Course	**BCIS 5610.001, 002**
Course Title	**Data Warehousing**
Professor	Kashif Saeed
Term	Fall 2022
Meetings	Wednesdays 6:30pm – 9:20pm; BLB 005

Professor's Contact Information

Office Phone	(940) 565-4769
Office Location	BLB 312E
Email Address	Kashif.saeed@unt.edu
Office Hours	Mondays & Wednesdays 5pm-6pm (by appointment only)
TA Information	TA information & office hours will be posted on Canvas

General Course Information

Pre-requisites, Co-requisites, & other restrictions	None **This class requires a Windows laptop for hands-on and assignments. Mac users must install a Windows VM.**
Course description	The course covers traditional (non-SAP) data warehousing concepts. We cover Data Modeling (ER and Ralph Kimball Dimensional Modeling) and Business Intelligence in this class. ETL is not covered in detail in this course, however, the instructor will share important details and an optional assignment on ETL. The course will be divided into 3 major parts: 1. Database fundamentals and ER Modeling 2. Designing a Data Warehouse using Ralph Kimball methodology 3. Using a Business Intelligence tool on top of a data warehouse Additional topics may include the following: - An overview of Statistics - Getting started with Python programming - An overview of Google BigQuery - SQL - DML The additional topics covered will be part of the exams.
Laptop requirements	Due to the hands-on nature of the work that we will perform, the class requires that students bring their laptops to class every week. QlikView only works on a Windows laptop; students with a Mac have to install a Windows VM to make the software work. Those with a Mac must contact the TA ASAP. The instructor will provide install instructions for the software – it is the responsibility of the student to install the software and work with the TA to resolve any issues with software installation. If the TA is not able to help with software related issues, it is the responsibility of the student to arrange another laptop.
Random knowledge checks	The instructor reserves the right to randomly select students for knowledge checks on the assignments and/or exams. Failure to answer questions about

	how the work was completed may result in a reduced grade. The reduction in points is at the discretion of the instructor.
Key to Success in this course	• Attend classes and pay attention in the class • Take notes – the entire exam will be from topics and discussions covered in the class • Good understanding of the assignments – there can be questions in the exams from the assignments • If you have doubts, ask questions
Optional Texts & Materials	The books listed below are for <u>reference only</u>. The course is topic based and does not cover a textbook chapter by chapter. The instructor will provide handouts for each lecture – exams will be from instructor handouts and assignments. You are not required to buy any of the following books. 1. Database Refresher and ER Modeling: Database Concepts by David M. Kroenke & David Auer 2. Dimensional Modeling: Data warehouse Lifecycle Toolkit by Ralph Kimball 3. Data Warehouse Design Solutions by Michael Venerable, Christopher Adamson 4. QlikView 11 for developers by Miguel Garcia and Barry Harmsen
Software Used	1. MySQL and MySQL Workbench Download Link will be provided on eLearning 2. A Business Intelligence tool of instructor choice Download Link: Will be posted on eLearning 3. **Lockdown browser** https://clear.unt.edu/supported-technologies/respondus-lockdown-browser

Assignments & Academic Calendar

Class#	Date	Topics to be covered	Assignments
1	Aug 31	**Part 1: Database Fundamentals & ER Modeling** • Introductions and course details • Syllabus Overview and Expectations • The data picture in enterprise • Database Refresher Concepts	Task 1: Install MySQL and MySQL Workbench. Also, install Lockdown browser on your laptop. Due date: Sept 7, 2022
2	Sept 7	• Database refresher concepts - • ER Modeling & database design • Classroom examples	
3	Sept 14	• ER Modeling & database design wrap up • Assignment 1 discussion • Exam 1 discussion • Additional topic(s)	Assignment 1: ER Modeling Follow the due date on Canvas.
4	Sept 21	**Exam 1 (in-person)** **Syllabus**: Everything covered in the class up till this point	

