DATABASE MANAGEMENT

BUSA 526, Section # 81840 (W 3:30-6:10 pm, 839)

COURSE SYLLABUS: Fall 2025

INSTRUCTOR INFORMATION

Instructor: Anil Kumar
Office Location: Dallas 2058, Commerce BA 211
Office Hours: TR 11:00 am – 12:30 pm (Commerce) and W 1:10-3:10 pm (Dallas and online) and by appointment
University Email Address: anil.kumar@etamu.edu
Preferred Form of Communication**:** email
Communication Response Time: within 24 hours

COURSE INFORMATION

Textbook(s) Required: None. Links to all readings for the course will be made available on D2L.
Software Required: MySQL Workbench will be utilized as the database tool in this course. Students will be provided links in D2L for downloading the tool.

Optional Texts and/or Materials: SQL Queries for Mere Mortals: A Hands-On Guide to Data Manipulation in SQL (3rd Edition) by Viescas, Hernandez ISBN: 978-0321992475

Bulletin Description

This course provides a foundation for the design, implementation, and management of database systems. Students will study both design and implementation issues with an emphasis on database management issues.

Student Learning Outcomes

At the end of this course students will be able to:

1. **Analyze and Evaluate Data Ecosystems:** Understand and critically evaluate the role of data within organizational data ecosystems, including the rationale for database management, create and analyze data models, and the importance of data normalization.
2. **Design and Implement Relational Databases:** Design robust and efficient relational database schemas using ERDs and normalization principles, and implement these designs using SQL, ensuring data integrity, consistency, and efficient retrieval.
3. **Optimize, Secure, and Explore Advanced Database Concepts:** Apply advanced database management techniques (including performance tuning, security, backup/recovery, data warehousing, and big data) and investigate emerging database technologies (such as NoSQL and open-source intelligence databases) to address complex data challenges.
4. **Leverage AI for Database Management:** Effectively utilize AI tools as learning companions to enhance understanding, problem-solving, and practical application of database management concepts, and critically reflect on the impact of AI on database management practices.

COURSE REQUIREMENTS

Minimal Technical Skills Needed

Students are expected to be proficient in D2L and the MS-Office suite. Students are expected to submit their assignments using MS-Office tools via D2L, where all course materials will be accessible.

Instructional Methods

The course employs a combination of brief lectures and hands-on activities to enhance your comprehension and application of database management concepts. We analyze data requirements for organizations using real-world events from the past five years, and peer learning as an instruction method is actively encouraged through several mini projects.

Student Responsibilities or Tips for Success in the Course

I strongly encourage you to create a schedule for your learning in the course. Each one of you has a life outside of this course and the schedule will help you manage your time without being overwhelmed.

Teamwork is crucial for academic and professional success. Engaging with classmates can enhance your learning experience. Don’t hesitate to ask questions and seek guidance when needed. Communicate, clearly and timely, to ensure that roles in your team are well defined, deadlines are set, and expectations are realistic.

Login into D2L on a regular basis to make sure that you have the latest information about the course.

I am there to help you succeed in your learning journey. Email me when you are challenged by course materials, and I'll help you. All emails will be answered within 24 hours.
.

GRADING

Final grades in this course will be based on the following scale:

A = 90%-100%
B = 80%-89%
C = 70%-79%
D = 60%-69%
F = 59% or Below

Total points corresponding to the final letter grades

A = 450 - 500 Points	Data strategist
B = 400 - 449 Points	Data administrator
C = 350 - 399 Points	Data professional
D = 300 - 349 Points	Data analyst/consultant
F = < 300 Points	Needs training

Weights of the assessments in the calculation of the final letter grade.
Example:

Assignments	45%
Mini projects	55%
TOTAL	100%

Assessments

Weekly Assignments
Every other week students will complete either a reflective journal or a real-world problem situation or a combination of both. The former will help you reflect on your learnings and share insights gained while the latter will help you demonstrate your understanding by applying concepts to propose practical solutions.

Mini-Projects
Throughout this course, you'll complete a series of mini projects designed to help you apply what you've learned to practical scenarios. These projects are cumulative, with each building on the last. You'll start by acting as a consultant to model a database for an organization. Next, you'll take on the role of a junior data professional to build and query that database on your own computer. In the third mini project, you'll become a data administrator, enhancing the database's performance, security and backup. Finally, you'll act as a data strategist, creating a professional

brief for senior management to analyze a future data trend. These projects will challenge you to think critically, use AI as a tool, and demonstrate your growing expertise in database management.

