95-703: Database Management
Section A, Fall 2021

(Last Updated: October 31, 2021)

Instructor

Xiaoying Tu  xiaoying@cmu.edu
Office Hours: See Course Website.

Teaching Assistants

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Office Hours: See Course Website.

Meeting Times and Locations

Lectures: Wednesdays 06:20PM – 09:10PM @ HBH A301

All lectures are conducted in-person only.

IMPORTANT: You must only attend the classes and office hours of Section A. Do not switch to the other sections of 95-703 on an ad-hoc basis. If you are not registered for Section A, you must attend the section which you are registered for.

Classroom Expectations related to COVID-19

In order to attend class meetings in person, all students are expected to abide by all behaviors indicated in A Tartan's Responsibility, including any timely updates based on the current conditions.

In terms of specific classroom expectations, whenever the requirement to wear a facial covering is in effect on campus, students are expected to wear a facial covering throughout class. Note: the requirement to wear a facial covering is in effect for the start of the Fall 2021 semester. If you do not wear a facial covering to class, I will ask you to put one on (and if you don’t have one with you, I will direct you to a distribution location on campus, see https://www.cmu.edu/coronavirus/health-and-wellness/facial-covering.html). If you do not comply, you will be asked to leave the classroom and be referred to the Office of Community Standards and Integrity for follow up, which could include student conduct action. Finally, please note that sanitizing wipes should be available in our classroom for those who wish to use them.
Class Website

canvas.cmu.edu

Course Schedule

Please refer to the separate document titled Course Schedule (posted to Course Website) for a listing of weekly lecture topics and assignments.

Course Materials

Lecture Notes:
Lecture notes will be provided for each class. They can be used during the semester you take the class. They cannot be shared after the class is concluded without permission of the instructor.

Required Textbook:

Suggested Books:

Course Description

Database systems are central to most organizations’ information systems strategies. At any organizational level, users can expect to have frequent contact with database systems. Therefore, skill in using such systems – understanding their capabilities and limitations, knowing how to access data directly or through technical specialists, knowing how to effectively use the information such systems can provide, and skills in designing new systems and related applications – is a distinct advantage and necessity today. The Relational Database Management System (RDBMS) is one type of database systems that is most often used these days and is the primary focus of this course.
Further, to provide students with opportunity to apply the knowledge they learn from the lectures, various homework assignments, SQL assignments, and a database implementation project will be given.

Course Objectives

Upon completion of this course, you will be able to:

• Gain good understanding of relational data models in terms of data structure, data integrity, and data manipulation.
• Understand and create conceptual database models utilizing entity-relationship modeling.
• Design data structures that will limit redundancy and enforce data integrity while conforming to organizational requirements utilizing normalization methodology.
• Understand the theory behind the relational data model as it applies to interactions with current database management systems.
• Read and interpret a given data model to query the database and transform the data into information using Structured Query Language (SQL).
• Implement a data model in a current relational database management system.
• Create reports based on transactional data, including elements such as groupings & aggregating data and Analytic SQL functions.

Student Evaluation

Your work will be evaluated on a combination of the following components:

<table>
<thead>
<tr>
<th>Assessment Component</th>
<th>Grade Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homework Assignments (4)</td>
<td>20%</td>
</tr>
<tr>
<td>SQL Assignments (3)</td>
<td>20%</td>
</tr>
<tr>
<td>Project</td>
<td>25%</td>
</tr>
<tr>
<td>Final Exam</td>
<td>35%</td>
</tr>
<tr>
<td>Participation Bonus (see details below)</td>
<td>1 bonus point</td>
</tr>
</tbody>
</table>

**Homework Assignments**: The homework assignments require students to employ holistic critical thinking to design database models applying the concepts learnt in the lectures. The focus is on understanding business requirement and designing data models to capture good quality data. The range of topics covered in the assignments includes conceptual and logical database modeling, normalization, and relational algebra. The relational algebra assignment is a foundation for learning the Structured Query Language (SQL).

**SQL Assignments**: The SQL assignments are hands-on assignments that require students to create and execute various SQL statements and queries using Oracle Database Express Software that address business requirement. The submitted assignments are required to be well formatted and readable.
**Project:** Based on the logical model of a small database, the project consists of implementing the data structure, performing specific queries, data manipulation tasks, and querying system catalog to retrieve metadata. The project will integrate and apply the concepts you have learned in class. Guidelines for the project assignment will be distributed and discussed in a later part of the semester.

**Final Exam:** The exam will be a comprehensive closed book, closed notes exam. The exam is to be completed by you individually without help of any other person. The date for the exam will be decided ASAP. The exam will be graded by the instructor and the TAs.

