CS 450 Database Concepts

Fall 2022

Instructor: Dr. Wassim Itani
E-Mail: witani2@gmu.edu
Office Hours: Thursday 11:00 – 12:00 or by appointment
Prerequisites: C or better in CS 310 (Data Structures) and CS 330 (Formal Methods and Models)

Class Time & Location
Section 001: Thursday 16:30 - 19:10 Horizon Hall 2009
Section 002: Monday & Wednesday 09:00-10:15 MTB 1005

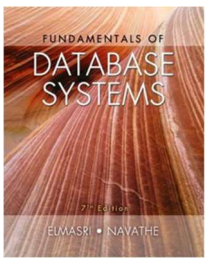
Piazza
Section 001 course link: piazza.com/gmu/fall2022/cs450001
Access code: itani_450001
Section 002 course link: piazza.com/gmu/fall2022/cs450002
Access code: itani_450002

GTA
Section 001:
Umama Dewan
E-mail: udewan@gmu.edu
Office hours: TBA
Section 002:
Prabin Bhandari
E-mail: pbhanda2@gmu.edu
Office hours: TBA

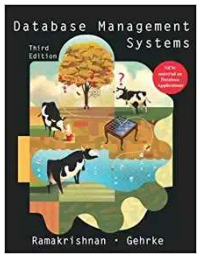
Important Note: You are expected to check your GMU Blackboard on a daily basis for any announcements made for this class including but not limited to, announcements for homework, assignments, exams, etc.

Course Information

Required Textbook: (We will be relying on material from the following two textbooks. Choosing **one** of the two is enough to keep track of the lecture material)

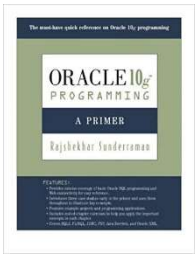


Fundamentals of Database Systems, Ramez Elmasri, Shamkant B. Navathe, 7th edition, ISBN-13: 9780133970777, Pearson, 2015.



Database Management Systems (3rd ed.), Ramakrishnan, R., and Gehrke, J., ISBN-13: 978-0071231510, McGraw-Hill: New York, 2003.

Recommended Textbook:



Oracle 10g Programming: A Primer, Rajshekhar Sunderraman, ISBN-13: 978-0321463043, Pearson, 2007.

Computing Requirements

- Students are expected to have access to a Windows or Macintosh computer with at least 2 GB of RAM and to a fast, reliable broadband Internet connection (e.g., cable, DSL).
- Access to Oracle DBMS via GMU: GMU Labs Oracle
- VPN setup: GMU Labs VPN
- Oracle reference material: Oracle Database
- Additional software requirements will be announced by the professor as needed.

Catalog Description

Covers basics to intermediate knowledge for the design, implementation, and use of relational database systems. Topics include the Entity-Relationship (ER) and Entity-Enhanced Relationship (EER) models for database design, Relational Algebra (RA), Structured Query Language (SQL), SQL programming techniques, functional dependencies and normalization, object and object-relational databases, and security. Students will practice to design, develop, and implement a relational ORACLE database and use the database for queries, transaction processing, and report generation.

Course Outcomes:

- Knowledge of fundamental concepts of file and database management.
- Knowledge of database design principles, and ability to model real-world environments using the ER model.
- Knowledge of the formal principles of the relational database model and its query languages, and ability to design relational databases and express queries in the relational algebra and calculus.
- Knowledge of the Structured Query Language (SQL) and database programming principles, and ability to author SQL queries and implement 3-tier database applications using the Oracle database system, Java Servlets/JSP, and Android.
- Knowledge of the basic principles of the mathematical theory of database design, and ability to design databases that adhere to Boyce-Codd Normal Form.
- Experience in the complete database creation process: from database design, to database construction, to database programming.
- Work as part of a team to develop small programming projects in topics related to the

course material

Course Grade:

Activity	Weight
Participation and Attendance (might include small quizzes)	10%
Homework Assignments (Optional and not Graded)	0%
4 Project Components	35%
Midterm Exam	25%
Final Exam	30%

The letter grade will be assigned according to the following scale:

A+	>98
A	92-98
A-	90-92
B+	88-90
B	82-88
B-	80-82
C+	78-80
C	72-78
C-	70-72
D	60-70
F	<60

Homework Assignments

A set of 4 homework assignments will be provided over the semester. These assignments are optional and not graded. However, it is highly recommended that students solve these assignments in their entirety as they resemble questions to appear in the midterm and final exams. Statistically students solving the homework assignments and checking their answers help them earn a better course grade.

Project

A set of 4 project components will be assigned during the semester. Some components should be developed individually while others can be developed in a team. The full project details will be posted on Blackboard. Late project submissions are NOT allowed. A submission is considered on time if submitted electronically on Blackboard on or before required submission date/time.

Exams

The course comprises a midterm and a final exam. There will be no makeup exams. Arrangements can be made in case of emergency, but the student needs to inform the professor in advance unless the emergency is unexpected.

Class Attendance and Classroom Policy

Class attendance and active participation is required. The student is strongly encouraged to ask questions during the lectures or using online using Piazza, and this is viewed as part of the class participation. If the student is absent from class, he or she is responsible for any materials covered, handouts and any announcements made in class, regarding (but not limited to) class schedule, assignments, project and exams. Cell phones must be turned off during class.

Collaboration Policy

All assignments and projects must be completed individually, if they are not assigned to teams. On individual assignments, the students MAY NOT work together. The students may ask each other for general advice, but they may not share final answers. Word to word copy from another student or from the work of previous years is considered cheating and "We did the homework together" is not an excuse.

Disability Accommodations

If you are a student with a disability and you need academic accommodations, please notify me and contact the Office of Disability Services (ODS) at 993-2474, http://ods.gmu.edu. All academic accommodations must be arranged through the ODS.

Honor Code Statement

Please be familiar with the GMU Honor Code. In addition, the CS department has its own Honor Code policies. Any deviation from this is considered an Honor Code violation. All graded work must be your own effort. Any attempts at cheating will not be tolerated and will be turned in to the Honor Committee with significant penalty recommended. The usual recommendation is grade of F in the course.

Tentative Course Outline:

Check your Blackboard course page for the tentative course schedule

*Note: This syllabus is subject to change. Any changes will be announced. It is the student's responsibility to obtain the information on the changes applied.