Hours
26.25

Total in-Class

Total in-Class
Total Minimum Contact/In-Class Hours
70
Total Maximum Contact/In-Class Hours
70

Outside-of-Class

Internship/Cooperative Work Experience

Paid

Unpaid

Total Outside-of-Class

Total Outside-of-Class
Minimum Outside-of-Class Hours
87.5
Maximum Outside-of-Class Hours
87.5

Total Student Learning

Total Student Learning
Total Minimum Student Learning Hours
157.5
Total Maximum Student Learning Hours
157.5

Minimum Units (CB07)
3
Maximum Units (CB06)
3

Student Learning Outcomes (CSLOs)	
	Upon satisfactory completion of the course, students will be able to:
1	design small databases with primary and foreign keys and other constraints to be enforced by the database management system (DBMS).
2	design databases by employing normalization rules, supertypes and subtypes to reduce nulls, the order of rows and columns be arbitrary, and other rules to reduce redundancies.
3	create and drop tables; insert, delete, and update raw data; and select (retrieve) data using a relational DBMS.
4	employ procedures and commands to create, drop tables, and query one or more tables.

Course Objectives	
	Upon satisfactory completion of the course, students will be able to:
1	describe five file or database systems to store data.
2	describe redundancies and their adverse effects.
3	identify operations such as restrict, project, union, intersection, difference, divide, and join.
4	design small databases with primary and foreign keys and other constraints to be enforced by the database management system (DBMS).

5	design databases by employing normalization rules, supertypes and subtypes to reduce nulls, the order of rows and columns be arbitrary, and other rules to reduce redundancies.
6	design and document databases by using connectivity, cardinality, entity relationship diagrams, relational schemas, and data dictionaries.
7	describe what is meant by the degree of a relationship and its affect on design.
8	specify data types to store numeric data, strings of characters, dates, times, and others.
9	create and drop tables; insert, delete, and update raw data; and select (retrieve) data using a relational DBMS.
10	plan, code, and document user-generated stored functions, procedures, and triggers.
11	describe transaction management, concurrency control, deadlocks and locks.
12	describe how to install and configure Microsoft SQL Server.
13	employ procedures and commands to create, drop tables, and query one or more tables.
14	employ procedures and commands to insert, delete, and update raw data.
15	employ procedures and commands to update, manage transactions, and create indexes and views.
16	use procedures and commands to create stored functions, builtin functions, and procedures.

Course Content

Lecture/Course Content

6% - Introduction to files, databases, and database management systems.
  • lass rules and orientation to the computing lab

6% - File systems and databases
  • hierarchical, network, relational, bjectoriented

6% - The relational database model

10% - Entity relationship modeling
  • conceptual, internal, external

9% - Normalizing a database
  • first normal form through Boyce-Codd

6% - Data types for numeric, character, and date data in tables and variables

7% - Scripts and SQL commands to create, alter, and drop tables

7% - SQL commands to insert, update, and delete data

10% - PL/SQL programs that declare variables and symbolic constants, and programs that use selection statements, assignment statements, and loops

6% - Data manipulation language (DML) triggers

6% - Built-in functions

6% - User-generated, stored functions

6% - User-generated, stored procedures

9% - Transaction management and concurrency control

Laboratory or Activity Content

12% - Introduction to relational database management systems, keys, and other constraints

10% - Normalization of databases and other logical database design

6% - Creating and dropping databases

6% - Data types

6% - Creating, altering, and dropping tables

6% - Adding primary keys and other constraints

6% - Inserting, deleting, and updating data

6% - Transactions; creating and using views

6% - Selecting and grouping data

6% - Selecting data from several tables with inner and outer joins

6% - Creating indexes

6% - Creating scripts that use variables, assignment statements, IF statements, and loops

6% Creating user-defined stored procedures

6% Creating user-defined stored functions
6% Creating and using triggers

Methods of Evaluation

Which of these methods will students use to demonstrate proficiency in the subject matter of this course? (Check all that apply):

Problem solving exercises
Skills demonstrations

Methods of Evaluation may include, but are not limited to, the following typical classroom assessment techniques/required assignments (check as many as are deemed appropriate):

Individual projects
Objective exams
Other (specify)
Problem-solving exams
Skills demonstrations

Other

• Computer Programming (PL/SQL) Lab Assignments
• Classroom discussion
• Participation

Instructional Methodology

Specify the methods of instruction that may be employed in this course

Distance Education
Group discussions
Laboratory activities
Lecture
Other (specify)

Specify other method of instruction

• Group activities

Describe specific examples of the methods the instructor will use:

Instructor will use blackboard to lecture the concepts and computer to show the database examples like creating tables and using MS SQL to retrieve the data from the tables. Instructor will show some helpful video and power point tutorials with examples about writing SQL statements. Instructor will promote student discussion, group activities, use of Internet, Lab, and homework. Instructor will assess student understanding at frequent intervals throughout the learning process.

