INST 327 - Database Design and Modeling - Section 0101
Fall 2017 - Tentative Syllabus

Personnel:	Vedat G. Diker (Dr. Diker)	Tammie Nelson	**Class meeting time and place:** Tuesday and Thursday afternoons *(8/29/2017 - 12/7/2017)* 2:00 PM to 3:15 PM in Martin (EGR) 0108
Office:	Hornbake 0217B		
Phone:	(301) 405-9814		
E-mail:	use ELMS messages	use ELMS messages	
Office Hours:	By appointment	By appointment	

Catalog Description

Pre-requisite: INST126, or CMSC122, or CMSC106
Pre- or co- requisite: INST 201 - Introduction to Information Science, or INST 301.
This course is an introduction to databases, the relational model, entity-relationship diagrams, user-oriented database design and normalization, and Structured Query Language (SQL). Through labs, tests, and a project, students develop both theoretical and practical knowledge of relational database systems.

Extended Course Description

A broad introduction to relational database systems, this course will provide students with a combination of conceptual understanding and technical practice. Students will learn about the relational model, which provides the logical framework for designing and querying relational databases. Students will also learn important technical and conceptual approaches to database design, including user-oriented design, requirements analysis and specification, entity-relationship modeling, and normalization. Students will put these fundamentals into action by learning and using the Structured Query Language (SQL) and a database management system (DBMS) to build, populate, and query a working database.

Student Learning Outcomes

Upon completion of the course, students will be able to:

- Create user-oriented database queries using the Structured Query Language (SQL)
- Describe the relational model as a logical system for structuring data for retrieval;
- Translate user needs into functional database requirements by using entity-relationship models that conform to the relational model;
- Build a working relational database using a database management system (DBMS);
- Normalize and de-normalize a relational database to optimize performance;
- Identify security issues in databases and develop approaches to address them.

Course Materials

- *Required Text:* Murach, J. (2015) *Murach's MySQL, 2nd ed.* Mike Murach & Associates.

- *Additional Readings and Other Resources*
  Chapters from various database design books and other resources may be assigned as needed. Such extra reading assignments will be announced if and when they occur. Please check the course site on Canvas (ELMS) for corresponding due dates for completing the extra reading assignments.

Course Activities

- *Daily Quizzes*
  There will be short quizzes either at the beginning or at the end of most class sessions.

- *Homework Assignments*
  There will be 4 to 6 assignments over the semester, each of which will include 2 to 4 questions. Most or all of the questions will be practical tasks, such normalizing a table, building or correcting an ERD, or writing SQL queries. The assignments are individual work. Although you may consult with your classmates and the instructor to develop general approaches to solving questions, you must work individually while you build, type, test and debug your answers. Assignment questions will be available on Canvas. Completed assignments will be submitted via Canvas, as well. Timely submission of the completed assignments is essential. The due date of each assignment will be stated clearly in the assignment description. If an assignment due date is a religious holiday for you, please let the instructor know as soon as the assignment is announced, so an alternate due date can be set for you.

- *Group Project*
  Students will work in 5-person teams to design and build a non-trivial relational database throughout the semester. Project-related work is central to this course, and 40% of graded work is based on the project. The project will involve identifying an end-user need for a relational database, reviewing and evaluating an existing, non-optimal database aimed at addressing the identified need, determining the requirements for the database, developing a deadline-oriented plan for building the database, and designing the logical specifications, building and populating the database, and developing queries/views that will showcase the capabilities of the database for fulfilling the identified user needs. Students will be assigned to groups randomly through the group feature in Canvas (ELMS). The groups will choose their topics from a list of possible project topics.

- *Mid-term Exam*
  A mid-term exam will be administered to test the students' understanding of data modeling and relational database concepts, as well as their SQL query developing skills. The mid-term exam may include conceptual questions such as those that ask for definitions of and comparisons between data modeling and relational database concepts, as well as query challenges that test students' SQL skills. Some of the questions may be related to students' work on the group project.

- *Final Exam*
  A final exam will be administered to test the students' understanding of data modeling and relational database concepts, as well as their SQL query developing skills. The final exam may include conceptual questions such as those that ask for definitions of and comparisons between data modeling and relational database concepts, as well as query challenges that test students' SQL skills. Some of the questions may be related to students' work on the group project.

Grading

Course grades will be assigned based on assignments, the term project, the midterm exam, and the final exam. Scores on each component will be combined to produce a single overall score for each student as follows:

Component	**Percentage**	
Daily Quizzes		6%
Assignments		20%
Group Project		40%
Database Review Report	*5%*	
Proposal	*5%*	
Proposal Peer Review	*5%*	
Progress Report	*5%*	
Final Database	*10%*	
Concluding Report	*10%*	
Mid-term Exam		17%
Final Exam		17%

Letter grades will be assigned using the following categories:

A+	97-100 pts.	C	73-76.9
A	93-96.9	C-	70-72.9
A-	90-92.9	D+	67-69.9
B+	87-89.9	D	63-66.9
B	83-86.9	D-	60-62.9
B-	80-82.9	F	less than 60
C+	77-79.9		

Policy on Academic Misconduct

Cases of academic misconduct will be referred to the Office of Student Conduct irrespective of scope and circumstances, as required by university rules and regulations. It is crucial to understand that the instructors do not have a choice of following other courses of actions in handling these cases. There are severe consequences of academic misconduct, some of which are permanent and reflected on the student's transcript. For details about procedures governing referrals and possible consequences visit http://osc.umd.edu/OSC/Default.aspx.