		Part 2: Designing a Data Warehouse • Case for Dimensional Modeling • ER vs. Dimensional Modeling • Dimension and Fact tables • 4 Step Design process • Classroom Hands-on – Design your first Fact table	
5	Sept 28	• Time dimension • Null handling • Conformed dimensions • Concept of Granularity	
6	Oct 5	• Slowly Changing Dimensions - Type 1, Type 2, and Type 3 • Classroom Hands-on – Design a Type 2 SCD • Role Playing Dimensions • Classroom Hands-on – Design a multi-star schema Dimensional Model.	Assignment#2 Creating a Dimensional Model and implementing it in MySQL Due date: Follow the due dates on Canvas
7	Oct 12	• Fact less facts • Classroom Hands-on – Design a fact less fact table • Using an existing data warehouse in your company • Understanding SQL in a data warehouse environment • Data Warehouse use cases • Exam 2 Review	
8	Oct 19	**Exam 2 (in-person)** **Syllabus**: Everything covered post Exam 1 **Part 3: Using a BI tool** • Introduction to Business Intelligence • BI Architecture Concepts • Semantic layer	
9	Oct 26	• Architectural overview of QlikView • Introduction to Development using QlikView • QlikView hands-on • QlikView scripting	
10	Nov 2	• QlikView Development • Synthetic keys • Concatenation • Resolving loops in QlikView	Assignment#3 QlikView Project Due date: Follow the due dates on Canvas
11	Nov 9	• QlikView Front-end development • Class hands-on on QlikView front-end development • QlikView Server and memory management	

		· Scaling, Partitioning, indexing, etc.	
12	Nov 16	· Introduction to Tableau · Tableau Architecture · Limitations of Tableau · Tableau Hands-on	Assignment#4 Tableau Project Due date: Follow the due dates on Canvas
13	Nov 23	Thanksgiving break – No class	
14	Nov 30	· Additional topics based on the class needs	
15	Dec 7	**Exam 3 (in-person)** **Syllabus**: topics covered post exam 2	

Course Policies

Grading (credit) Criteria	**Grading Criteria** A: 360+ points OR top 30% based on total enrolled (after last date to drop) B: 320-359 points OR Next 40% based on total enrolled (after last date to drop) C: 240-319 points OR Next 20% based on total enrolled (after last date to drop) D and F: Below 240 OR bottom 10% based on total enrolled (after last date to drop) **Grading Points (400 total)** Assignments – 100 points (4 assignments @ 25 points each) Pop quizzes –60 points Exam 1 – 80 points Exam 2 – 80 points Exam 3 – 80 points
Academic Integrity	According to the UNT's academic integrity policy 06.003, "Academic Misconduct" means the intentional or unintentional action by a student to engage in behavior in the academic setting including, but not limited to: cheating, fabrication, facilitating academic misconduct, forgery, plagiarism, and sabotage. Any act of academic misconduct will not be tolerated and will result in an 'F' in the class.
Exams and Quizzes	Exams and quizzes will be conducted via Respondus Lockdown browser during class hours. Given that this is a face-to-face class, the exams will only be conducted in person.
Make-up Exams	There will be no make-up exams. However, I will work with you if you have a date conflict and would like to change the date of your exam.
Extra Credit	None
Late Work	Penalty on late assignments will be listed on the Assignment itself.
Software Installation	It is your responsibility to install the software. The instructor and the teaching assistant are available to help; however, you must not assume that the instructor and/or teaching assistant will install the software for you.
Assignments	It is your responsibility to complete the assignments with or without the teaching assistant help. Remember that the teaching assistant is not responsible to solve your assignments for you – he/she can only guide you and provide high-level support to get past the obstacle that you may be experiencing.
Classroom Citizenship	Your behavior interferes with my ability to teach and student's ability to learn; unacceptable behavior will not be tolerated in my class. Students engaging in disruptive behavior will be asked to leave the classroom and will be referred to the center of student rights and responsibilities.