Representative Course Assignments

Writing Assignments

1. Using the database and tables in Employee and Job-Title database which you created in previous assignment, write SQL queries using Between, Like, and Union:
   • Write a SQL query that joins two tables in the example database and uses BETWEEN to restrict record selection (use salaries to restrict the data).
   • Write a SQL query that joins two tables in the example database and uses BETWEEN to restrict record selection (use hire dates to restrict the data).
   • Write a SQL query that joins two tables in the example database and uses LIKE to restrict record selection (use telephone area codes to restrict data).
   • Write a SQL query that joins two tables in the example database and uses LIKE to restrict record selection (use zip codes to restrict data).
   • Write a SQL query that uses UNION of the two tables to produce a third table.
   • Print out each query and its results along with storing them on a removable disk to use for a presentation in class. Be prepared to demonstrate your queries in class.

2. Create a SQL Server database given specific entitles, create the appropriate tables, fill the tables with data and write the proper SQL instructions to manipulate the data using the proper SQL instructions (select, update, JOIN...etc), write the appropriate SQL instructions to solve a given problem.

Critical Thinking Assignments

1. Utilize a database found within a web site. Corporate management within the company has failed to recognize the importance of the data within their database for decision support. The final project for this course will require you to evaluate a database of your choice. You should apply what has been learned during CSM10DBM.

2. Generally, we use normalization techniques when designing a database. Using the article "Ex Ante Evaluations of Alternate Data Structures for End User Queries: Theory and Experimental Test," discuss the disadvantages of normalizing the database to a high degree of normalization. Discuss whether there should be a hard and fast rule on when to stop normalizing.

- If you were going to create and normalize a database for your organization, would you follow all the steps indicated in the article "Build your Database on a Solid Foundation by Normalizing from the Start," or would you stop before you got to the end? Why did you make the decision you did?

3. In a script named CSM10DBM_LastName_FirstName.sql, use the built-in functions listed below. Do not include exactly the same statements as in my lecture notes. Note that 5*8 is an arithmetic expression and 'Jim' || ' Smith' is a string expression, not functions.

Reading Assignments

1. Utilize a database found within a web site.
   a. Corporate management within the company has failed to recognize the importance of the data within their database for decision support. The final project for this course will require you to evaluate a database of your choice. You should apply what has been learned during CSM10DB. Considerations should include, but not be limited to the following questions:
      i.   Are the tables normalized?
      ii. Are the relationships between the tables correct?
      iii. Do any of the tables need indexes?
      iv. Are the indexes correct?
      v.   Are additional tables required or can any tables be eliminated?
      vi. Additionally you will need to develop an SQL application that will aid the company's management team in the decision making process.
2. Generally we use normalization techniques when designing a database. Using the article "Ex Ante Evaluations of Alternate Data Structures for End User Queries: Theory and Experimental Test," discuss the disadvantages of normalizing the database to a high degree of normalization. Discuss whether there should be a hard and fast rule on when to stop normalizing.
   -If you were going to create and normalize a database for your organization, would you follow all the steps indicated in the article "Build your Database on a Solid Foundation by Normalizing from the Start," or would you stop before you got to the end? Why did you make the decision you did?

Outside Assignments

Representative Outside Assignments

1. Research and find some related articles to write a 3-5 page paper. Explain the differences between Access SQL, MS SQL Server 2016, Oracle, DB2, and MySQL? Summarize each Database System's function, requirements, expansion capabilities, companies using each (small list), how the database is being used, and the costs associated with its use.

2. Describe a situation in an organization in which Snap-Together Visualization described in an article of your choice for example "Visualization Schemas and a Web-Based Architecture for Custom Multiple-View Visualization of Multiple-Table Databases" could be used effectively. Do you think the benefits of using this technique could be realized in the short term? If not, how long would it take? -Choose two of the data modeling diagrams from the article to compare. Discuss some concrete examples of the differences and similarities between them. Which one of them would you choose if your manager said there was only time for one during the design process?