Submit all assignments and mini projects via D2L by the specified deadline. Late submissions will incur a 25% deduction for each day beyond the due date. For example, if a submission is late by two days, then 50% will be deducted. All submissions will be graded and posted on D2L within **10** business days.

COURSE OUTLINE / CALENDAR

This is a tentative schedule and is subject to change at the instructor's discretion. All changes will be communicated to the students.

A classroom is a place to meet and discuss ideas. As you read the assigned materials, you should ask yourself, "What does this reading tell you about database management? How can you relate it to what you know about database management? How does it add to your professional growth? Do you agree with the author(s)? If not, why not? What do you foresee happening in the future? Discussions outside of class are very useful and I encourage you to form study groups. While I am there to guide you through the learning process, it is one where each one of you travels on her/his own with the help of your peers.

Content

Core concepts (30%) Applications (50%) Emerging Tech (20%)

Levels

Introductory (50%) Specialized (30%) Advanced (20%)

Week 1: Introduction to Database Management

- **Lecture Topics**: Course logistics, overview of data and database management, and the data journey.
- **Assignments**: Self introduction (10 pts) and data value (25 pts) story (due end of 1st week).
- **Activities**: Exploring and understanding the significance of data and database management within organizations and society through a systems thinking perspective.
- **AI Tools to explore**: ChatGPT, Gemini, and Notebook LLM.

Week 2: The Initiation of the Data Journey – Conceptual and Logical Models

- **Lecture Topics**: Data modeling concepts, Entity-Relationship (ER) diagrams.

- **Assignments**: ERD design and AI reflection (40 pts) due end of Week 2.
- **Activities**: Creating ER diagrams sessions.
- **AI Tools to explore**: Lucidchart (AI features) and Miro.

Week 3: Relational Databases and Normalization

- **Lecture Topics**: Introduction to relational databases, normalization (1NF, 2NF, 3NF).
- **Assignments**: No assignments for this week.
- **Activities**: Sessions on normalizing a sample database.
- **AI Tools to explore**: ChatGPT, Gemini, and Notebook LLM.

Week 4: Mini-project #1 - Data modeling for a real-world scenario

- You've spent the past few weeks understanding the value of well-organized data, learning how to visually model it with ERDs, and applying the rules of normalization to ensure its integrity. Now, it's time to put those foundational skills to work. This week's mini project is your chance to show that you can translate a real-world problem into a solid data model. (50 pts)

Week 5: SQL – Basic queries and MySQL setup

- **Lecture Topics**: SQL syntax, basic queries.
- **Assignments**: No assignments for this week.
- **Activities**: Sessions on installing MySQL, writing basic SQL queries.
- **AI Tools to explore**: ChatGPT and Google Gemini.

Week 6: SQL – Digging deeper with SQL

- **Lecture Topics**: Intermediate and advanced SQL queries, importing data into MySQL.
- **Assignments**: SQL queries using MySQL and AI reflection in understanding complex logic (50 pts, due end of Week 6).
- **Activities**: Session on advanced SQL queries.
- **AI Tools to explore**: ChatGPT, Google Gemini, GitHub Copilot and Tabnine.

Week 7: Database Design and Schema Creation

- **Lecture Topics**: Database schema design, best practices.
- **Assignments**: No assignments for this week.
- **Activities**: Session on creating database and importing data.
- **AI Tools to explore**: ChatGPT, Google Gemini, GitHub Copilot and Tabnine.

Week 8: Mini-project #2 - Database design for a real-world scenario

- This mini project is your chance to build a real database from scratch. Drawing on your work in Modules 1 and 2, you'll find a small dataset (800-1000 records) for which you will define and answer a set of business questions. Your task is to act as a junior data professional: you'll first write the SQL script to create a normalized, well-structured database schema. Then, you'll load the provided data into your new tables. Finally, you'll write a series of SQL queries to answer the business questions. This project will test your ability to translate a business need into a functional database and analyze data using the SQL skills you've developed. (75 pts)

Week 9: Database Management - Performance Tuning

- **Lecture Topics**: Database management, indexing, query optimization, and tuning.
- **Assignments**: No assignments for this week.
- **Activities**: Session on database performance tuning.
- **AI Tools to explore**: ChatGPT, Google Gemini, GitHub Copilot and Tabnine.

