# MIS 7373: Business Applications of Database Management Systems
## University of Houston
## Spring 2023 – ONLINE ASYNCHRONOUS
### Revision 2023.01.10

**Instructor:** Dr. Mark Grimes
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Melcher 280D

**Time:** Asynchronous

**Location:** Online

**Office Hours FtF:** Mon 11:00 - 12:00
**Office Hours Zoom:** Mon 12:00 - 1:00

- **YouTube:** http://bit.ly/ProfessorMG

- **Blackboard:** https://elearning.uh.edu

**Textbooks:**
Data Modeling and Database Design 2nd Edition
Authors: N. S. Umanath and R. W. Scamell
ISBN: 1-285-08525-6

## Course Description

Data is one of the most important assets modern businesses have. Consider Google, Uber, Facebook, AirBnB, eBay, and Alibaba - these companies do not  provide value by the physical products they provide, but rather by managing and presenting data in such a way as to provide value to users. As a future IS professional, learning to manage data is critical to your success.

In this course, we will learn about the fundamentals of data modeling, database design, and structured query language (SQL). By the end of the class you should have a solid understanding of how and why businesses use databases and the tools necessary to start designing, developing, and using databases yourself.

The topics covered in this class are divided into four parts:

1. Conceptual data modeling using entity relationship (ER) diagrams.
2. Creating relational data models based on conceptual ER models
3. Normalizing data to improve the accuracy, speed, efficiency, and robustness of a database.
4. Implementation of the relational data model using SQL to define and create a database, implement various relational algebra operations, and query multiple tables.

## Learning Objectives

Each module will have specific learning objectives to help you gauge your understanding of the material (and ensure you are prepared for the exams!). In general, by the end of this class you should be able to:

- Describe the differences between data, information, and metadata
- Create a data dictionary
- Create entity relationship diagrams and relational data models
- Infer and describe the types of data and data structures a system is using
- Describe the normal forms and transform data between first, second, and third normal form
- Compose SQL code  to create, read, update, and delete data and data structures

# Grading

The goal of this class is to develop skills that will be useful for your career in data analytics. To this end, all of the course assessments are designed to help you develop and demonstrate mastery of these skills.

| | |
|---|---|
| **60% Exams**<br><br>Two @ 30% each | Two exams, each worth 30% of your grade, will be given during the semester. Rescheduling exams will only be allowed in exceptional circumstances - please let me know as far in advance as possible if you have a conflict. If you miss an exam without prior approval no makeup opportunities will be available. Exams may consist of multiple choice, matching, short answer, essay, and diagramming questions. |
| **20% Exam Readiness Quizzes (ERQ)**<br><br>Four @ 5% each | As we complete major milestones in the course material, we will have four in-class Exam Readiness Quizzes, each worth 5% of your grade. ERQs will consist of questions directly from previous exams.<br><br>ERQs are available in the Assessments section of Blackboard<br><br>If you perform poorly on an ERQ your score from the exam immediately following the ERQ will be applied to the ERQ. |
| **10% Assignments**<br><br>Four @ 2.5% each | Four assignments, each worth 2.5% of your grade, will be collected during the semester. Some assignments will require you to think critically about the material and apply the concepts to a real world scenario, while others will be used to reinforce technical or conceptual items from the textbook and presentations. The assignments will help develop skills that will be useful in completing the SQL project and exams, while also enhancing your marketable skills. |
| **10% SQL Assignment** | The SQL project is worth 10% of your grade. SQL (Structured Query Language) is a language used by people and applications to create, query and update relational databases. The project will utilize Oracle 11g. The purpose of the SQL Experience Project is to illustrate how this powerful language can be used to create the structure of a database, populate a database, and retrieve information from a database. |

**Grade Allocations:  A:** 90-100%    **B:** 80-89%    **C:** 70-79%    **D:** 60-69%    **F:** < 60%

**If you choose to not submit assignments or exam readiness quizzes the exam immediately following the assignment/ERQ on the suggested schedule will replace the missing grade. Completing the SQL assignment is mandatory and will not be replaced by your exam grade. All assignments are due by Midnight on Friday, May 5.**

# Software

**Oracle SQL Developer:** Oracle SQL Developer is the client we will use to connect to our Oracle server for the SQL project assignment. Instructions for installing will be provided prior to the assignment.

# Suggested Schedule

This course is roughly divided into two halves, delineated by the first exam. While you can complete the lectures, ERQs, and assignments in whatever timeline you like, **the exams must be taken on the assigned dates and times**. The following suggested schedule should keep you on track.

**Note that the structure of the course does NOT go in linear order of the chapters in the book!**
**First half of class chapters: 1, 2, 3, 6, 10**
**Second half of class chapters: 11, 12, 7, 8 13**

