

SYLLABUS

BCIS 5420-003: Foundations of Database Management Systems Spring 2024

Instructor: Dipakkumar P Pravin, PhD, **Office:** BLB 357-B
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Class Session Zoom: Online, each Tuesday 11:00AM to 1:50PM CST

Zoom Meeting ID: 890 9562 7019 **Password:** 5420

Zoom-URL:

<https://unt.zoom.us/j/89095627019?pwd=QzN3TDk5MlpKT2NPOENST0NQZ1VnUTO9>.

Zoom Office hours: Wednesday @ 2:00 PM to 3:00PM CST (or by appt)

Zoom Meeting ID: 550 363 5876 **Password:** 14221

Zoom-URL

<https://unt.zoom.us/j/5503635876?pwd=SXRPZ3JVZWFabk92NXptYW83UHY4dz09>

TA NAMES, HOURS & ZOOM:

- **TA: Office Hours Thursday 4pm to 6pm (in CST, over Zoom)**
 - Ibrahim Ali Khan
- **TA: Zoom meeting ID: 909 360 3043**
- **Zoom link :** <https://unt.zoom.us/j/9093603043>
- **NOTE:** Please do **NOT** send emails to TAs, post your questions on the Course Discussion board [here](#).
- All grading issues should be sent to Prof Pravin who may ask one of the TAs to discuss further with you.

COMMUNICATION PREFERENCES:

1. Use (ONLY) discussion board on Canvas for all course related questions!
2. Use Email, ONLY for specific personal/confidential questions, please use subject line prefix **S24-5420-003** <your topic> ; where 058 is the class section.
3. Text ONLY for urgent situations (personal cell number on Canvas): Start Text with: "S23-5420-00x": your name. Incomplete texts will not be responded to. Where 00x should be your specific class section.
4. Call (personal cell number on Canvas) in case of a real emergency!
5. Please DO NOT SEND ME WhatsApp, Signal, Discord, GroupME, **Teams**, Messenger, or ANY social media messages.
6. Please DO NOT use Canvas Inbox.
7. Please review communication guidelines at Online Communication Tips (<https://clear.unt.edu/online-communication-tips>)

COURSE DESCRIPTION

This course is an introduction to database and database management systems technology within the framework of a business environment. Topics include the study of analysis, design, development, and implementation of databases in business applications.

Why is this course important? Information systems have been the central nervous systems of any organization since forever—technologies come and go, but the data/information remains. Data is what flows through an organization (in fact, any organization) and the repository of all that data is the database systems. This course covers the entire lifecycle of data:

- how do the data originate?
- how should the data be structured?
- How do the data move around?
- how to Create, Read, Update and Delete them—this is the CRUD of it all!

Course Learning Objectives

This course is an introduction to database design in a corporate environment. Its primary focus is on the technical and management issues of database technology and its use. The student will analyze, design, develop, and implement a database-oriented business application. Upon completion of the course, the student should be able to define, structure, create, load, and manipulate a database supporting some workflow in an organization.

By the end of this course, students will be able to:

1. Model various business workflows using entity-relationship diagrams (ERD).
2. Use SQL (Structured Query Language) to design and implement ER diagrams into an actual relational database.
3. Use SQL to query data.
4. Understand why we need NoSQL databases and how to use them.
5. Understand what “big data” is and why we need to deal with it.
6. What are "Regular Expressions"? And where do we use them?

The course structure will emphasize various topics as follows:

1. (10%) What is a Database and why should businesses bother with it? It is crucial to understand this concept and it will be talked throughout the course.
2. (10%) Hands-on: How to design a database and its nitty-gritty? This is making of ERDs, what does a "business rule" (or a business process) has to do with the ERDs etc.
3. (5%) What are different database types and why they are needed? There will be more focus on SQL and document DBs, but we will learn briefly about the other database types.
4. (60%) Hands-on Learning SQL: Oracle(10%) and MS-SQL (50%). Being able to read and write SQL queries is the most important take away from this course. Further, one needs to know that different tools and language variations exist, and these factors can have serious implications in running a business.
5. (10%) Hands-on Document DBs: Specifically, MongoDB. One needs to be able to install database software tools on their own machine and work with them.
6. (5%) Hands-on: Regular Expressions. Regular Expressions are "queries" that helps one find specific patterns in the data.