Week 10: Database Management - Security

- **Lecture Topics**: Database security best practices and understanding the role of AI in protecting organizational data.
- **Assignments**: Proposing a database security plan (50 pts, due end of week 10).
- **Activities**: Session on database security plan.
- **AI Tools to explore**: ChatGPT and Google Gemini.

Week 11: Database Management - Backup

- **Lecture Topics**: Database backup best practices and understanding the role of AI in optimizing backup for an organization.
- **Assignments**: No assignments for this week.
- **Activities**: Session on database backups and recovery.
- **AI Tools to explore**: ChatGPT and Google Gemini.

Week 12: Mini-project #3 - Enhancing digital inventory

- Now that you've built a database, your next task is to improve it. For this mini project, you'll revisit the database you created for the Module 2 mini-project. You will act as a data administrator, focusing on management and integrity. Your job is to first refine your database's design by ensuring it is properly normalized and includes key constraints to prevent bad data. You will then propose a simple backup and recovery plan to protect against data loss. This mini project will challenge you to think beyond creation and consider the long-term health and reliability of a database. (75 pts)

Week 13: Beyond the basics – Data warehousing and big data

- **Lecture Topics**: Data warehousing, big data concepts and technologies.
- **Assignments**: No assignments for this week.
- **Activities**: Discussion on big data and its implications in database management.
- **AI Tools to explore**: ChatGPT and Google Gemini.

Week 14: Beyond the basics – NoSQL Databases

- **Lecture Topics**: Introduction to NoSQL databases, types, and use cases.
- **Assignments**: Comparison of Relational and NoSQL databases (50 pts, due end of week 14).
- **Activities**: Discussion on NoSQL technologies and applications.
- **AI tools to explore**: ChatGPT and Google Gemini.

Week 15: Beyond the basics – OSINT and AI in the data world

- **Lecture Topics**: Introduction to OSINT and AI for creating value from data.
- **Assignments**: No assignments for this week.
- **Activities**: exploring how a business could use AI and OSINT to answer customer questions by querying a database with natural language.
- **AI tools to explore**: ChatGPT and Google Gemini.

Week 16: Mini-project #4 - The future of data

- This is your final and capstone mini project, where you will act as a data strategist. You'll choose one of the emerging data technologies (OSINT or AI) discussed in Module 4 and write a professional brief for senior management. In this culminating assignment, you will assume the role of a Strategic Data Strategist to design a resilient, secure, and scalable database system that supports the integration of an emerging technology such as AI or OSINT. Through applied schema design, SQL development, performance tuning, and security planning, you will synthesize course concepts into a real-world organizational scenario. The final deliverable is a professional-grade architecture brief that showcases your technical expertise and strategic insight. It will test your research, analytical, and communication skills, challenging you to synthesize complex concepts and present them in a clear, compelling, and forward-thinking format suitable for both technical and non-technical audiences. (75 points)

TECHNOLOGY REQUIREMENTS

LMS

All course sections offered by East Texas A&M University have a corresponding course shell in the myLeo Online Learning Management System (LMS). Below are technical requirements

LMS Requirements:
https://community.brightspace.com/s/article/Brightspace-Platform-Requirements

LMS Browser Support:
https://documentation.brightspace.com/EN/brightspace/requirements/all/browser_support.htm

Zoom Video Conferencing Tool
https://inside.tamuc.edu/campuslife/CampusServices/CITESupportCenter/Zoom_Account.aspx?source=universalmenu

ACCESS AND NAVIGATION

You will need your campus-wide ID (CWID) and password to log into the course. If you do not know your CWID or have forgotten your password, contact the Center for IT Excellence (CITE) at 903.468.6000 or helpdesk@tamuc.edu**.**

Note: Personal computer and internet connection problems do not excuse the requirement to complete all course work in a timely and satisfactory manner. Each student needs to have a backup method to deal with these inevitable problems. These methods might include the availability of a backup PC at home or work, the temporary use of a computer at a friend's home, the local library, office service companies, Starbucks, a TAMUC campus open computer lab, etc.

COMMUNICATION AND SUPPORT

If you have any questions or are having difficulties with the course material, please contact your instructor.

Technical Support

If you are having technical difficulty with any part of Brightspace, please contact Brightspace Technical Support at 1-877-325-7778. Other support options can be found here:

https://community.brightspace.com/support/s/contactsupport

Interaction with Instructor Statement

All emails will be returned within 24 hours. Please make sure to include the course number and section in the email subject.

COURSE AND UNIVERSITY PROCEDURES/POLICIES

Course Specific Procedures/Policies

Students are required to meet the expectations listed below.

