

University of Oklahoma
School of Computer Science
CS/DSA 4513 - Database Management Systems – Section 001-Fall 2024
Time and Location: 6:00 PM - 7:20 PM (Tue, Thu) via Zoom Video Conferencing
(The Zoom meeting credentials for the lectures, the discussion hours, and the individual office hours are posted on the class website on Canvas)

Instructor: Dr. Le Gruenwald; Email: ggruenwald@ou.edu; Office Hours: 4:30 PM - 5:30 PM (Tue, Thu) via Zoom.

Teaching Assistants (TAs):

Sam Bird: Email: sam.bird@ou.edu

Ethan Haque: Email: ethan.a.haque-1@ou.edu

Diego Cifuentes Madero: Email: diego.o.cifuentes.madero-1@ou.edu

Oohasripriya Nandipati: Email: danielyowell@ou.edu

Daniel Yowell: Email: danielyowell@ou.edu

TA Office Hours via Zoom are posted on the class website on Canvas.

Use our office hours to get help with this course. There are two types of office hours: Discussion Hours and Individual Office Hours.

Discussion Hours (3 hours/week): You can join these sessions at any time during the scheduled hours. We will discuss the homework assignments and project. You can ask general questions to clarify your doubts about the descriptions of the homework assignments and project, the concepts covered in the lectures, and the requirements of the exams. As all students enrolled in this course can attend the same session at the same time, we do not want other students to see/hear your homework/project solutions or your other private matters. Therefore, during these sessions, please do not ask your private questions, such as the questions about your own solutions for a homework problem or the questions about the grade you got for an exam, and please do not share your own homework/project solutions.

Individual Office Hours (25 hours/week): You can join these sessions when we admit you. We admit one student at a time on a first-come-first-served basis. During these hours, you can ask private questions as well as general questions. You may share your own homework/project solutions with the TAs/Instructor.

Learning Management System/website

<https://canvas.ou.edu>

Course Prerequisite

(CS 2413 or CS 2414 or CS/DSA 5005) and (CS 2813 or CS/DSA 5005 or Math 2513).

Course Description

This course covers the design and implementation of a database system including data models, query languages, entity-relationship diagrams, functional dependencies, normalization, storage structures, access methods, query processing, security and transaction management, and applications. The impact of databases on individuals, organizations, and society, and legal and professional responsibilities including security and privacy will be discussed. A commercial

database management system is used to implement homework assignments and a comprehensive project.

Learning Outcomes

- Student will understand the general principles, applications, and relevant theoretical foundation of database management systems.
- Students will understand the concepts and structures necessary to design and implement a database application efficiently.
- Students will understand the impacts of databases on security and privacy.
- Students will apply the knowledge gained throughout the course to complete a comprehensive project for a practical database application. This project encompasses all phases of the database application development process, including designing, implementing, executing, and testing, utilizing a commercial database management system.

ABET Student Outcomes

This course will be evaluated for the following ABET Outcome 6: *Apply computer science theory and software development fundamentals to produce computing-based solutions.*

Texts and Materials

Abraham Silberschatz, Henry Korth, and S. Sudarshan, *Database System Concepts*, 7th Edition, McGraw-Hill, 2019.

Course Contents:

Topic	Reading
1. Introduction - Basic Concepts of DBMS	Ch.1
2. Entity-Relationship Model	Ch.6
3. Relational Model and SQL	Ch. 2, 3, 4, 5, 7
4. File Organization, Indexing, and Hashing	Ch. 10, 11
5. Formal Query Languages	Ch. 2, 27
6. Functional Dependencies and Normalization	Ch. 8
7. Application Development	Ch. 7
8. Query Processing	Ch. 15, 16
9. Information Security and Privacy	Ch. 9
10. Transaction Management and Database Recovery	Ch.17, 19

About Your Instructor

Dr. Le Gruenwald is a Professor, Dr. David W. Franke Professor, and Samuel Roberts Noble Foundation Presidential Professor in the School of Computer Science. Her teaching and research interests are in the areas of Data Management, Data Mining, Machine Learning, and Information Privacy and Security.

Expectations

Students are expected to attend classes, study the materials covered in class and textbook, follow all the announcements made in class or posted on the class website on Canvas, complete all homework and project and submit their solutions on time, and prepare and take the exams at the scheduled dates and times. For group homework, students are required to work with their group members to complete and submit their group solutions on time.

