CS 550-002: Database Systems (Spring 2017)

(syllabus v1.0 - 1/03/2017)

Professor: Gene Shuman

Course Description

An introduction to database management with a focus on architecting databases and using them in applications. Topics to be covered include: data modeling with the Entity-Relationship model; the relational model and its formal languages; SQL and application programming and protocols; the theory of database design; and related special topics.

Class Time and Location

Monday, 7:20 – 10:00 pm
Arts Building (AB) 2026

Instructor

Dr. Gene Shuman
Email (the best way to contact me): gshuman@gmu.edu / gshuman [AT] gmu [DOT] edu
(Put "CS500:*your name*" in the email subject line)
Phone: 703-359-0836 (2nd best)
Office Hours: Before or after class, or by appointment

GTA

TBD
Email: TBD
Office Hours: TBD
Office: TBD

Prerequisites:

1. CS 310 (Data Structures) AND CS 330 (Formal Methods and Models), or
2. INFS 501 (Discrete Mathematics), 515 (Computer Architectures/Organization), 519 (Program Design / Data Structures), AND SWE 510 (Object-oriented Programming in Java)

You must satisfy the course prerequisites to register for and stay in this course with a grade of B or better in each, or produce evidence (e.g., transcript, acceptance letter) that one or more of these courses have been waived. If you have specific questions, please meet with your academic advisor.

Textbooks

1. *(Required) Database Systems - An Application-Oriented Approach, Complete Version, 2nd Ed.*
   Kifer, Bernstein, and Lewis
   Addison-Wesley/Pearson, 2006
   ISBN-10: 0321268458
   ISBN-13: 9780321268457
2. *(Optional/helpful) Oracle 10g Programming: A Primer*
   Sunderraman
   Addison-Wesley, 2008
   ISBN-10: 0321463048
   ISBN-13: 978-0321463043

Exams

There will be one midterm exam and one final exam covering lectures and readings. All exams are in class, closed book, and must be taken at the scheduled time and place. Missed exams cannot be made up. The final exam is comprehensive.

Grading

Assignments/Projects: 35%
Midterm: 30%
Final: 35%

Other course requirements and things to know while taking this class

1. There will be 4 to 6 outside assignments, some involving programming.
2. Most assignments require access to a DBMS system such as Oracle. You should all have access to GMU's Oracle system – please verify this well before the first programming assignment is due. All Oracle homework assignments must run correctly on the GMU Oracle instance running in the labs.
3. Late submissions of assignments are NOT accepted unless agreed to by the instructor before the due time. (A submission is considered late if it is not handed in before lecture begins on the due date.)
4. Be sure to check for syllabus updates at least weekly. Class lectures will mostly follow the schedule, but there may be occasional variations.
5. I intend to use Blackboard to post assignments and updates.
6. Chapter readings are listed in the class schedule. Keep your textbook reading current so as to synchronize with the class lectures. I suggest reading the material before or, if not possible, immediately after the lecture. Do NOT wait until a day or two before an exam to catch up on missed reading – learning is best when done in many sessions or layers, not in one big "cram" session.

Working together vs. individually

For this class homework and exams require individual work. Study groups are *encouraged*, but homework solutions and write-ups MUST be the result of individual effort. Similarly, study groups for examinations are encouraged. However, both exams are individual effort and closed book.

Honor Code Statement

The GMU Honor Code is in effect at all times. In addition, the CS Department has further honor code policies regarding programming projects. Any deviation from the GMU or the CS department Honor Code is considered an Honor Code violation. The surest and fastest way to **fail** this class is to cheat on an exam or hand in someone else's work as your own.

Learning Disability Accommodation

If you have a documented learning disability or other condition that may affect academic performance, make sure this documentation is on file with the Office of Disability Services and then discuss with the professor about accommodations.

Useful websites

Volgenau School of Engineering (Computing Resources) for VSE computing labs, accounts, and Oracle DBMS information. Click on student FAQs, then "Oracle" on how to access GMU's Oracle instance.

Tentative Schedule (may change during the semester – check for updates)

Week	Date	Topic (Textbook Readings)	Additional information/notations
1	1/23	Introduction (Ch. 1, 2)	
2	1/30	ER Model (Ch. 4.1-4.4)	
3	2/6	Relational and ER Models (Ch.3, 4.5)	
4	2/13	Relational Algebra (Ch. 5.1)	
5	2/20	Relational Calculus (Ch. 13.1-13.4)	
6	2/27	Midterm Review	
7	3/6	Midterm Exam	
-	3/13	Spring break – no class	
8	3/20	SQL – basic (Ch. 5.1-5.3)	
9	3/27	SQL – nested queries (Ch. 5.1-5.3)	
10	4/3	SQL – aggregate queries (Ch. 5.1-5.3)	
11	4/10	Functional Dependency (Ch. 6.1-6.8)	
12	4/17	Normalization (Ch. 6.1-6.8)	
13	4/24	Special Topic/TBD	
14	5/1	Special Topic/Final Review	
15	5/15	Final Exam (7:30 – 10:15 pm)	