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

Instructors:	Vedat G. Diker (Dr. Diker)	Karen Boyd	**Class meeting time and place:** Tuesday and Thursday afternoons *(1/26/2017 - 5/11/2017)* 3:30 PM to 4:45 PM in Susquehanna 1117
Office:	Hornbake 4111F	Hornbake 4120M	
Phone:	(301) 405-9814		
E-mail:	vdiker@umd.edu	klboyd@umd.edu	
Office Hours:	By appointment	By appointment	

Catalog Description

Pre-requisite: INST126, or CMSC122, or CMSC106
Pre- or co- requisite: INST 201 - Heroes and Villains in the Age of Information (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. ISBN:

- *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. You will have about a week to work on and complete each assignment. The assignments are individual work. That means that although you may consult with your classmates and the instructors to develop general approaches to solving questions, you are expected to work individually while you build, type, test and debug your answers. Assignment questions will be made 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 instructors know as soon as the assignment is announced, so an alternate due date can be set for you.

- *Group Project*
  Students will work in 3- to 5- student teams to design and build a non-trivial relational database over the semester. The project will involve identifying an end-user need for a relational database, 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. Groups will be asked to find and articulate their own project topics, but they may seek the instructors' input while identifying possible topics and choosing the topic to be used. Students will be assigned to groups by the instructors.

- *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 textual 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.

- *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 textual 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.

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		10%
Assignments		30%
Group Project		30%
Proposal	*3%*	
Progress Report	*6%*	
Concluding Report	*15%*	
Poster/Presentation	*6%*	
Mid-term Exam		15%
Final Exam		15%

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 such referrals and possible consequences for the student please 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 instructors. The instructors 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

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

Session	Date	Topics	Readings Due	Work Due
1	Jan. 26 (Th)	Introduction, Software installation and tests	Appendix A Appendix B	Download MySQL Server and MySQL Workbench
2	Jan. 31 (Tu)	Relational database concepts	Chapter 1	
3	Feb. 2 (Th)	MySQL Server and MySQL Workbench	Chapter 2	All software installed, configured, and tested
4	Feb. 7 (Tu)	Retrieving data from a single table	Chapter 3	
5	Feb. 9 (Th)	Retrieving data from multiple tables	Chapter 4	
6	Feb. 14 (Tu)	Inserting, Updating, and Deleting data	Chapter 5	
7	Feb. 16 (Th)	Aggregate functions, Summary queries	Chapter 6	Homework Assignment 1
8	Feb. 21 (Tu)	Project topic brainstorming session	---	
9	Feb. 23 (Th)	Subqueries	Chapter 7	Homework Assignment 2
10	Feb. 28 (Tu)	Data types, Converting data types	Chapter 8	
11	Mar. 2 (Th)	Functions	Chapter 9	
12	Mar. 7 (Tu)	Conceptual and logical database design	Chapter 10, pp. 278-293	Project Proposal
13	Mar. 9 (Th)	Normalization	Chapter 10, pp. 294-303	Homework Assignment 3
14	Mar. 14 (Tu)	Normalization (cont.)	---	
15	Mar. 16 (Th)	Mid-term Exam		
---	Mar. 21 (Tu)	Spring Break		
---	Mar. 23 (Th)			
16	Mar. 28 (Tu)	Entity-Relationship diagrams	Chapter 10, pp. 304-311	
17	Mar. 30 (Th)	Entity-Relationship diagrams (cont.)	---	Homework Assignment 4

18	Apr. 4 (Tu)	Creating and altering databases and tables	Chapter 11	
19	Apr. 6 (Th)	Indexes	---	Homework Assignment 5
20	Apr. 11 (Tu)	Views	Chapter 12	
21	Apr. 13 (Th)	Stored program development	Chapter 13	
22	Apr. 18 (Tu)	Transactions, Concurrency, Locking	Chapter 14	Project Progress Report
23	Apr. 20 (Th)	Stored procedures, Functions	Chapter 15	
24	Apr. 25 (Tu)	Triggers, Events	Chapter 16	
25	Apr. 27 (Th)	Database administration	Chapter 17	Homework Assignment 6
26	May 2 (Tu)	Database security	Chapter 18	
27	May 4 (Th)	Backing up and restoring databases	Chapter 19	Project Database and Report
28	May 9 (Tu)	Project Presentations		Project Poster or Presentation
29	May 11 (Th)	Project Presentations	---	

This schedule is for planning purposes and may change.

See Canvas (ELMS) for current information and deadlines.