3. In a script named CSM10DBM_LastName_FirstName.sql, enter as comments your FileName, Student ID, and the date that you finished your program. Include comments throughout your script that concisely and thoroughly describe your code. Use a readable coding style with white space, indentation, and alignments.

Articulation

Equivalent Courses at other CCCs

College	Course ID	Course Title	Units
Glendale Community	CS/IS 185	Database Management Systems	3
Foothill College	CS 31A	Introduction to Database Management Systems	4.5
Los Medanos College	COMSC 126	Database Management Systems	3

District General Education

A. Natural Sciences

B. Social and Behavioral Sciences

C. Humanities

D. Language and Rationality

E. Health and Physical Education/Kinesiology

F. Ethnic Studies/Gender Studies

Course is CSU transferable
Yes

CSU Baccalaureate List effective term:
F2019

CSU GE-Breadth

Area A: English Language Communication and Critical Thinking

Area B: Scientific Inquiry and Quantitative Reasoning

Area C: Arts and Humanities

Area D: Social Sciences

Area E: Lifelong Learning and Self-Development

Area F: Ethnic Studies

CSU Graduation Requirement in U.S. History, Constitution and American Ideals:

UC TCA

UC TCA
Approved
Proposed

Date Proposed:
02/05/2019

IGETC

Area 1: English Communication

Area 2A: Mathematical Concepts & Quantitative Reasoning

Area 3: Arts and Humanities

Area 4: Social and Behavioral Sciences

Area 5: Physical and Biological Sciences

Area 6: Languages Other than English (LOTE)

Textbooks and Lab Manuals

Resource Type
Textbook

Classic Textbook
Yes

Description
Kellenberger, Kathi. Beginning T-SQL. 3rd ed. Apress, 2014.

Resource Type
Textbook

Classic Textbook
Yes

Description
Petkovic, Dusan. Microsoft SQL Server 2016: A Beginner's Guide. 6th ed. McGraw-Hill, 2016.

Library Resources

Assignments requiring library resources
Use of the Library's print and online resources to locate current articles in newspapers, magazines and scholarly journals in preparation for a report on aspects of database management systems practices such as comparing SQL and non-SQL databases.

Sufficient Library Resources exist
Yes

Distance Education Addendum

Definitions

Distance Education Modalities
Hybrid (51%–99% online)
100% online

Faculty Certifications

Faculty assigned to teach Hybrid or Fully Online sections of this course will receive training in how to satisfy the Federal and state regulations governing regular effective/substantive contact for distance education. The training will include common elements in the district-supported learning management system (LMS), online teaching methods, regular effective/substantive contact, and best practices.
Yes

Faculty assigned to teach Hybrid or Fully Online sections of this course will meet with the EAC Alternate Media Specialist to ensure that the course content meets the required Federal and state accessibility standards for access by students with disabilities. Common areas for discussion include accessibility of PDF files, images, captioning of videos, Power Point presentations, math and scientific notation, and ensuring the use of style mark-up in Word documents.
Yes

Regular Effective/Substantive Contact

Hybrid (51%–99% online) Modality:

Method of Instruction	Document typical activities or assignments for each method of instruction
Asynchronous Dialog (e.g., discussion board)	Instructor will email students with announcements about the course or an upcoming event. Students in turn may email the instructor with their questions or concerns.
E-mail	•Instructor will email students with announcements about the course or an upcoming event. Students in turn may email the instructor with their questions or concerns.
	•Students will email their projects/assignments to the instructor.

100% online Modality:

Method of Instruction	Document typical activities or assignments for each method of instruction
Asynchronous Dialog (e.g., discussion board)	Instructor will post a question, students will respond to the question.
E-mail	•Instructor will email students with announcements about the course or an upcoming event. Students in turn may email the instructor with their questions or concerns.
	•Students will email their projects/assignments to the instructor.
Other DE (e.g., recorded lectures)	Instructor may record the lectures and post them for students to view within a specified time frame.

Examinations

Hybrid (51%–99% online) Modality
Online
On campus

Primary Minimum Qualification
COMPUTER SCIENCE

Review and Approval Dates

Department Chair
10/02/2018

Dean
09/09/2018

Technical Review
01/31/2019

Curriculum Committee
02/05/2019

DTRW-I
09/12/2019

Curriculum Committee
MM/DD/YYYY

Board
10/08/2019

CCCCO
10/12/2019

Control Number
CCC000608533

DOE/accreditation approval date
MM/DD/YYYY