PREREQUISITES

Considering this being a core course for most master's students, the MOST IMPORTANT prerequisites are the *ability to reason, get work done on time, and ask questions*. Did we mention that ability to *ask questions* is a prerequisite? If not, here it is again: "*ability to ask questions is a prerequisite*". Please do develop, borrow, buy, steal, learn to pretend, or somehow acquire a habit to *ask questions*!

If you are new to the databases, or just want a refresher then check out this course *on Linked-in Learning*, it is free for UNT Students. This is a HIGHLY RECOMMEND short course to all

students. It is about 90 minutes long, but if you are new to databases expect it to take about 3-8 hours for you--that time will be worth spending.

Linked-in Learning Course Title: From Excel to SQL

Course Author: James Parkin

Course URL: https://www.linkedin.com/learning/from-excel-to-sql?trk=learning-serp_learning-search-card_search-card&upsellOrderOrigin=default_guest_learning

NOTE: You must log in on linked-in Learning with your UNT credentials and it will be free for you.

TEXTS, SOFTWAREs, Web Sites

Text required:

- *Modern Database Management*, 13th edition; Authors: Hoffer, Jeffery A., Remesh, V., and Topi, Heikki; publisher Pearson. E-book to rent for the course (<https://bulk-store.vitalsource.com/products/modern-database-management-jeff-hoffer-ramesh-v9780134792293>)

Other readings:

Various links are mentioned in the course material on canvas, and specifically inside the “Big Points Slides”.

Software and Websites :

- Week-0,1: Get your own login & workspace for Apex website for access to Oracle DB. This is free of charge to anyone, the website is apex.oracle.com and select the option "**Request Free Workspace**".
- Week-1: MS-SQL database server to be accessed using SSMS (SQL Server Management Studio). This is hosted by UNT using Citrix server and access details will be provided during the class.

Online learning:

- As a UNT student, you are expected to have access to LinkedIn learning (Links to an external site.) which will be extensively utilized in this course.

Course Canvas Site:

- Course announcements and additional course materials will be posted on Canvas.
- Canvas is available thru a mobile App, it's a very useful app and highly recommended.

Supplementary websites and/or readings:

- [W3 Schools for SQL Practice](#)
- Mongo DB Tutorial and Practice Site: <https://www.tutorialspoint.com/mongodb/>
- This site allows you to run some SQL queries that you can write at the site: <https://tutorialzine.com/2016/01/learn-sql-in-20-minutes>
- This site has given a number simpler examples for different options for SELECT statement <https://www.geeksforgeeks.org/sql-where-clause/>

General technology needs:

Students are expected to have a personal and a location with Internet access, from which they will be able to attend a class (or Q&A sessions) remotely. Inside the entire UNT campus students have excellent Wi-Fi access.

- Install UNT's Respondus browser on the laptop/desktop from UNT Recommended site (<https://download.respondus.com/lockdown/download.php?id=165715487>.)
- Install Zoom app on laptop/desktop and optionally on your smart phone or other suitable devices.

Rules of Engagement

Rules of engagement refer to the way students are expected to interact with each other and with their instructors online or offline. Here are some general guidelines:

- Treat your instructor and classmates with respect in email or any other communication.
- Unless specifically invited, do not refer to your instructor by their first name.
- Use clear and concise language.
- Remember that all college level communication should have correct spelling and grammar (this includes discussion boards and emails).
- Avoid slang terms such as “wassup?” and texting abbreviations such as “u” instead of “you.” Why? Well, such terms may not be known or understood universally.
- Use standard fonts such as Ariel, Calibri, or Times new Roman and use a size 10 or 12-point font.
- Avoid using the caps lock feature AS IT CAN BE INTERPRETTED AS YELLING.
- Limit and possibly avoid the use of emoticons like :) or ;-(
- Be cautious when using humor or sarcasm as tone is sometimes lost in an email or discussion post and your message might be taken seriously or sound offensive.
- Be careful with personal information (both yours and other’s).
- Do not send confidential information via e-mail

See these Engagement Guidelines (<https://clear.unt.edu/online-communication-tips>) for more information.