- Professional Behavior: It is important that you always maintain a professional demeanor, including during "electronic communication". ETAMU expects this from you, as do current and future employers. In discussing concepts and ideas we need to respect viewpoints, even when we disagree.
- Regular and Timely Participation: You are expected to read all course materials and be prepared to engage in the learning process.
- Assignments:
    - Submitted assignments must be correctly formatted and free of grammatical and stylistic errors. Students in BUSA 526 should be proficient with software for word processing, spreadsheets, databases, graphics, and presentations, and with web browsers and search engines. Spelling and grammatical errors will detract from grade!
    - Assignments must be submitted on time. Assignments are due at the date and time listed. Start working on each assignment as soon as you possibly can so that you can ask questions in a timely manner if needed. If you do not submit assignments on time, you will lose 25% of the grade per day late.
    - Assignments must be complete. You must complete and submit assignments at the specified due date and time to receive credit for the assignment. Please don't submit work that is only "half-finished".
    - Please submit all assignments in a format that is compatible with Microsoft Office. Save all documents as doc or docx files. Do not submit assignments as PDF documents.
    - Back-ups are required: You are required to back up all your assignments on a disk that can be submitted to me upon my request. If work is lost due to insufficient back-up, you will not have the opportunity to recreate and submit later.
- Good communication skills are a requirement of all management professionals. Company recruiters consider these skills critical. Therefore, 10% of the grade of any submitted paper or report will be based on its quality. Quality refers to following the required format, order, and layout of the submission, the inclusion of graphs and charts where appropriate, and the use of correct grammar, spelling, and punctuation. Keep professionalism in mind. Submit your work in the same way you would to your manager in the business world. All submissions are to be typed using Times New Roman, font size 12 and single spaced. Plagiarism will result in an automatic fail.
- E-mail: All communication for students will be posted as an announcement (and email) on D2L. Therefore, students must routinely check e-mail sent to your respective ETAMU email accounts.

- Make-up or late assignments will only be accepted if you obtain university approved documentation for your excuse. There are no make-up assignments for poor performance on a previous assignment.
- Changes to schedule: While I plan to stick to the class schedule, there may be occasions to modify the schedule. In these cases, all changes will be posted as a D2L announcement and an e-mail to your ETAMU account. It is your responsibility to become aware of any such changes.

Syllabus Change Policy

The syllabus is a guide. Circumstances and events, such as student progress, may make it necessary for the instructor to modify the syllabus during the semester. Any changes made to the syllabus will be announced in advance.

University Specific Procedures

Student Conduct

All students enrolled at the University shall follow the tenets of common decency and acceptable behavior conducive to a positive learning environment. The Code of Student Conduct is described in detail in the Student Guidebook.
http://www.tamuc.edu/Admissions/oneStopShop/undergraduateAdmissions/studentGuidebook.aspx

Students should also consult the Rules of Netiquette for more information regarding how to interact with students in an online forum: https://www.britannica.com/topic/netiquette

ETAMU Attendance

For more information about the attendance policy please visit the Attendance webpage and Procedures 13.99.99.R0.01
http://www.tamuc.edu/admissions/registrar/generalInformation/attendance.aspx

Academic Integrity

Students at East Texas A&M University are expected to maintain high standards of integrity and honesty in all of their scholastic work. For more details and the definition of academic dishonesty see the following procedures:

Undergraduate Academic Dishonesty 13.99.99.R0.03
Undergraduate Student Academic Dishonesty Form

http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/documents/13.99.99.R0.03UndergraduateStudentAcademicDishonestyForm.pdf

Graduate Student Academic Dishonesty Form

https://inside.tamuc.edu/academics/graduateschool/faculty/GraduateStudentAcademicDishonestyForm.pdf

Students with Disabilities-- ADA Statement

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you have a disability requiring an accommodation, please contact:

Office of Student Disability Resources and Services
East Texas A&M University
Velma K. Waters Library Rm 162
Phone (903) 886-5150 or (903) 886-5835
Fax (903) 468-8148
Email: studentdisabilityservices@tamuc.edu
Website: Office of Student Disability Resources and Services

Nondiscrimination Notice

East Texas A&M University will comply in the classroom, and in online courses, with all federal and state laws prohibiting discrimination and related retaliation on the basis of race, color, religion, sex, national origin, disability, age, genetic information or veteran status. Further, an environment free from discrimination on the basis of sexual orientation, gender identity, or gender expression will be maintained.

