

CS-6360.001 Database Design- Fall 2024

Course: CS-6360.001 Database Design

Instructor: Jalal Omer

Term: Fall 2023

Lecture Time: 08:30 AM- 9:45 AM Tues & Thurs.

Lecture Location: ECSS 2.311

Instructor Information

Name: Jalal Omer

Email Address: jalal.omer@utdallas.edu

Office Phone: (972) 883-2683

Office Location: ECSS 3.230

Office Hours:	Mon and Wed:	02:45 PM-03:45 PM
	Tues and Thurs:	10:00 AM – 11:00 AM

Other Information: All course content on eLearning

Prerequisites

CS-5343, Algorithm Analysis & Data Structures or equivalent

Course Description

Database Design (3 semester hours) Methods, principles, and concepts that are relevant to the practice of database software design. Database system architecture; conceptual database models; relational and object-oriented databases; database system implementation; query processing and optimization; transaction processing concepts, concurrency, and recovery; security.

Required Textbook: Fundamentals of Database Systems (7th Edition) by Ramez Elmasri, Shamkant B. Navathe, ISBN-13: 978-01339707

Referenced Book: Database System Concepts, Seventh Edition, by Avi Silberschatz, Henry F. Korth, S. Sudarshan, McGraw-Hill Book Company 2020, ISBN 9780078022159.

Student Learning Outcomes: After successful completion of this course, the student should have an:

- Understanding of conceptual, logical, and physical organization of data
- Understanding of the Relational Model and theory
- Understanding the normalization of relations
- Understanding of SQL programming
- Understanding data organization methods
- Understanding of Indexing, Query processing, Transactions
- Understanding of database integrity, concurrency, and crash recovery

My Expectations of You:

- If you feel you are struggling, please talk to me during office hours.
- Attend every class
- Ask questions during lectures, before/after class, during office hours, or e-mail me if you do not understand something.
- Read the chapter before the corresponding lecture.
- **Arrive to class on time and remain in class until dismissed.** Arriving late and leaving early cause disruptions to the other students in the class and to me. Should you need to leave early for a valid reason, please notify me in advance and sit near the door to limit the disruption.
- Students causing disruptions such as talking without permission during a lecture will be forced to leave. Disruptions include and are not limited to, talking in class, playing on your phone, and sleeping in class.
- Silence all cell phones.

What You Should Expect

- An open environment dedicated to learning. I do not take kindly to disruptive students as it makes it difficult for students to concentrate and learn the material.
- A minimum of 10 hours outside of class each week in course-related activities (e.g., reading the textbook, studying for quizzes/exams, practicing related problems)
- Challenging exams – apply the knowledge you have learned to the situations on the test. Questions on the test may not be worded exactly as you see them in the book and are designed to make sure that you understand what you are doing rather than regurgitating an example from your notes.

E-mail: The easiest way to reach me is via e-mail. I make every effort to respond within a few hours. When emailing me, please e-mail me from your UTD e-mail address. Please include your name, course, and section either in the subject or the body of your e-mail (preferably on the first line if not in the subject). This will help me to address your e-mail as quickly as possible.

Help Desk: For help with issues regarding your computer, UTD maintains a walk-in help desk. Visit their Web site for details: <http://www.utdallas.edu/ir/helpdesk/>

Grading Scale and Assignment Weight

Area	Weight
Quizzes	10%
Assignments	15%
Project	15%
Midterm Exam	30%
Final Exam (comprehensive)	30%
Total	100%

Final course grades are submitted as letter grades. The mapping of grade percentage letter grade thresholds for the overall course grade is:

%	Letter Grade	GPA Credit
≥ 94	A	4.000
[90 – 94)	A-	3.670
[87 – 90)	B+	3.330
[84 – 87)	B	3.000
[80 – 84)	B-	2.670
[77 – 80)	C+	2.330
[74 – 77)	C	2.000
< 74	F	0.000
—	NF*	0.000

* Failure for non-attendance, <https://catalog.utdallas.edu/2015/graduate/policies/grades>

How to boost your final letter Grade: I will raise the final letter to a higher letter grade for every active student in the class (for example if the final grade of an active student is 'B' it will be raised to 'B+', if it is 'A-' it will be raised to 'A', and so on).

An active student is one who attends most of the classes and (asks questions, answers questions, and/or participates in class topic discussions).

Important Notes:

1. All quizzes will be conducted OnLine using some proctoring tools such as the Lockdown browser on the announced date and time.
2. Exams (Midterm and Final) will be conducted in person (on Campus) on the announced date and time.