	Chatting, giggling, laughing, use of cell phone or other hand-held devices, texting, using a laptop while the instructor is teaching, making noises, etc. are examples of disruptive behavior. **Penalty for Disruptive Behavior:** • You will lose 15 Grade Points per offense of disruptive behavior for the first two offenses. The instructor will note down your name and will deduct the points at the end of the semester. • After two offenses of disruptive behavior, you will lose 30 points per offense. • These points will be deducted from your Exam and Assignment total. In addition, the instructor reserves the right to move you to a different seat during exams if the instructor believes that you are involved in cheating, plagiarism, or disrupting others.
Exam Reviews	Exam Reviews do not mean that I will provide highlighted text the exam will be from or provide sample question for the exam. Exam Reviews mean that you will have class time to clear any doubts you may have from the previous classes; it is my responsibility to ensure that I explain to clear your doubts, but it is your responsibility to come prepared to the exam review class to ask questions. If you have not attended classes prior to the exam review, do not assume that I can cover the material from all previous classes in the exam review class.
Class Attendance	Strongly recommended – missed quizzes cannot be made up.
UNT Policies	**Academic Integrity Standards and Sanctions for Violation.** According to UNT Policy 18.1.16, Student 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. [Insert specific sanction or academic penalty for specific academic integrity violation]. **ADA Statement.** 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 disability.unt.edu **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 on 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, wests of parking lot 24.

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 deanofstudents.unt.edu/conduct.

Student Perceptions of Teaching. 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 and 14 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.

The descriptions, timelines, grading policies, or other information contained in this syllabus
are subject to change at the discretion of the professor.

ETHICAL ACADEMIC BEHAVIOR IN ITDS CLASSES

The UNT College of Business and the ITDS Department expect their students to behave at all times in an ethical manner. There are at least two reasons for this. First, ethical behavior affirms the personal value and worth of the individual. Second, professionals in all fields (but particularly in information systems, accounting, and HR) frequently handle confidential information on behalf of their employers and clients. Thus employers of UNT College of Business graduates expect ethical conduct from their employees because that behavior is crucial to the success of the organization. Academic dishonesty is a major violation of ethical behavior.

Students are expected to read (https://policy.unt.edu/policy/06-003) UNT's Student Standards of Academic Integrity which defines academic dishonesty and sets out the consequences for unethical academic behavior. Cheating and plagiarism are the most common types of academic dishonesty.

The UNT's Student Standards of Academic Integrity policy defines cheating as: *The use of unauthorized assistance in an academic exercise, including but not limited to:*
1. *Use of any unauthorized assistance to take exams, tests, quizzes or other assessments;*
2. *Dependence upon the aid of sources beyond those authorized by the instructor in writing papers, preparing reports, solving problems or carrying out other assignments;*
3. *Acquisition, without permission, of tests, notes or other academic materials belonging to a faculty or staff member of the University;*
4. *Dual submission of a paper or project, or re-submission of a paper or project to a different class without express permission from the instructor;*
5. *Any other act designed to give a student an unfair advantage on an academic assignment.*

The university's policy defines plagiarism as the "*Use of another's thoughts or words without proper attribution in any academic exercise, regardless of the student's intent, including but not limited to:*
1. *The knowing or negligent use by paraphrase or direct quotation of the published or unpublished work of another person without full and clear acknowledgement or citation.*
2. *The knowing or negligent unacknowledged use of materials prepared by another person or by an agency engaged in selling term papers or other academic materials.*

Examples of academic dishonesty in an ITDS class include: copying answers from another person's paper; using notes during an exam; copying computer code from another person's work; having someone else complete your assignments or take tests on your behalf; stealing code printouts, software, or exams; recycling assignments submitted by others in prior or current semesters as your own; and copying the words or ideas of others from books, articles, reports, presentations, etc. for use as your own thoughts without proper attribution (i.e., plagiarism). It does not matter whether you received permission from the owner of the copied work; claiming the material as your own is still academic dishonesty.

The ITDS Department believes it is very important to protect honest students from unfair competition with anyone trying to gain an advantage through academic dishonesty. Academic dishonesty is not tolerated in ITDS classes, and those who engage in such behavior are subject to sanctions as outlined in the UNT's policy and/or the course syllabus. You are strongly encouraged to read the policy carefully so that you are aware of what constitutes academic dishonesty and the consequences of this unethical behavior.

By signing below, I acknowledge my responsibility to read the UNT academic dishonesty policy and the Student Standards of Academic Integrity (https://policy.unt.edu/policy/06-003); and attest that I have read and understand the statements in this document and agree to behave ethically in this class.