Campus Concealed Carry Statement

Texas Senate Bill - 11 (Government Code 411.2031, et al.) authorizes the carrying of a concealed handgun in East Texas A&M University buildings only by persons who have been issued and are in possession of a Texas License to Carry a Handgun. Qualified law enforcement officers or those who are otherwise authorized to carry a concealed handgun in the State of Texas are also permitted to do so. Pursuant to Penal Code (PC) 46.035 and ETAMU Rule 34.06.02.R1, license holders may not carry a concealed handgun in restricted locations.

For a list of locations, please refer to the Carrying Concealed Handguns On Campus document and/or consult your event organizer.

Web url:
http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/34SafetyOfEmployeesAndStudents/34.06.02.R1.pdf

Pursuant to PC 46.035, the open carrying of handguns is prohibited on all ETAMU campuses. Report violations to the University Police Department at 903-886-5868 or 9-1-1.

ETAMU Supports Students' Mental Health

The Counseling Center at ETAMU, located in the Halladay Building, Room 203, offers counseling services, educational programming, and connection to community resources for students. Students have 24/7 access to the Counseling Center's crisis assessment services by calling 903-886-5145. For more information regarding Counseling Center events and confidential services, please visit **www.tamuc.edu/counsel**

AI use policy [Draft 2, May 25, 2023]

East Texas A&M University acknowledges that there are legitimate uses of Artificial Intelligence, ChatBots, or other software that has the capacity to generate text, or suggest replacements for text beyond individual words, as determined by the instructor of the course.

Any use of such software must be documented. Any undocumented use of such software constitutes an instance of academic dishonesty (plagiarism).

Individual instructors may disallow entirely the use of such software for individual assignments or for the entire course. Students should be aware of such requirements and follow their instructors 'guidelines. If no instructions are provided the student should assume that the use of such software is disallowed.

In any case, students are fully responsible for the content of any assignment they submit, regardless of whether they used an AI, in any way. This specifically includes cases in which the AI plagiarized another text or misrepresented sources.

13.99.99.R0.03 Undergraduate Academic Dishonesty

13.99.99.R0.10 Graduate Student Academic Dishonesty

BUSA 526 AI use course policy:

As your professor, I advocate for the use of AI tools like ChatGPT, Gemini etc. to enrich your learning journey, boost productivity, and advance your career. AI can be an invaluable asset for idea generation, research, and honing analytical skills. However, it's essential to use these tools responsibly and ethically to preserve the integrity of your work and adhere to academic standards.

Acceptable Use of AI:

1. **Research and Idea Generation:** Use AI to help brainstorm topics, generate ideas, and gather preliminary information.
2. **Improving Writing:** Use AI for proofreading to enhance the clarity, grammar, and structure of your writing.

3. **Personalized Learning:** Engage with AI to improve your understanding of course material and develop relevant skills, such as prompt engineering and queries etc.

Unacceptable Use of AI:

1. **Plagiarism:** Presenting AI-generated content as your own without appropriate attribution is strictly forbidden. All submissions must be original and demonstrate your personal understanding and effort.

2. **Cheating:** Using AI to complete assignments, quizzes, or exams, undermining the learning process, is not allowed.

3. **Fabrication of Data:** Generating or altering data using AI tools to misrepresent research findings or results is unacceptable.

4. **Misrepresentation:** Presenting AI-generated content or ideas your own is prohibited.

Guidelines for Responsible Use:

1. **Cite AI Sources:** If you use AI tools to gather information or generate content, provide appropriate citations and acknowledge the use of these tools in your work.

2. **Maintain Academic Integrity:** Ensure that your submissions reflect your own understanding, analysis, and synthesis of the material. Use AI as a supplement, not a substitute, for your learning and effort.

3. **Transparency:** Be honest about the extent to which AI has assisted you in your work. When in doubt, consult with the instructor on how to appropriately integrate AI into your assignments.

4. **Learn and Grow:** Use AI as a learning tool to enhance your knowledge and skills. Strive to understand and internalize the concepts rather than relying solely on AI outputs.

Consequences of Misuse: Violations of this AI policy will be treated as academic misconduct and will be subject to the university's academic integrity procedures. Penalties may include failing the assignment, failing the course, or further disciplinary action as outlined in the university's academic integrity policy.

By adhering to these guidelines, you can effectively harness the power of AI to support your educational journey while maintaining the highest standards of academic integrity and professionalism.

The course AI Policy developed by Dr. Greg Lubiani was adapted for this course.

Department or Accrediting Agency Required Content