Grade Disputes:

All quizzes and exams will be closed books, and closed notes. Assignments and projects will be graded by a TA. Please address any grading concerns you have regarding assignments and projects with the TA. If you have a legitimate issue and are unable to resolve this issue with the TA, please talk to me during my office hours.

I am responsible for grading your exams and quizzes. If you have questions regarding your exams and quizzes grades, please talk to me during my office hours. I do not discuss grades via e-mail.

All grade disputes must be discussed/resolved within 1 week of the grade in question being posted in eLearning.

Term Project:

The project will be in several stages, and each stage will be a combination of problems, writing, and design. More descriptions of this project phases will be provided in your course eLearning shell.

Term Project Grading:

Each phase of the project has a specific percentage of the project score that is based on the importance and the work needed for each phase. Once the last phase of the project is completed, each team member will have the chance to evaluate anonymously each of his/her teammates on their performance throughout all the phases of their project.

The final scores of the whole project assign to each team member will be adjusted based his/her teammates anonymous evaluations. This means that team members in the same team (working on the same project) might get different project scores based on the scores (assigned by the instructor or by the teaching assistant) for each phase of the project and based on the final peer evaluations.

Late Assignments or Late Project: Late assignment or late project submission may be accepted with the following penalties:

- Up to 24 hours late: 10% off
- Up to 48 hours late: 25% off
- Up to 72 hours late: 50% off
- Over 72 hours late: No credit

Exams: Exams will primarily cover chapters listed below in the tentative course schedule. Students are expected to be able to apply knowledge from earlier chapters in conjunction with the tested chapters. Exams will include a variety of question types including multiple-choice, short-answer, and solving exercises. An exam should not be missed except for the most extreme circumstances (hospitalization, death of an immediate family member). A make-up exam may be given to students with a valid reason (and documentation) for missing the exam. Otherwise, the missed exam grade will be zero. The allowance of a make-up exam is at the sole discretion of the instructor.

Tentative Class Schedule - (all dates are subject to change at the discretion of the instructor)

Date	Topic	Chapters
08/20	Syllabus, Introduction to Databases	Elmasri's Book Chapters 1, 2
08/22	Introduction	Elmasri's Book Chapter 2
08/27	Entity-Relationship Model	Elmasri's Book Chapters 3, 4
08/29	Entity-Relationship Model	Elmasri's Book Chapters 3, 4
09/03	Enhanced Entity Relationship Model	Elmasri's Book Chapter 4
09/05	Relational Model	Elmasri's Book Chapter 5
09/10	Relational Model	Elmasri's Book Chapter 5
09/12	SQL Programming	Elmasri's Book Chapter 6
09/17	SQL Programming	Elmasri's Book Chapter 6
09/19	SQL Programming	Elmasri's Book Chapter 7
09/24	SQL Programming	Elmasri's Book Chapter 7
09/26	SQL Programming	Elmasri's Book Chapter 7
10/01	Relational Algebra	Elmasri's Book Chapter 8
10/03	Relational Algebra	Elmasri's Book Chapter 8
10/08	Midterm Exam	
10/10	Normalization	Elmasri's Book Chapters 14, 15
10/15	Normalization	Elmasri's Book Chapters 14, 15
10/17	Normalization	Elmasri's Book Chapters 14, 15

10/22	Normalization	Elmasri's Book Chapters 14, 15
10/24	SQL Programming (PL/SQL)	TBA
10/29	Organization, Indexing, and Processing	Elmasri's Book Chapter 17
10/31	Organization, Indexing, and Processing	Elmasri's Book Chapters 17
11/05	Algorithms for Query Processing and Optimization	Elmasri's Book Chapters 18, 19
11/07	Algorithms for Query Processing and Optimization	Elmasri's Book Chapters 18, 19
11/12	Introduction to Transaction Processing	Korth's book Chapter 17
11/14	Introduction to Transaction Processing	Elmasri's Book Chapters 20, 21
11/19	Concurrency Control Techniques	Elmasri's Book Chapters 20, 21
11/21	Concurrency Control Techniques	Elmasri's Book Chapters 20, 21
11/26	Holiday-Fall Break	
11/28	Holiday-Fall Break	
12/03	Database Recovery Techniques	Korth's book Chapter 19
12/05	Final Exam	

Communication

The best way of communication with the instructor and course TA is through email. Since classes are overcrowded, when you send an email, make sure you include your course number, section number, net-id, and full name at the end of the email message. Each student is responsible for the content/instructions of email communications. Announcements, assignments, and projects will be posted on the eLearning system. Students will turn in their assignments/projects through the eLearning portal.