Learning Activities, Assignments, and Assessments

Assessments

A student's course grade will be computed using the student's graded group homework, graded individual homework, individual project, individual midterm exam, individual final exam, and bonus credit poll questions as follows:

Mandatory Grading Components: 100% total:

Graded Homework (Group 21% and Individual 14%)	35%
Individual Project	30%
Midterm Exam	15%
Final Exam	20%

Bonus Grading Component:

Bonus Credit Poll Questions	10%
-----------------------------	-----

Graded Homework: Each graded homework assignment will have two parts: group graded homework and individual graded homework. For the group graded homework part, you will work with your group members to answer the given questions. Your work for this part will be evaluated by both the instructor and your group members. Read the "The Grading Policy for the Group Graded Homework" posted on the class website for details. The individual graded homework part, which consists of the follow-up questions for the group graded homework part, must be answered by you only. **If you do not submit your individual graded homework part for a graded homework assignment, you will get a zero score for the entire graded homework assignment regardless of the score you got for the group graded homework part.** For you to do well on the individual graded homework part, it is important that you work with your group members to answer the questions in the group graded homework part.

Practice Homework: Practice homework will be assigned occasionally in class and will not be graded. Solutions to the practice homework will be posted on the class website. It is the students' responsibility to complete the practice homework and evaluate their solutions. Students should attempt the practice homework before reviewing the provided solutions.

Bonus Credit Poll Questions: We will set up poll questions on Zoom at appropriate time points during the lectures for you to take to get BONUS CREDIT. The poll questions given in a particular class are based on the materials discussed in that class and in the class prior to that class. The total number of bonus points of all the questions is 100 points, which is 10% of the course grade. All questions will be scored equally. If you answer a question correctly, you will get the full score for that question. If you answer a question wrongly, you will get 1/3 of the full score for that question. If you do not answer a question, you will get a zero score for that question regardless of the reasons.

Assigning Grades

The standard grade scale will be used for converting percentage grades to letter grades as follows:

- A: 90% and above
- B: 80% - 89.99%
- C: 70% - 79.99%
- D: 60% - 69.99%
- F: Below 60%

The instructor reserves the right to lower this grade scale if deemed appropriate.

Tentative Exam Dates and Times:

Midterm Exam: 6:00 PM -7:20 PM, October 24, 2024

Final Exam: 6:00 PM – 8:00 PM, December 5, 2024

Course Policies

Academic Integrity and Plagiarism

Individual Project, Graded Individual Homework, Exams, and Bonus Credit Poll Questions are individual work; they must be done by you only – no collaboration with anyone is allowed. Graded Group Homework is group work; they must be done by you and your assigned group members only – no collaboration with other groups or anyone else is allowed. The use of generative AI tools is not allowed in all homework assignments, group project components, exams, and bonus credit poll questions unless explicitly stated otherwise in the requirements of a specific homework assignment or a specific project component. These tools include ChatGPT, Bard, Bing Chat, and other AI writing and coding assistants. Violations of these rules will be considered academic misconduct and will result in action as specified in the Academic Integrity Code at OU: <http://www.ou.edu/integrity>. Consult also the following web page for a Student's Guide to Academic Integrity at OU: <http://www.ou.edu/integrity/students>.

Make-up Policy

There are no makeup assignments for homework or project or exams or bonus credit poll questions. In the event of a missed midterm exam due to emergencies and with prior approval from the instructor, the percentage equivalent of the missed midterm exam will be incorporated into the final exam grade.

Absences

You are expected to attend classes. You are responsible for all the material covered in class and in the textbook, and any announcements made in class or posted on the class website on Canvas. If you are absent from a class when a bonus credit poll question is given, you will receive zero credit for that question, regardless of the reason for your absence.

Technology

Java, JDBC, and a commercial database management system, such as the Microsoft Azure SQL Database, will be used to implement and execute database applications for the homework assignments and project.

Group/Lab Partner Work Policies

Read the “The Grading Policy for the Group Graded Homework” posted on the course website.

University Policies

Copyright Syllabus Statement

Sessions of this course may be recorded or live-streamed. These recordings are the intellectual property of the individual faculty member and may not be shared or reproduced without the explicit, written consent of the faculty member. In addition, privacy rights of others such as students, guest lecturers, and providers of copyrighted material displayed in the recording may be of concern. Students may not share any course recordings with individuals not enrolled in the class or upload them to any other online environment.

Academic Integrity

Academic honesty is incredibly important within this course. Cheating is strictly prohibited at the University of Oklahoma because it devalues the degree you are working hard to get. As a member of the OU community, it is your responsibility to protect your educational investment by knowing and following the rules. For specific definitions on what constitutes cheating, review the Student’s Guide to Academic Integrity at OU: <http://www.ou.edu/integrity/students>.

To be successful in this class, all work on Exams, Individual Graded Homework, Individual Project, and Bonus Credit Poll Questions, must be yours and yours alone. You may not receive outside help on assessments. Graded Group Homework is group work; they must be done by you and your assigned group members only – no collaboration with other groups or anyone else is allowed. The use of generative AI tools is not allowed in all homework assignments, group project components, exams, and bonus credit poll questions unless explicitly stated otherwise in the requirements of a specific homework assignment or a specific project component. These tools include ChatGPT, Bard, Bing Chat, and other AI writing and coding assistants. Violations of these rules will be considered academic misconduct and will result in action as specified in the Academic Integrity Code at OU: <http://www.ou.edu/integrity>. Consult also the following web page for a Student's Guide to Academic Integrity at OU: <http://www.ou.edu/integrity/students>.