_____   _____
Student Name (Print)   Student ID No.

_____   _____
Student Signature   Date

UNIVERSITY OF NORTH TEXAS
Authorization to Release Assignments to Plagiarism Detection Service

Written assignments in this course will be provided to an internet-based plagiarism detection service that is not affiliated with the University of North Texas. If you sign the form, your assignments may be submitted to the service with your name or student identification number (but only if you put this number on your assignment which you should never do in this course). **If you do not sign this form, you must sign the bottom section acknowledging that it is your responsibility to make sure your name and other identifying information only appear on the coversheet of your assignments – Your cover sheet will not be included when the rest of your assignment is submitted to the service**. This authorization is only to allow the instructor to manage more efficiently the course and will expire upon the issuance of a final grade. Please sign and date the authorization form. Return the form to the instructor upon completion. You are not required to sign this authorization and you will not be penalized if you do not sign the form; however, if you do not wish to sign it you are required to complete the section at the bottom of the form.

I, _____ **[Print Name of Student],**

hereby voluntarily authorize the instructor in BCIS 4690 to disclose assignments that contain my name and/or student identification number (if for some reason I chose to include on my assignments) to an internet-based plagiarism detection service. (There is no reason you would ever put your student identification number in any assignment for this course.)

This authorization will remain in effect from the date it assigned until a grade is assigned in this course and does not apply to any other course in which I am enrolled at the University of North Texas.

_____   _____

Student Signature   Date

_____

SIGN & DATE ABOVE
OR
SIGN & DATE THE SECTION BELOW

_____

I, _____ **[Print Name of Student],**

understand that by not agreeing to the above part of this form it is my responsibility to make sure that my name and other identifying information only appear on the coversheet of all my assignments (including team assignments) since my instructor will submit the rest of my assignments (excluding the coversheet) to an internet-based plagiarism detection service.

_____   _____

Student Signature   Date

UNT College of Business Student Ethics Statement

As a student of the UNT College of Business, I will abide by all applicable policies of the University of North Texas, including the Student Standards of Academic Integrity, the Code of Student Conduct and Discipline and the Computer Use Policy. I understand that I am responsible reviewing the policies as provided by link below before participating in this course. I understand that I may be sanctioned for violations of any of these policies in accordance with procedures as defined in each policy.

I will not engage in any acts of academic dishonesty as defined in the Student Standards of Academic Integrity, including but not limited to using another's thoughts or words without proper attribution (plagiarism) or using works in violation of copyright laws. I agree that all assignments I submit to the instructor and all tests I take shall be performed solely by me, except where my instructor requires participation in a group project in which case I will abide by the specific directives of the instructor regarding group participation.

While engaged in on-line coursework, I will respect the privacy of other students taking online courses and the integrity of the computer systems and other users' data. I will comply with the copyright protection of licensed computer software. I will not intentionally obstruct, disrupt, or interfere with the teaching and learning that occurs on the website dedicated to this course through computer "hacking" or in any other manner.

I will not use the university information technology system in any manner that violates the UNT nondiscrimination and anti-sexual harassment policies. Further, I will not use the university information technology system to engage in verbal abuse, make threats, intimidate, harass, coerce, stalk or in any other manner which threatens or endangers the health, safety or welfare of any person. Speech protected by the First Amendment of the U.S. Constitution is not a violation of this provision, though fighting words and statements that reasonably threaten or endanger the health and safety of any person are not protected speech.

Student Standards of Academic Integrity
http://policy.unt.edu/sites/default/files/untpolicy/pdf/7-Student_Affairs-Academic_Integrity.pdf

Code of Student Conduct and Discipline
http://conduct.unt.edu/sites/default/files/pdf/code_of_student_conduct.pdf

Computer Use Policy: http://policy.unt.edu/policy/3-10

By signing below, I acknowledge my responsibility to read the UNT academic dishonesty policy and the Student Standards of Academic Integrity (https://policy.unt.edu/policy/06-003); and attest that I have read and understand the statements in this document and agree to behave ethically in this class.

_____ _____
Student Name (Print)   Student ID No.
_____ _____
Student Signature   Date