**Participation:** You will have the opportunity to earn up to 1 additional point on your final course score through a variety of participation opportunities. These participation opportunities take the form of:

- In-person attendance to all lectures (see below for details)
- Regular participation during lectures and/or office hours, asking and/or answering questions
- Regular participation on Canvas discussion boards
- Prompt response to surveys / discussions (if any; to be announced by the instructor)

The participation bonus point may help you achieve a better letter grade if your final course score sits near the borderline between two letter grades. If after adding the participation point your course score is still below a certain threshold, I am afraid I cannot help you further boost your score.

**In-person attendance is mandatory** for all lectures. Should you encounter any extraordinary circumstance (e.g. medical reasons, schedule conflict) which prevents you from attending a session, you must notify the teaching team (via email to the instructor and all TAs) at least 12 hours in advance and receive explicit consent from one of the teaching team members in order to be exempted without penalty. **No accommodation can be granted last minute before or after the session starts.**

**“Two-strikes” Rule:** The instructor will “cold call” students at random during lectures throughout the course. 50% of the participation bonus point earned by the end of the course will be forfeited if a student is not present when cold-called once, and 100% will be forfeited if it happens twice or more.

Final letter grades are assigned according to the following scale:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>$x \geq 93$</td>
<td>Excellent</td>
</tr>
<tr>
<td>A-</td>
<td>$89 \leq x &lt; 93$</td>
<td>Very Good</td>
</tr>
<tr>
<td>B+</td>
<td>$85 \leq x &lt; 89$</td>
<td>Good</td>
</tr>
<tr>
<td>B</td>
<td>$81 \leq x &lt; 85$</td>
<td>Acceptable</td>
</tr>
<tr>
<td>B-</td>
<td>$77 \leq x &lt; 81$</td>
<td>Fair</td>
</tr>
<tr>
<td>C+</td>
<td>$73 \leq x &lt; 77$</td>
<td>Poor</td>
</tr>
<tr>
<td>C</td>
<td>$69 \leq x &lt; 73$</td>
<td>Very Poor</td>
</tr>
<tr>
<td>C-</td>
<td>$65 \leq x &lt; 69$</td>
<td>Minimal Passing</td>
</tr>
<tr>
<td>R</td>
<td>$x &lt; 65$</td>
<td>Failing</td>
</tr>
</tbody>
</table>
where \( x \) represents your final course score ranging between 0 and 100. In addition, a maximum of three students per section who topped the class and achieve a final course score of 97 or above will receive A+ for their exceptional performance.

The **average grade** in a core Heinz course is expected to be 3.33-3.4, **equivalent to a B+**. This expected average reflects the degree of difficulty and/or breadth of coverage for a core course.

We may curve the grades depending on the overall performance of the class.

**Regrade Policy**

If you believe that your grade is inaccurate, you may request a regrade under the following conditions:

- Regrade requests must be submitted within 1 week of the date when the grade was returned.
- Regrade requests must be in writing (via email to the instructor and all TAs) and must include a copy of the original submission.
- Regrade requests must specify in detail the reasons you deserve a higher grade. These will typically be that the grader misread or misunderstood your answer or did not take something into account that they should have. For this, you should use the feedback comments as your reference point. **Referencing another student’s grade is inappropriate and irrelevant.** While we do our best to apply an even standard across students, we cannot discuss anyone else’s grade with you, so we need to deal with the merits of your particular case.
- We reserve the right to regrade the entire assignment and thus **your grade may go up or down**.
- Participation points are inherently subjective and not subject to a regrade request.

**Late Submission Policy**

**No late submissions will be accepted unless you apply a late pass (see below).** If you have an extenuating circumstance (illness, accident, unexpected family matter, etc.) and have exhausted your late passes, notify the instructor and all TAs as early as possible and we will take that into consideration. **No special accommodation can be granted last minute before or after a deadline.**

You are allowed **TWO** 24-hour late passes on your HOMEWORK and SQL assignments. Each late pass can be applied on **one assignment**, which allows you to submit it up to **24 hours (1 day)** after the deadline.

**Late passes are NOT applied automatically.** You must inform the teaching team (via email to the instructor and all TAs) of applying your late pass PRIOR TO the assignment deadline. **No late pass requests will be accepted after an assignment deadline.**
Late passes are NOT APPLICABLE to assessment components other than the HOMEWORK and SQL assignments. In other words, late passes are NOT APPLICABLE to projects or exams.

Policy on Collaboration and Cheating

Unless otherwise announced by the teaching team, all the work you submit should reflect individual effort. You are encouraged to discuss the high-level concepts related to the assignment questions with fellow students (with the exception of exams), but the final work product must reflect your knowledge and effort, not your classmates’. Every line of text and line of code that you submit must be written by you personally. You may not refer to another student’s solution, or any material other than what is provided by the teaching team.