Religious Observance

It is the policy of the University to excuse the absences of students that result from religious observances and to reschedule examinations and additional required

classwork that may fall on religious holidays, without penalty. [\[See Faculty Handbook 3.15.2\]](#)

Reasonable Accommodation Policy

The Accessibility and Disability Resource Center is committed to supporting students with disabilities to ensure that they are able to enjoy equal access to all components of their education. This includes your academics, housing, and community events. If you are experiencing a disability, a mental/medical health condition that has a significant impact on one or more life functions, you can receive accommodations to provide equal access. Possible disabilities include, but are not limited to, learning disabilities, AD(H)D, mental health, and chronic health. Additionally, we support students with temporary medical conditions (broken wrist, shoulder surgery, etc.) and pregnancy. To discuss potential accommodations, please contact the ADRC at 730 College Avenue, (ph.) 405.325.3852, or adrc@ou.edu.

Title IX Resources and Reporting Requirement

Anyone who has been impacted by gender-based violence, including dating violence, domestic violence, stalking, harassment, and sexual assault, deserves access to resources so that they are supported personally and academically. The University of Oklahoma is committed to offering resources to those impacted, including: speaking with someone confidentially about your options, medical attention, counseling, reporting, academic support, and safety plans. If you would like to speak with someone confidentially, please contact [OU Advocates](#) (available 24/7 at 405-615-0013) or another confidential resource (see [“Can I make an anonymous report?”](#)). You may also choose to report gender-based violence and discrimination through other means, including by contacting the [Institutional Equity Office](#) (ieo@ou.edu, 405-325-3546) or police (911). Because the University of Oklahoma is committed to the safety of you and other students, I, as well as other faculty, Graduate Assistants, and Teaching Assistants, are mandatory reporters. This means that we are obligated to report gender-based violence that has been disclosed to us to the Institutional Equity Office. This includes disclosures that occur in: class discussion, writing assignments, discussion boards, emails and during Student/Office Hours. For more information, please visit the [Institutional Equity Office](#).

Adjustments for Pregnancy/Childbirth Related Issues

Should you need modifications or adjustments to your course requirements because of documented pregnancy-related or childbirth-related issues, please contact your professor or the Accessibility and Disability Resource Center at 405/325-3852 as soon as possible. Also, see the Institutional Equity Office [FAQ on Pregnant and Parenting Students' Rights](#) for answers to commonly asked questions.

Emergency Protocol

During an emergency, there are official university [procedures](#) that will maximize your safety.

Severe Weather: If you receive an OU Alert to seek refuge or hear a tornado siren that signals severe weather.

1. Look for severe weather refuge location maps located inside most OU buildings near the entrances
2. Seek refuge inside a building. Do not leave one building to seek shelter in another building that you deem safer. If outside, get into the nearest building.
3. Go to the building's severe weather refuge location. If you do not know where that is, go to the lowest level possible and seek refuge in an innermost room. Avoid outside doors and windows.
4. Get in, Get Down, Cover Up
5. Wait for official notice to resume normal activities.

Additional [Weather Safety Information](#) is available through the Department of Campus Safety.

Armed Subject/Campus Intruder

If you receive an OU Alert to shelter-in-place due to an active shooter or armed intruder situation or you hear what you perceive to be gunshots:

1. *Avoid*: If you believe you can get out of the area WITHOUT encountering the armed individual, move quickly towards the nearest building exit, move away from the building, and call 911.
2. *Deny*: If you cannot flee, move to an area that can be locked or barricaded, turn off lights, silence devices, spread out, and formulate a plan of attack if the shooter enters the room.
3. *Defend*: As a last resort fight to defend yourself.

For more information, visit [OU's Active Shooter page](#).

[Shots Fired on Campus Procedure – Video](#)

Fire Alarm/General Emergency

If you receive an OU Alert that there is danger inside or near the building, or the fire alarm inside the building activates: 1. *LEAVE* the building. Do not use the elevators. 2. *KNOW* at least two building exits 3. *ASSIST* those that may need help 4. *PROCEED* to the emergency assembly area 5 *ONCE safely outside, NOTIFY first responders of anyone that may still be inside building due to mobility issues.* 6. *WAIT* for official notice before attempting to re-enter the building.

[OU Fire Safety on Campus](#)

Mental Health Support Services

If you are experiencing any mental health issues that are impacting your academic performance, counseling is available at the University Counseling Center (UCC). The Center is located on the second floor of the Goddard Health Center, at 620 Elm Rm. 201, Norman, OK 73019. To schedule an appointment call (405) 325-2911. For more information, please visit [University Counseling Center](#).

Students are responsible for any changes/additions to this syllabus announced over the course of the semester.