It is very important that you complete your own assignments, and do not share any files or other work. The best course of action to take when a student is having problems with an assignment question is to contact the instructor. The instructor will be happy to work with students while they work on the assignments.

University of Maryland Code of Academic Integrity

The University of Maryland, College Park has a nationally recognized Code of Academic Integrity, administered by the Student Honor Council. This Code sets standards for academic integrity at Maryland for all undergraduate and graduate students. As a student you are responsible for upholding these standards for this course. It is very important for you to be aware of the consequences of cheating, fabrication, facilitation, and plagiarism. For more information on the Code of Academic Integrity or the Student Honor Council, please visit http://shc.umd.edu/SHC/Default.aspx.

Special Needs

Students with disabilities should inform the instructors of their needs at the beginning of the semester. Please also contact the Disability Support Services (301-314-7682 or http://www.counseling.umd.edu/DSS/). DSS will make arrangements with the student and the instructors to determine and implement appropriate academic accommodations. Students encountering psychological problems that hamper their course work are referred to the Counseling Center (301-314-7651 or http://www.counseling.umd.edu/) for expert help.

Course-Related University Policies

UMD's Office of Undergraduate Studies has developed a guide to provide students with resources and information relevant to participation in a UMD course. You can access the guide at http://www.ugst.umd.edu/courserelatedpolicies.html.

Course Schedule (This schedule is for planning purposes and may change. See Canvas (ELMS) for current information and deadlines.)

The class meets twice a week for 75 minutes per session. This schedule is subject to change.

Session	Date	Topics	Readings Due	Non-project Work	Project Work
1	Aug. 29 (Tu)	Introduction, Software installation and tests	Appendix A Appendix B	Download MySQL Server and MySQL Workbench	
2	Aug. 31 (Th)	Relational database concepts	Chapter 1		Introduction of Group Project Process
3	Sep. 5 (Tu)	MySQL Server and MySQL Workbench	Chapter 2	All software installed, configured, and tested	
4	Sep. 7 (Th)	Retrieving data from a single table	Chapter 3		
5	Sep. 12 (Tu)	Retrieving data from multiple tables	Chapter 4		
6	Sep. 14 (Th)	Review – Ch. 3 & Ch. 4	---		
7	Sep. 19 (Tu)	Inserting, Updating, and Deleting data	Chapter 5	Assignment 1: Develop queries (one or more tables)	
8	Sep. 21 (Th)	Aggregate functions, Summary queries	Chapter 6		
9	Sep. 26 (Tu)	Subqueries	Chapter 7		
10	Sep. 28 (Th)	Review – Ch. 6 & Ch. 7	---		
11	Oct. 3 (Tu)	Data types, Functions	Chapter 8, Chapter 9		Project Review Report due (Assess an existing project)
12	Oct. 5 (Th)	Conceptual and logical database design	Chapter 10, pp. 278-293		
13	Oct. 10 (Tu)	Normalization	Chapter 10, pp. 294-303	Assignment 2: Develop queries (C*UD; summary)	
14	Oct. 12 (Th)	Normalization (cont.)	---		Project Proposal due (Propose project plan) **DUE 10/15**
15	Oct. 17 (Tu)	Entity-Relationship diagrams	Chapter 10, pp. 304-311		

16	Oct. 19 (Th)	Mid-term Exam			
17	Oct. 24 (Tu)	Entity-Relationship diagrams (cont.)	---	Assignment 3: Develop queries (with subqueries), Normalize flat-file database	
18	Oct. 26 (Th)	Creating and altering databases and tables	Chapter 11		Project Proposal Peer-review due (Assess another group's proposal)
19	Oct. 31 (Tu)	Creating and altering db.s and tables (cont.)	---		
20	Nov. 2 (Th)	Indexes	---		
21	Nov. 7 (Tu)	Views	Chapter 12	Assignment 4: Develop Entity-Relationship model	
22	Nov. 9 (Th)	Stored program development	Chapter 13		
23	Nov. 14 (Tu)	Transactions, Concurrency, Locking	Chapter 14		Project Progress Report due (Report project progress)
24	Nov. 16 (Th)	Stored procedures, Functions	Chapter 15		
25	Nov. 21 (Tu)	Triggers, Events	Chapter 16		
--	Nov. 23 (Th)	**Thanksgiving recess NO CLASS**	---		
26	Nov. 28 (Tu)	Database administration	Chapter 17	Assignment 5: Develop stored procedures; triggers	
27	Nov. 30 (Th)	Database security	Chapter 18		
28	Dec. 5 (Tu)	Backing up and restoring databases	Chapter 19		Project DB and Report due (Report project work)
29	Dec. 7 (Th)	Course wrap-up	---		

This schedule is for planning purposes and may change. See Canvas (ELMS) for current information and deadlines.