Under circumstances announced by the teaching team that collaboration is allowed, you must acknowledge in your submission any help received. That is, you must include a comment in your submission that clearly states the name of the student you collaborated with and/or the person(s) from which you received assistance.

Cheating includes but is not necessarily limited to:

1. Submission of work that is not your own for papers, assignments, lab exercises, or exams.
2. Submission or use of falsified data.
3. Theft of or unauthorized access to an exam, current or previous.
4. Use of an alternate, stand-in or proxy during an examination.
5. Use of unauthorized material including textbooks, internet material, notes, or computer programs in the preparation of an assignment or during an examination, unless otherwise indicated.
6. Supplying or communicating in any way unauthorized information to another student for the preparation of an assignment or during an examination.
7. Collaboration in the preparation of a solution to a problem unless expressly allowed by the assignment.
8. Plagiarism which includes, but is not limited to, failure to indicate the source with quotation marks or footnotes where appropriate if any of the following are reproduced in the work submitted by a student:
   a. A graphic element.
   b. A proof.
   c. A phrase, written or musical
   d. Specific language.
   e. An idea derived from the work, published or unpublished, of another person.
   f. Program code or algorithms.

If you are unsure about what is acceptable, you should consult with the instructor.
Penalties for Cheating

Penalties imposed are at the instructor’s discretion. In this class, the penalty imposed can be any of the following depending on the violation:

- zero on the assignment
- a letter reduction on final course grade (e.g., final grade of A- becomes B-)
- a failing grade in the course

Regardless of the penalty imposed, all incidents of cheating are reported to the Associate Dean. Additional penalties may be imposed.

Recording of Class

All lectures will be recorded via Zoom so that students in this course (and only students in this course) can re-watch past class sessions. This does not alleviate you from the requirement of in-person attendance. The recordings will be made available on Canvas typically by the end of the day when the lecture takes place. Please note that you are not allowed to share these recordings. This is to protect your FERPA rights and those of your fellow students.

No student may record any classroom activity without express written consent from me. If you have (or think you may have) a disability such that you need to record or tape classroom activities, you should contact the Office of Disability Resources to request an appropriate accommodation.

Disability Accommodations

If you have a disability and are registered with the Office of Disability Resources, I encourage you to use their online system to notify me of your accommodations and discuss your needs with me as early in the semester as possible. I will work with you to ensure that accommodations are provided as appropriate. If you suspect that you may have a disability and would benefit from accommodations but are not yet registered with the Office of Disability Resources, I encourage you to contact them at access@andrew.cmu.edu.

Diversity Statement

We must treat every individual with respect. We are diverse in many ways, and this diversity is fundamental to building and maintaining an equitable and inclusive campus community. Diversity can refer to multiple ways that we identify ourselves, including but not limited to race, color, national origin, language, sex, disability, age, sexual orientation, gender identity, religion, creed, ancestry, belief, veteran status, or genetic information. Each of these diverse identities, along with many others not mentioned here, shape the perspectives of our students, faculty, and staff, brings to our campus. At CMU, we will work to promote diversity, equity, and inclusion not only because diversity fuels excellence and innovation, but because we want to pursue
justice. We acknowledge our imperfections while also fully committing to the work, inside and outside of our classrooms, of building and sustaining a campus community that increasingly embraces these core values.

Resources for Diversity and Inclusion:
- Center for Diversity and Inclusion
- Intercultural Communication Center
- Office of Title IX Initiatives

Managing Stress and Obtaining Support

Take care of yourself. Do your best to maintain a healthy lifestyle this semester by eating well, exercising, avoiding drugs and alcohol, getting enough sleep, and taking some time to relax. This will help you achieve your goals and cope with stress.

If you experience any academic stress, difficult life events, or feelings like anxiety or depression, we strongly encourage you to seek support. **Consider reaching out to a friend, faculty, or family member you trust for help getting connected to the support that can help.**

On campus, Counseling and Psychological Services (CaPS) is here to help. Contact them at: 412-268-2922; or [http://www.cmu.edu/counseling/](http://www.cmu.edu/counseling/)

*If you or someone you know is feeling suicidal or in danger of self-harm, call someone immediately, day or night:*

CaPS: 412-268-2922; [http://www.cmu.edu/counseling/](http://www.cmu.edu/counseling/)
Re:solve Crisis Network: 888-796-8226

*If the situation is life threatening, call the police:*
- On campus: CMU Police: 412-268-2323
- Off campus: 911