Course Policies

- Assignments should be turned in no later than the deadline announced by the instructor of this class. Turn in what is completed by the deadline for partial credit.
- You should do your own work on exams, projects, and assignments. Copying another student's work is not acceptable. Any indication of cheating and/or plagiarism on an exam/assignment/project will be an automatic 0 (zero) for the exam/assignment/project for all students involved. Solutions copied from the internet, instructor's manual, etc. will be also given zero credit.
- Regular class attendance and participation are expected and are the responsibility of everyone. If a student should elect not to attend a class, (s)he is responsible for any handouts, announcements, reading material, and contents of missed lectures.
- During lectures, cell phones are not allowed. This is due to two important reasons:
 1. It potentially causes distraction, and this affects the overall quality of the lecture.
 2. Research shows student performance is adversely affected by digital device use and those students who are engaged in cell phone/laptop use receive lower final grades as compared to their peers who do not use any electronic device and take paper and pen notes.
- Once you come to class, it is not appropriate to leave the class early for any reason. If you know you must leave early for an unavoidable and important reason, make sure you sit close to the door and leave the classroom without distracting others while leaving. For the same reason, you also make sure you come to class on time.
- There will be no makeup exams unless there is a serious conflict that prevents you to take the exam on a scheduled date and time and prior notification of such a condition is required.
- If there are questions/doubts about grading, please see the grader or instructor within one week of the grade announcement.

Student Conduct & Discipline

The University of Texas System and The University of Texas at Dallas have rules and regulations for the orderly and efficient conduct of their business. It is the responsibility of each student and each student organization to be knowledgeable about the rules and regulations which govern student conduct and activities. General information on student conduct and discipline is contained in the UTD publication, *A to Z Guide*, which is provided to all registered students each academic year.

The University of Texas at Dallas administers student discipline within the procedures of recognized and established due process. Procedures are defined and described in the *Rules and Regulations, Board of Regents, The University of Texas System, Part I, Chapter VI, Section 3*, and in Title V, Rules on Student Services and Activities of the university's *Handbook of Operating Procedures*. Copies of these rules and regulations are available to students in the Office of the Dean of Students, where staff members are available to assist students in interpreting the rules and regulations (SU

1.602, 972/883-6391).

A student at the university neither loses the rights nor escapes the responsibilities of citizenship. He or she is expected to obey federal, state, and local laws as well as the Regents' Rules, university regulations, and administrative rules.

Students are subject to discipline for violating the standards of conduct whether such conduct takes place on or off campus, or whether civil or criminal penalties are also imposed for such conduct.

Academic Integrity

The faculty expects from its students a high level of responsibility and academic honesty. Because the value of an academic degree depends upon the absolute integrity of the work done by the student for that degree, it is imperative that a student demonstrate a high standard of individual honor in his or her scholastic work.

Scholastic dishonesty includes, but is not limited to, statements, acts or omissions related to applications for enrollment or the award of a degree, and/or the submission as one's own work or material that is not one's own. As a general rule, scholastic dishonesty involves one of the following acts: cheating, plagiarism, collusion, and/or falsifying academic records. Students suspected of academic dishonesty are subject to disciplinary proceedings.

Plagiarism, especially from the web, from portions of papers for other classes, and from any other source is unacceptable and will be dealt with under the university's policy on plagiarism (see general catalog for details). This course will use the resources of turnitin.com, which searches the web for possible plagiarism and is over 90% effective.

Email Use

The University of Texas at Dallas recognizes the value and efficiency of communication between faculty/staff and students through electronic mail. At the same time, email raises some issues concerning security and the identity of each individual in an email exchange. The university encourages all official student email correspondence to be sent only to a student's U.T. Dallas email address and that faculty and staff consider email from students official only if it originates from a UTD student account. This allows the university to maintain a high degree of confidence in the identity of all individuals corresponding and the security of the transmitted information. UTD furnishes each student with a free email account that is to be used in all communication with university personnel. The Department of Information Resources at U.T. Dallas provides a method for students to have their U.T. Dallas mail forwarded to other accounts.

Withdrawal from Class

The administration of this institution has set deadlines for the withdrawal of any college-level courses. These dates and times are published in that semester's course catalog. Administration procedures must be followed. It is the student's responsibility to handle withdrawal requirements from any class. In other words, I cannot drop or withdraw any students. You must do the proper paperwork to ensure that you will not receive a final grade of "F" in a course if you choose not to attend the class once you are enrolled.