| Week | Suggested Modules | Suggested Deliverable |
|---|---|---|
| 1<br>1/23 – 1/27 | Intro/Database Architecture<br>**Modules 1.1, 1.2, 1.3, 1.4, 1.5, 1.6** | |
| 2<br>1/30 – 2/3 | Database Concepts<br>**Modules 2.1, 2.2, 2.3, 2.4, 2.5, 2.6** | |
| 3<br>2/6 – 2/10 | Entity-Relationship Modeling<br>**Modules 3.1, 3.2** | **Submit Assignment 1**<br>**Complete ERQ 1** |
| 4<br>2/13 – 2/17 | ER Modeling and Relational Modeling<br>**Module 3.2.4, 3.3, 6.1, 6.2** | |
| 5<br>2/20 – 2/24 | Relational Data Modeling<br>**Modules 6.3, 6.4, 6.5, 6.7**<br>Review Video: **6-Data Modeling Review** | **Submit Assignment 2**<br>**Complete ERQ 2** |
| 6<br>2/27 – 3/3 | Database Creation<br>**Modules 10.1, 10.2** | |
| 7<br>3/6-3/10 | **Exam 1 – Data Modeling**<br>**Monday 3/6/2023 @ 6:00 PM** | **Exam 1 – Data Modeling**<br>**Monday 3/6/2023 @ 6:00 PM** |
| 8<br>3/13 – 3/17 | Spring Break | |
| 9<br>3/20-3/24 | Relational Algebra<br>Structured Query Language<br>**Modules 11.1, 11.2, 12.1**<br>Assignment 3 demo video: **12-A3Demo** | **Start SQL Project** |
| 10<br>3/27-3/31 | Structured Query Language<br>**Module 12.2, 12.3**<br>Review video: **12-RA and SQL Review** | **Submit Assignment 3** |
| 11<br>4/3-4/7 | Normalization<br>**Modules 7.1, 7.2, 7.3** | **Complete ERQ 3** |
| 12<br>4/10-4/14 | Normalization<br>**Modules 8.1, 8.2** | |
| 13<br>4/17-4/21 | Normalization<br>**Modules 8.3, 8.4**<br>Review Video: **8-AA/Normalization Review** | **Submit Assignment 4**<br>**Complete ERQ 4** |
| 14<br>4/24-4/28 | Advanced/Applied SQL<br>**Modules 13.1, 13.2, 13.3, 13.4, 13.5, 13.6**<br>Wrap up video | **Submit SQL Project** |
| 15<br>5/1 | **Exam 2 – SQL and Normalization**<br>**Monday 5/1/2023 @ 6:00 PM** | **Exam 2 – SQL and Normalization**<br>**Monday 5/1/2023 @ 6:00 PM** |

**Required Language for All Courses**

COVID-19 Information
Students are encouraged to visit the University's COVID-19 website for important information including diagnosis and symptom protocols, testing, vaccine information, and post-exposure guidance. Please check the website throughout the semester for updates. Consult the (select: Undergraduate Excused Absence Policy or Graduate Excused Absence Policy) for information regarding excused absences due to medical reasons.

Reasonable Academic Adjustments/Auxiliary Aids
The University of Houston complies with Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990, pertaining to the provision of reasonable academic adjustments/auxiliary aids for disabled students. In accordance with Section 504 and ADA guidelines, UH strives to provide reasonable academic adjustments/auxiliary aids to students who request and require them. If you believe that you have a disability requiring an academic adjustments/auxiliary aid, please contact the Justin Dart Jr. Student Accessibility Center (formerly the Justin Dart, Jr. Center for Students with DisABILITIES).

Excused Absence Policy
Regular class attendance, participation, and engagement in coursework are important contributors to student success. Absences may be excused as provided in the University of Houston Undergraduate Excused Absence Policy and Graduate Excused Absence Policy for reasons including: medical illness of student or close relative, death of a close family member, legal or government proceeding that a student is obligated to attend, recognized professional and educational activities where the student is presenting, and University-sponsored activity or athletic competition. Under these policies, students with excused absences will be provided with an opportunity to make up any quiz, exam or other work that contributes to the course grade or a satisfactory alternative. Please read the full policy for details regarding reasons for excused absences, the approval process, and extended absences. Additional policies address absences related to military service, religious holy days, pregnancy and related conditions, and disability.

Recording of Class
Students may not record all or part of class, livestream all or part of class, or make/distribute screen captures, without advanced written consent of the instructor. If you have or think you may have a disability such that you need to record class-related activities, please contact the Justin Dart, Jr. Student Accessibility Center. If you have an accommodation to record class-related activities, those recordings may not be shared with any other student, whether in this course or not, or with any other person or on any other platform. Classes may be recorded by the instructor. Students may use instructor's recordings for their own studying and notetaking. Instructor's recordings are not authorized to be shared with *anyone* without the prior written approval of the instructor. Failure to comply with requirements regarding recordings will result in a disciplinary referral to the Dean of Students Office and may result in disciplinary action.

Resources for Online Learning
The University of Houston is committed to student success, and provides information to

optimize the online learning experience through our Power-On website. Please visit this website for a comprehensive set of resources, tools, and tips including: obtaining access to the internet, AccessUH, Blackboard, and Canvas; using your smartphone as a webcam; and downloading Microsoft Office 365 at no cost. For questions or assistance contact UHOnline@uh.edu.

UH Email
Please check and use your Cougarnet email for communications related to this course. To access this email, login to your Microsoft 365 account with your Cougarnet credentials.

Webcams
Access to a webcam is required for students participating remotely in this course. Webcams must be turned on (*state when webcams are required to be on and the academic basis for requiring them to be on*). (*Example: Webcams must be turned on during exams to ensure the academic integrity of exam administration*.)

Academic Honesty Policy
High ethical standards are critical to the integrity of any institution, and bear directly on the ultimate value of conferred degrees. All UH community members are expected to contribute to an atmosphere of the highest possible ethical standards. Maintaining such an atmosphere requires that any instances of academic dishonesty be recognized and addressed. The UH Academic Honesty Policy is designed to handle those instances with fairness to all parties involved: the students, the instructors, and the University itself. All students and faculty of the University of Houston are responsible for being familiar with this policy.

Syllabus Changes
Due to the changing nature of the COVID-19 pandemic, please note that the instructor may need to make modifications to the course syllabus and may do so at any time. Notice of such changes will be announced as quickly as possible via Blackboard.

Helpful Information

Coogs Care: https://uh.edu/dsa/coogscare/

Student Health Center:  https://www.uh.edu/healthcenter/

# GOOD LUCK

This course is not easy!

...however, databases are a fundamental part of information systems and modern business. The skills you learn in this class will serve you well if you put in the effort to learn them!