

CS 4400 Introduction to Database Systems - Fall 2017

Instructor:

Monica Sweat sweat@cc.gatech.edu CCB 131

Head TA:

Jonathan Jemson jonathanjemson@gatech.edu

Teaching Assistants: Names, schedule, and location be added shortly (there are 17 TAs!)

Course Content:

We introduce the fundamental concepts necessary for the design and use of modern database systems in today's large-scale enterprise applications. We examine the concepts in the order that we typically encounter them in the actual database design process. We start with the problem of conceptually representing data that is to be stored in a database. From there, we see how the data in a conceptual data model can be converted to a database specific model (e.g., the relational data model). We also discuss various forms for relations that possess good properties. We see how to use the relational database language SQL to define the relations and to write SQL statements to insert, delete, retrieve and update the data. We also examine some of the fundamental storage structures that are used in relational database systems. We end the course with a discussion of some advanced topics in the database management area.

Prerequisite: Basic programming skills. Knowledge of GUI programming is helpful.

Text, Notes, Resources:

- Required Text: Fundamentals of Database Systems, 7th (or 6th) edition, Elmasri & Navathe, Addison-Wesley, 2016.
- Chapter by Chapter Slides on T-Square
- Database Design Methodology Notes on T-Square
- Sample Quizzes on T-Square

Class Project: Will be released on T-Square (coming soon)

Grading Details

Quizzes: Quiz 1-4 60% (15% each)

Project: Phase I 10%,
Phase II 10%,
Phase III 20% (GUI based - heavy) OR
5% (non-GUI based - light)

Final Exam: 15% (Only for students doing the Lightweight version of the project).
If you do the heavyweight version then you cannot take the final exam

Regrade Deadline: Once graded phases and/or quizzes are returned, there is a one week deadline during which you can contest your grade. This clock starts not when you personally get your returned paper, but when the papers are returned to the class in general.

SLS Affiliation: This course is part of Georgia Tech's Serve-Learn-Sustain (SLS) initiative, which provides students with opportunities to combine their academic and career interests with their desire to make worthwhile contributions to the world and build sustainable communities where people and nature thrive, in Georgia, the United States, and around the globe. More information about SLS can be found at www.serve-learn-sustain.gatech.edu. Visit the website to sign up for the [SLS Email List](#), view the full list of [affiliated courses and projects](#), and find links to Facebook, Instagram and Twitter.



Team Project: You will design and implement a database application using the MySQL/PHP relational database system available by the College of Computing. The Project must be done as a team of 3 to 4 students. You are allowed to form teams across the two sections of the class.

We will follow a typical database design methodology for this project. Notes describing the methodology will be available via the class web page on T-square.

The project will consist of 3 phases (deliverables) as well as a final demonstration to the TA as scheduled. All team members must be present for the final demo of the semester-long project. Any team member not present will lose 10 points from Phase 3. The team members that are present will not be penalized for this issue.

At the start of the demo, the team must tell the TA if this is to be judged (and then weighted) as a lightweight version of the project or a heavyweight version of the project. This decision is not allowed to be changed once the demo begins. Meaning, if a team does poorly attempting to demo a heavyweight version, that team will NOT be allowed to then say they want to be graded as though it were a lightweight version. If at the start of the demo the choice was made to be judged as heavyweight, it will indeed count 20% of every team member's grade, and no team member will be allowed to take the final exam.

Think long and hard if you believe you have a complete and proper heavyweight project completed.

If a member of the team does not carry his/her weight, then the team may kick out that member at the end of Phase I or Phase II, only. The course instructor and head TA must be notified of this.

Project Peer Evaluation:

For each phase of the project, each team member will submit a peer evaluation of the other team members. This evaluation will be taken into account when determining the grade for each team member.

If all team members do an equal amount of work, then each will receive the same grade for that phase of the project.

On the other hand, if one team member does not do an equal share of the work, then that member's grade will be lowered.

Project Collaboration:

Students within a project team obviously will collaborate closely with each other to work as a team for each phase of the project. No collaboration of any kind whatsoever is allowed outside the team except as noted here. Students are allowed to consult with the current TAs and instructor assigned to work with CS4400. Students are expressly forbidden to collaborate across teams or to collaborate with others outside the course. Any violation of this policy will be reported to the Dean of Students without exception.

Professionalism:

I expect every student to behave in a professional manner befitting Georgia Tech. Your behavior matters, and poor behavior can result in a letter grade drop for the course. I expect you to be aware of and abide by Georgia Tech's Faculty Expectations. Lack of professionalism that crosses over into academic misconduct or violations of the code of conduct may be more severe and will involve the Dean of Students Office.

Topics	Chapters 7th Edition	Chapters 6th Edition	Chapters 5th Edition
Basic concepts - data independence, 3 level database architecture, database system components	1, 2	1, 2	1, 2
Conceptual database level - Entity-Relationship Model	3, 4	7, 8	3, 4
DBMS Design Methodology	notes	notes	notes
Relational Data Model, Algebra and Calculus	5, 8	3, 6	5, 6
SQL Query Language	6, 7	4, 5	8
Mapping from ER Model to Relational Model	9	9	7
Relational database design - Normal Forms, Functional Dependencies	14, 15	15, 16	10, 11
Internal database level - storage structures	16, 17	17, 18	13, 14

IMPORTANT DATES - all dates are tentative
Mark these dates now on your calendar! Makeups are rarely granted.

Quiz & Topics	Date	7th Ed. Reading	6th Ed. Reading
1 DB Concepts & ER/EER Model	September 14 (week 4)	1, 2, 3, 4	1, 2, 7, 8
2 Relations, Algebra & Calculus	October 12 (week 8)	5, 8	3, 6
3 SQL and ER to Relational Mapping	November 7 (week 12)	6, 7, 9	4, 5, 9
4 Normalization, FDs, Algorithms	November 28 (week 15)	14, 15	15, 16

Project	Due Date
Phase I	September 28 (week 6)
Phase II	October 26 (week 10)
Phase III	December 3 (end of week 15)

Project Demo Dates: December 4, 5.

All team members must be present for the final demo of the semester-long project. Any team member not present will lose 10 points from Phase 3. The team members that are present will not be penalize for this issue.

Final Exam Dates:

Section A - December 14 (Thursday) 11:30am-2:20pm

Section B – December 7 (Thursday) 2:50pm-5:40pm