Student Grievance Procedures

Procedures for student grievances are found in Title V, Rules on Student Services and Activities, of the university's *Handbook of Operating Procedures*.

In attempting to resolve any student grievance regarding grades, evaluations, or other fulfillments of academic responsibility, it is the obligation of the student first to make a serious effort to resolve the matter with the instructor, supervisor, administrator, or committee with whom the grievance originates (hereafter called "the respondent").

Individual faculty members retain primary responsibility for assigning grades and evaluations. If the matter cannot be resolved at that level, the grievance must be submitted in writing to the respondent with a copy of the respondent's School Dean. If the matter is not resolved by the written response provided by the respondent, the student may submit a written appeal to the School Dean. If the grievance is not resolved by the School Dean's decision, the student may make a written appeal to the Dean of Graduate or Undergraduate

Education and the dean will appoint and convene an Academic Appeals Panel. The decision of the Academic Appeals Panel is final. The results of the academic appeals process will be distributed to all involved parties.

Copies of these rules and regulations are available to students in the Office of the Dean of Students, where staff members are available to assist students in interpreting the rules and regulations.

Incomplete Grade Policy

As per university policy, incomplete grades will be granted only for work unavoidably missed at the semester's end and only if 70% of the coursework has been completed. An incomplete grade must be resolved within eight (8) weeks from the first day of the subsequent long semester. If the required work to complete the course and to remove the incomplete grade is not submitted by the specified deadline, the incomplete grade is changed automatically to a grade of **F**.

Disability Services

The goal of Disability Services is to provide students with disabilities educational opportunities equal to those of their-disabled peers. Disability Services is located in room 1.610 in the Student Union. Office hours are Monday and Thursday, 8:30 a.m. to 6:30 p.m.; Tuesday and Wednesday, 8:30 a.m. to 7:30 p.m.; and Friday, 8:30 a.m. to 5:30 p.m.

The contact information for the Office of Disability Services is:

The University of Texas at Dallas, SU

22 PO Box 830688

Richardson, Texas 75083-0688

(972) 883-2098 (voice or TTY)

Essentially, the law requires that colleges and universities make those reasonable adjustments necessary to eliminate discrimination on the basis of disability. For example, it may be necessary to remove classroom prohibitions against tape recorders or animals (in the case of dog guides) for students who are blind. Occasionally an assignment requirement may be substituted (for example, a research paper versus an oral presentation for a student who is hearing impaired). Classes enrolled students with mobility impairments may have to be rescheduled in accessible facilities.

The college or university may need to provide special services such as registration, note-taking, or mobility assistance.

It is the student's responsibility to notify his or her professors of the need for such an accommodation. Disability Services provides students with letters to present to faculty members to verify that the student has a disability and needs accommodations. Individuals requiring special accommodation should contact the professor after class or during office hours.

Religious Holy Days

The University of Texas at Dallas will excuse a student from class or other required activities for the travel to and observance of a religious holy day for a religion whose places of worship are exempt from property tax under Section 11.20, Tax Code, Texas Code Annotated

The student is encouraged to notify the instructor or activity sponsor as soon as possible regarding the absence, preferably in advance of the assignment. The student, so excused, will be allowed to take the exam or complete the assignment within a reasonable time after the absence: a period equal to the length of the absence, up to a maximum of one week. A student who notifies the instructor and completes any missed exam or assignment may not be penalized for the absence. A student who fails to complete the exam or assignment within the prescribed period may receive a failing grade for that exam or assignment.

If a student or an instructor disagrees about the nature of the absence [i.e., for the purpose of observing a religious holy day] or if there is a similar disagreement about whether the student has been given a reasonable time to complete any missed assignments or examinations, either the student or the instructor may request a ruling from the chief executive officer of the institution, or his or her designee. The chief executive officer or designee must take into account the legislative intent of TEC 51.911(b), and the student and instructor will abide by the decision of the chief executive officer or designee.

Off-Campus Instruction and Course Activities

Off-campus, out-of-state, and foreign instruction and activities are subject to state law and University policies and procedures regarding travel and risk-related activities. Information regarding these rules and regulations may be found at the website address given below. Additional information is available from the office of the school dean. (http://www.utdallas.edu/BusinessAffairs/Travel_Risk_Activities.htm)

These descriptions and timelines are subject to change at the discretion of the Professor.