Success in an Online Course

While the online classroom shares many similarities with the face-to-face classroom, success in online education requires certain skills and expectations that one may not be aware of. Please review this webpage, “How to Succeed as an Online Student” (<https://clear.unt.edu/teaching-resources/online-teaching/succeed-online>).

COURSE SCHEDULE

The topics, assignments, and dates in the syllabus **are subject to change**. All necessary changes will be announced in advance. You are responsible for being aware of such changes.

| Week | Week-of | Topics and Readings | Deliverable |
|------|---------------|--|---|
| 1 | Jan-22 | Course overview / Introductions / chit-chat Create and Populate a DB on Oracle Apex | |
| 2 | Jan-29 | Ch.1: The Database Environment and Development Process | Assignment 1, Project Part-1 Available |
| 3 | Feb-05 | Ch.2: Modeling Data in the Organizations + Working with MS-SQL | Assignment 2 Available Assignment 1 Due Feb-08 |
| 4 | Feb-12 | Ch.5: Introduction to SQL | |
| 5 | Feb-19 | Ch 5: SQL Queries In-Depth, In-Class Exercises. | Project Part-1 Due Feb-22 |
| 6 | Feb-26 | Ch.3: The Enhanced ER Model Ch.6: Advanced SQL | Project Part-2 & Assignment 3 Available |
| 7 | Mar-05 | Midterm Exam (Tuesday Mar-05) 11:00AM to 1:50 pm/NOON CST (MCQ: Ch. 1 – 3, 5, SQL Joins from Ch.6) Lockdown Browser with WebCam Exams are copyrighted. | Assignment-2 Due Mar-07 |
| | Mar-11 | SPRING BREAK | |
| 8 | Mar-18 | Ch.6: Advanced SQL-Review | |
| 9 | Mar-25 | Ch.4: Logical Database Design and the Relational Model Ch.8: Physical Database Design and Performance | Assignment 3 Due Mar-21 Assignment 4 Available |
| 10 | Apr-1 | Ch 10: Big Data Technologies & Intro to NoSQL ; Practice for the Hands-on Exam | Project Part-2 due Mar-28 |
| 11 | Apr-8 | Mongo DB Introduction. Special Topic: Regular Expressions | Practice Hands-on Exam Available |
| 12 | Apr-15 | Mongo DB – Hands-on. Help with Assignment-4 | Assignment 4 due Apr-11 |
| 13 | Apr-22 | Regular Expressions | Peer Reviews Due Apr 27 |
| 14 | Apr-29 | Help with the Practice Hands-on Exam Review for the Hands-on and Final Exam | |
| 15 | Apr-30 | Hands-on Exam (Tuesday Apr-30) 11:00AM to 1:00 pm/NOON CST 90 Minutes, 10 Questions, 20 points, SQL & Regular Expression; Regular Browser Exams are copyrighted. | |
| 16 | May-7 | Final Exam (Tuesday May-7) 11:00AM to 1:50 pm/NOON CST (MCQ: Ch. 4, 5, 6, 8, 10, NoSQL, Mongo DB, Regular Expression) Lockdown Browser with WebCam Exams are copyrighted. | |

COURSE ASSIGNMENTS AND EVALUATION

Instructor may invite randomly selected team and/or individual student to meet over zoom or in person (based on both parties' convenience). The purpose of such meetings will be to give the team or a student an opportunity to explain their responses to work they have submitted to earn grades. If the team or student fails to explain their responses/work or fails to come to the meeting, they may lose all earned points for that activity and may be subject to further penalty or investigation(s) of their prior work and may even be reported for academic integrity violations which may result in action leading up to removal from the course.

In other words, above paragraph states **that the instructor may challenge a team or an individual student to prove that the responses/work submitted is their own** and if they fail to do so then the team or individual student may be subject to further investigation and/or penalty.

Course EXAMS, QUIZ and other evaluation related material is COPYRIGHTED—DO NOT RECEIVE, OR DISTRIBUTE such material, any such incidence is a violation and YOU WILL BE SUBJECTED TO VIOLATION PENALTY.

