Introduction to Database Systems

CS 4400 Syllabus

Spring 2024

Useful Links:

Link to schedule (subject to frequent changes): CS4400 Living Schedule_Spring 2024

Link to TA office hours schedule: available soon

Office Hours located at CCB 208

INSTRUCTOR:

Melinda McDaniel

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Office: CCB 259 Office Hours: **TBA**

HEAD TA:

Prit Patel

Email: ppatel493@gatech.edu

Please email for any questions or meeting requests!

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 including a discussion about secure computing as it relates to database systems and ways to improve the efficiency of these systems.

PREREQUISITES:

Basic programming skills

TEXT, NOTES, RESOURCES:

- Fundamentals of Database Systems, 7th (or 6th) edition, Elmasri & Navathe, Addison-Wesley, 2016. An electronic version of the text is acceptable. There will be readings from this book linked with lectures so you may want to have a copy.
- Dr. McDaniel's slides will be provided
- Handouts will be made available and are required reading.

GRADING DETAILS:

- 10 percent of your grade is from class participation: Daily assignments begun during lecture and due 15 minutes after your assigned section.
- 45 percent of your grade is from projects. The course project is broken up into 3 mandatory phases each of which will count for 15% of your grade.
- 45 percent of your grade is from exams. The course will have 3 exams throughout the course of the semester. Each exam will be worth 15% of your grade.
- **OPTIONAL:** If you are not happy with your grade at the end of the semester. We will allow you to take a Cumulative Final Exam or complete a fourth phase of the course project. This will yield each exam being worth 10% of your course grade and the final exam/fourth project phase being worth 15%.

Standard letter grade cutoffs apply - we do not round grades:

- A: 90% and above of the total course points
- B: 80% and above of the total course points
- C: 70% and above of the total course points
- D: 60% and above of the total course points
- F: less than 60% of the total course points

If you are taking the course pass/fail in order to pass the course you need >75%.

Course Project

You will work as a team to design and implement a database application using the MySQL Relational Database Management System. It is important to understand that we expect the high quality deliverables that should come from a team working together to design, implement and test their system. Good teamwork requires strong collaboration, and does not equate to simply dividing the work across the team members, and then working separately while expecting a good result.

The project must be completed as a team of four or five(4-5) students. You are allowed to "self-form" teams. Later, I'll close the "self-formation" period (e.g., before the beginning of Phase 1) so that I can form teams with all of the remaining students.

We will follow a typical database design methodology for the project. Notes describing the methodology will be provided. The project will consist of three mandatory phases (Phases 1 through 3) and one optional phase (Phase 4). The project phases will be:

- Phase 1: Develop an Extended/Enhanced Entity-Relationship Diagram (EERD) based on the provided project requirements.

- Phase 2: Develop a set of Relational Schema and SQL Physical Schema based on a provided EERD; also, transform and upload a provided dataset into your database.

- Phase 3: Develop the Structured Query Language (SQL) views, queries and transactions needed to support an application based on a provided database and dataset.

- Phase 4 (optional): Develop a fully-fledged application with a Graphical User Interface (GUI) (e.g., web-based, desktop-based) building on your work from Phase 3 of the project with provided interface guidance.

CATME Team Building & Feedback Surveys

Early during the course, we ask some students to fill out a CATME Team Building Survey. The data collected from these surveys is used by the CATME system to help form teams as effectively as possible by considering schedules, team structure preferences, etc.

Later during the course, we ask all students to fill out one or more CATME Team Feedback Surveys. These data collected from these surveys is used to evaluate how well the members of a team worked with their peers on the course project, and have a significant impact on the Course Participation grade for each team member. If all team members do a reasonably equitable amount of work (which is the most frequent case), then each will receive the same participation score. On the other hand, if some members do not do an equitable share of the work (i.e., "carry their

weight"), then those member's participation scores will very likely be significantly lower than their teammate's participation scores.

Also, most teams choose to continue working together through all of the project phases. If "friction" arises between some of the team members that can't be resolved in a peaceful and positive manner, then those team members should approach the Instructor to consider other options.

Project Late Submission Guidelines

This does not apply to participation quizzes/assignments.