Your performance will be evaluated as follows:

| Assignments | | Points |
|---------------|--|------------|
| Individual | 9 Chapter Quizzes: each 20 points, Ch 1, 2, 3, 4, 5, 6, 8, 10 MongoDB. | 180 |
| Team | 4 Assignments, each 25 points | 100 |
| Team | Database Project Part-1 | 25 |
| Team | Database Project Part-2 | 25 |
| Individual | Peer Review** Bonus Points | 10 |
| Individual | Hands-on Exam (10 questions each 2 points, 90 minutes) | 20 |
| Individual | Mid-Term Exam (125 Questions each 2 points) | 250 |
| Individual | Final Exam (150 Questions each 2 points) | 300 |
| TOTAL* | | 900 |

*Bonus points may be announced, at the instructor's discretion but not guaranteed. The total bonus points opportunities will not be more than 25 points. For any bonus points there will be NO MAKE-UP opportunities.

** Peer review points earned by an individual will be the average of earned points from the other team members. Those who do not submit evaluation for their peers will earn 0 (zero) points for themselves.

Grades will be assigned as follows:

The letter grading scale (A-F) is based on the total points earned including any bonus points. Please note the letter grade will be based on the actual numerical points earned and it is not based on any percentage (%) calculations that one may see on Canvas.

A = 810+

B = 720-809

C = 630-719

D = 540-629

F = 0-539

Under rare circumstances, instructor may apply some curve and/or offer opportunity to earn bonus points. Bonus points opportunities may be sporadic, announced at the last moment, and available for a limited time—there is NO make-up opportunities if you miss such bonus points opportunities.

Homework assignments

There will be 4 homework assignments as outlined above, all are team based. As a part of the class, you will work on a FIVE (5)-person team. All assignments will be of technical nature and may include installation and configuration of SW, writing queries, and the use of various computing tools. Some of the homework assignments will need to be submitted using Turnitin and will be checked for proper attribution and citations of source materials and **plagiarism**.

Quizzes

There will be 10 quizzes designed to check students' understanding of the module material and to promote student engagement. Quizzes will be timed, contain a variety of closed and (sometimes) open-ended questions, and reflect the content of assigned module readings and end-of-module assignments. Quiz questions will generally be similar but easier than exam questions. All quizzes need to be answered individually without help from other students—this is to benefit one's own learning. Each quiz allows 3 attempts, and the best score will be the final score. In-class assignments (if any) may be individual or group assignments, with students forming ad hoc groups for each assignment. In-class assignments will be submitted by the group during the class.

Term Projects (Two Parts)

As a part of the class, you will work on a term project in a FIVE (5)-person team. The goal of the term project is to provide a database design for a business process or processes. In Part-1 of the project, the team will design a database and create the ERD (entity relationship diagram). In Part-2, the team will create the actual database structures, populate it with self-created data and then write SQL queries for a few business situations. Project final report will be submitted using **Turnitin** software and checked for **plagiarism**. Similarity levels above 20% will result in a grade reduction on the assignment, above 30% will result in a failing grade in on the assignments, above 40% will result in an 'F' in the class for the entire team and an academic integrity report filed for all team members.

Managing teamwork.

Working as a part of a team is a necessity in today's world, so learning to be part of a team is an essential component of this course and it is a required part of the course work.

Students will become part of a team of their own choice in the first week of the class. Instructor will help form a team if someone is having difficulty joining/forming a team. All team members are expected to contribute equitably to the project. It is up to the team to determine equitable distribution of responsibilities for the project. If a team member is not actively contributing to the project, the team is allowed to fire a team member at any time **before the assignment-1 is due**. Each team will choose a team leader, but the team leader has no special privileges except the responsibility to keep the team together. To fire a team member, the team should first issue a warning to the non-contributing team member which clearly states the expectations of contributions, followed (no less than one week later) by a firing notice signed by all remaining team members sent to the team member and the instructor. A team member fired from a team will not receive credit for any assignments submitted by the team after the date of "firing".

Similarly, a team member can elect to quit a team following a similar process. A team member fired by a team or voluntarily leaving the team may team up with other “unemployed” student(s).

Individual submissions are DISCOURAGED but may be rarely allowed in documented exceptional circumstances with prior approval. The instructor will allow anyone to join or form a new team after the assignment-1 is submitted. Thus, assignment-1 should be considered, for a group of individuals, as a practice and test run of becoming a team.

Peer Review Bonus Points: At the end of the semester, each team member submits a peer evaluation document reflecting their score of all other team members BUT not for themselves. The instructor will average those scores for each individual member and assign the final peer review bonus points to everyone. Instructor reserves the right to set aside any earned points and assign as little as 0 (zero) to a student as they see fit. **Those who do not submit score for their peers will earn 0 (zero) points for themselves.**

Exams

There will be a mid-term exam and a final exam. Both exams will be administered as indicated in the schedule. An exam WILL require the use of a laptop with a Respondus lockdown browser and a WebCam. Students would need to use their own laptop for the exam. Laptops are available for check out from UNT libraries. No make-up exams will be given with the exception of cases of documented medical or family emergency or some extra ordinary circumstances beyond one's control.

For all exams using online proctoring tools (e.g., LockDown Browser), you will be asked to show a thorough 360-degree view of your exam environment. If for any reason, you are unable or unwilling to do provide the 360-degree view of your environment, your exam results will be withheld pending 1-on-1 over zoom review of the exam with the instructor.

COURSE POLICIES

Late Submission Policy

All quizzes, assignments, HomeWorks, projects, reviews are due at the time indicated in the schedule. There is NO exception to this policy except for documented medical or family emergency or some extra ordinary circumstances beyond one's control.

Student email information

Enabling students' access to certain web or cloud computing resources used in this class requires releasing student UNT email information to cloud providers and affiliated parties. It is your responsibility to notify the instructor within 5 days from the beginning of the semester if you DO NOT want your email information to be released. In such case, you assume the responsibility for procuring access to the necessary cloud resources.

Professional Communication

Students will communicate with the instructor verbally and in writing using professional language. All written communication will be composed using proper grammar and spelling. All course content related, and other technical questions and comments are to be conducted only via the discussion boards set-up on Canvas. Use direct emails (NOT CANVAS) for question or comments of personal nature (not on canvas). All student emails to the instructor will be sent from the student's official UNT email with a subject line starting with: **BCIS 5420: <Type of concern>.** Emails sent in violation of these guidelines will be ignored. All grade related questions and concerns need to be communicated in writing over email (not on

canvas) with the subject line: **BCIS 5420: Grade Concern**. Any grade-related emails should only contain information relevant to the grade in question. Any references to your grades in other courses, or the impact of the grade on your overall academic standing are irrelevant and will result in the grade concern being dismissed.

Class attendance and participation

This is an online class but synchronous, so the class attendance is required. During the online session, the use of WebCam is mandatory—if you have special circumstances for not using WebCam then let the instructor know at the start of the session. Online session does NOT mean you can join anytime, please join within the first 5 minutes of the beginning of the session—its likely that someday the session may be locked. If any bonus point activities are done in the class then there will not be any make-up opportunity **except for UNT approved DOCUMENTED EXCEPTION**.

Student conduct

Students are expected to behave in a respectful and professional manner when in class and when interacting with the instructor and other students. Talking in class during the lecture is very disruptive even when done at a low voice. If you want to contribute or ask a question, please raise your hand. Students engaging in disruptive behavior, including talking during the lecture without an explicit permission, will be asked to leave the classroom resulting in an absence and a corresponding grade penalty as described in the section on attendance. Disruptive students, including those talking in class without permission of the instructor, who refuse to leave the class will incur grade penalties up to a failing grade in the course, will be reported to the Dean of Students, and may be forcefully removed from the classroom by the UNT police.

Health-related absences

Students are expected to attend class meetings regularly and to abide by the attendance policy established for the course. If you cannot attend a specific class section due to a health-related reasons, it is important that you communicate with the me prior to being absent so that we can discuss and mitigate the impact of the absence on your attainment of course learning goals. If you experience a medical emergency that may result in more than one absence or inability to submit assignments on time, please notify the Dean of Students and the instructor as soon as possible to minimize the impact on academic standing.

Class Recordings & Student Likenesses

I may record class lectures and presentations, and may provide access to recordings to students who miss a class due to a medical or health reason. Class recordings are the intellectual property of the university or instructor and are reserved for use only by students in this class and only for educational purposes. Students may not post or otherwise share the recordings outside the class, or outside the Canvas Learning Management System, in any form. Failing to follow this restriction is a violation of the UNT Code of Student Conduct and could lead to disciplinary action.