Late submissions will result in points being deducted from your score. There's no need to alert us or request permission if you are planning to submit an assignment late per this policy.

- Up to 24 hours late will result in your final score for that assignment being deducted by 5 points.
- Up to 48 hours late will result in your final score for that assignment being deducted by 10 points.

Submissions beyond 48 hours late will not be accepted, resulting in a score of zero (0).

Assignment Deadlines & Requests for Exceptions

This course will have a NO-MakeUp policy. Please read below for details:

- If you miss an exam or a homework assignment without a valid excuse, then you will receive a zero (0) for that event.
- Only Dean's Office/Institute-level exceptions will be made for missed exams or homework assignments.
- Events such as *vacations*, *weddings*, *graduations*, *errands*, *work conflicts*, *sleeping through your alarm*, *alarm malfunctions*, ***forgetting to submit***, *forgetting the date or time of an exam*, or *not being aware of the assignment* are all ***NOT valid excuses***.
- Documented *incapacitating illness*, *death in the immediate family*, *judicial procedures*, *military service*, or *official school functions,* and *properly-documented religious holidays* are considered ***valid excuses***.
- **You must inform your professor(s) the first week of the semester in writing if you will be observing any religious holidays** during the semester, especially if they conflict with any of the exam or project presentation dates.
- If you are absent due to official Georgia Tech business, please forward the official documentation to the professor in an email stating the dates you will be absent.
- All situations must be referred to the Dean of Students Office for verification. You should contact the Dean of Students (https://studentlife.gatech.edu/) with your documentation, and

they will inform you of the proper procedures. Then the Dean of Students Office will contact your professor(s) directly with any accommodations to be provided.

- **The final decision regarding any request for an exception is made solely at the discretion of your professor.**
- If you take an exam, we will assume you are well enough for your performance to accurately reflect your knowledge and you will NOT be allowed to retake the exam after the fact based on reasons along the line of "...I didn't feel well at the time...".
- Any request for exceptions to the no-makeup policy must be made in advance of the assessment, unless it is physically impossible.

  If you are granted a valid exception from the Deans Office the Final Exam will be treated as the makeup for that exam.

Regrade Request Deadline & Process

Once grades are released the following 24 hours will be the review period. In this period students **can not** submit a regrade request. Students should review the grading rubric, their **own** submission, alongside any comments left by the grader. Any regrade requests that are submitted during this period will not be addressed.

After the culmination of the 24 hour review period students are able to submit a regrade request. The process by which to file a regrade request will be made available via an announcement. Regrade request will be due **7 days after the release of grades by EOD** (11:59 PM Eastern Time). It is your responsibility to check Canvas frequently.

You may request a regrade of your assignment if you feel that it is warranted through the following process:

- A regrade request begins by making your request to the TA who evaluated your work.
- Regrade requests are valid if – and only if – they address one or more aspects of the assignment which are factually in error. Requests based simply on the desire for a higher grade (e.g. "We think that we shouldn't have lost that many points for that error…") will not be supported.
- Your request must identify the specific aspects that you believe should be re-evaluated and must also include the reasons why you feel the re-evaluation is warranted.
- Please be aware that if you submit your assignment for re-evaluation, then the TA (or Instructor) is allowed to consider and re-evaluate the entire assignment as required to ensure that the overall evaluation, and the corresponding grade, is fair and consistent.
- If you do not feel your issue has been resolved after contacting the (original) evaluating TA, then you may escalate the issue by emailing the Head TA.
- Finally, if you do not feel your issue has been resolved after contacting the evaluating TA and the Head TA, then you may escalate the issue by emailing your Instructor.

Academic Integrity

The work you submit for this class must be your own work. Project phases must be the work of your group only. You may not look at other group's submissions for ideas. You may not look at past projects done for this class for ideas. The project is a design project and must be fundamentally designed from scratch by your group alone. We will be using plagiarism detection methods throughout this course. Plagiarism or any other violation of academic integrity will result in your being reported to the Office of Student Integrity.

Serve-Learn-Sustain (SLS) Affiliation

This course supports Georgia Tech's SLS Initiative when reasonably possible, 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 (https://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.