Penalty for academic integrity violations

Students found to be in violation of academic integrity standards will incur penalties ranging from a failing grade of a specific assignment to a failing grade in the course. Cheating on an exam or assisting others in cheating, misrepresenting others' work as your own, and severe plagiarism (over 30% similarity on the project) will result in a grade of **F** in the course. All academic integrity violations will be reported to the Academic Integrity Office.

COLLEGE OF BUSINESS AND UNIVERSITY POLICIES AND PROCEDURES

Academic Integrity Standards and Consequences

According to UNT Policy 06.003, Student Academic Integrity (available at <https://vpaa.unt.edu/fs/resources/academic/integrity>), academic dishonesty occurs when students engage in behaviors including, but not limited to: cheating, fabrication, facilitating academic dishonesty, forgery, plagiarism, and sabotage. A finding of academic dishonesty may result in a range of academic penalties or sanctions ranging from admonition to expulsion from the University.

Additional information regarding RCOB and ITDS academic integrity policies and practices will be posted on the Canvas site. All students are expected to sign and submit a copy of ETHICAL BEHAVIOR IN ITDS CLASSES form.

Acceptable Student Behavior

Student behavior that interferes with an instructor's ability to conduct a class or other students' opportunity to learn is unacceptable and disruptive and will not be tolerated in any instructional forum at UNT. Students engaging in unacceptable behavior will be directed to leave the classroom and the instructor may refer the student to the Dean of Students to consider whether the student's conduct violated the Code of Student Conduct. The university's expectations for student conduct apply to all instructional forums, including university and electronic classroom, labs, discussion groups, field trips, etc. The Code of Student Conduct can be found at <https://deanofstudents.unt.edu/conduct>.

ADA Accommodation

UNT makes reasonable academic accommodation for students with disabilities. Students seeking accommodation must first register with the Office of Disability Accommodation (ODA) to verify their eligibility. If a disability is verified, the ODA will provide a student with an accommodation letter to be delivered to faculty to begin a private discussion regarding one's specific course needs. Students may request accommodations at any time, however, ODA notices of accommodation should be provided as early as possible in the semester to avoid any delay in implementation. Note that students must obtain a new letter of accommodation for every semester and must meet with each faculty member prior to implementation in each class. For additional information see the ODA website at <http://disability.unt.edu>

Student Evaluation Administration Dates.

Student feedback is important and an essential part of participation in this course. The student evaluation of instruction is a requirement for all organized classes at UNT. The survey will be made available during weeks 13, 14 and 15 of the long semesters to provide students with an opportunity to evaluate how this course is taught. Students will receive an email from "UNT SPOT Course Evaluations via IASystem Notification" (no-reply@iasystem.org) with the survey link. Students should look for the email in their UNT email inbox. Simply click on the link and complete the survey. Once students complete the survey they will receive a confirmation email that the survey has been submitted. For additional information, please visit the SPOT website at www.spot.unt.edu or email spot@unt.edu.

Emergency Notification & Procedures.

UNT uses a system called Eagle Alert to quickly notify students with critical information in the event of an emergency (i.e., severe weather, campus closing, and health and public safety emergencies like chemical spills, fires, or violence). In the event of a university closure, please refer to Blackboard for contingency plans for covering course materials.

Emergency Evacuation Procedures for Business Leadership Building

Severe Weather. In the event of severe weather, all building occupants should immediately seek shelter in the designated shelter-in-place area in the building. If unable to safely move to the designated shelter-in-place area, seek shelter in a windowless interior room or hallway on the lowest floor of the building. All building occupants should take shelter in rooms 055, 077, 090, and the restrooms on the basement level. In rooms 170, 155, and the restrooms on the first floor.

Bomb Threat/Fire. In the event of a bomb threat or fire in the building, all building occupants should immediately evacuate the building using the nearest exit. Once outside, proceed to the designated assembly area. If unable to safely move to the designated assembly area, contact one or more members of your department or unit to let them know you are safe and inform them of your whereabouts. Persons with mobility impairments who are unable to safely exit the building should move to a designated area of refuge and await assistance from emergency responders. All building occupants should immediately evacuate the building and proceed to the south side of Crumley Hall in the grassy area, west of parking lot 24.