Course	**BCIS 4660.002**
Course Title	**Introduction to Data Warehousing**
Professor	Dr. Obi Ogbanufe
Term	Fall 2021
Meetings	Weds - 6:30pm – 9:20pm.

Professor's Contact Information

Office Phone	(940) 565-3111
Office Location	BLB 357D (*Please note that 3rd floor may be locked due to COVID-19*)
Email Address	Obi.Ogbanufe@unt.edu
Office Hours	Wednesdays live on Zoom: 11:00 am-12:00 pm (or by appointment)
TA Information	TA Office hours will be posted on Canvas
Course Communication	Please use Obi.Ogbanufe@unt.edu to ask questions about class or assignments. Be sure to include "BCIS 4660: 002" and your email subject in the subject line of your email. Expect email response within 24 hrs. See link for help with instructor communications (https://clear.unt.edu/online-communication-tips)

Course Description

This course investigates model-based approaches to the design of data warehouses. Examines their critical role in decision systems for business and industry. Specifically, the course covers traditional data warehousing concepts. We cover Database Design, Data Modeling (ER and Ralph Kimball Dimensional Modeling), Business Intelligence, and ETL in this class.

Course Structure

This course takes place in-person. There are 14 weeks of content that you will move through. I will open up a new module each week.

Course Prerequisites or Other Restrictions

BCIS 3610 with grades of C or better; DSCI 3710 or 3870; 2.7 GPA. Grades of C or better in each previously taken BCIS and DSCI course, or consent of department.

Course Objectives

Upon successful completion of this course, students should be able to:

1. Describe problems and opportunities when dealing with business intelligence
2. Understand database fundamentals and ER Modeling
3. Design a Data Warehouse using Ralph Kimball methodology
4. Create and manage ETL Solutions in a Data Warehouse
5. Apply and use data warehouses, ETL, and reporting tools to create a Business Intelligence solution

Textbooks and materials:

1. **Recommended**: Introduction to Databases and Data Warehouses, 2nd Edition by Jukic, Vrbsky, Nestorov, and Sharma. Prospect Press, copyright 2021. ISBN: 978-1-943153-68-8

- **Recommended**: Data Warehouse Lifecycle Toolkit by Ralph Kimball: ISBN-13: 978-0471200246; ISBN-10: 0471200247
- **Required Reading:** The instructor will provide some papers about database, and other written text for students to read.

Key to Success
1. Attend classes and pay attention in class.
2. Take notes – the exam will be from topics and discussions covered in the class.
3. Complete in-class work, in class.
4. Commit to spending at least 8-10 hours a week working on assignments, reflecting on the material covered, and participating in other activities throughout the course.
5. If you have any questions, please ask.

Software (*Instructor will provide the links/guide for downloading and installing*)
1. Microsoft SQL Server 2019
2. Microsoft SQL Server Integration Services
3. Visual Studio 2019
4. Microsoft Power BI Desktop

Technical Requirements
1. Windows 10 computer is required for this class and for the software to function
   a. **Come to class with your computers and software or VMWare installed.**
2. Updated Lockdown browser**. https://clear.unt.edu/supported-technologies/respondus-lockdownbrowser**
3. Reef - iClicker

Assignments & Academic Calendar (Subject to change)

Lecture	Learning Objectives	Material	Assessment	Activities
Week 1 Aug 25	**DW/BI Opportunities** • Review course objectives and outcomes • Participate in discussions • Describe BI/DW concepts	• Course syllabus • Start here module • 01_IntroductionDW • SQL Server Install Requirements	• Quiz0: Syllabus • Quiz1: DW Concepts	• Introduce yourself • iClicker sync tryout
Week 2 Sept 1	**Database Essentials I** • Review RDBMS concepts • Review SQL DDL, DML statements • Explore SQL Server 2019	• 02_Database Essentials-Part1	• Quiz2: DB Essentials • Assignment#1: SQL Server	• Read/Review Starks – Chapter 1
Week 3 Sept 8	**Database Essentials II** • Understand database design concepts • Apply SQL DDL, DML statements	• 03_Database Essentials-Part2 • 02_Restore Sample Databases Instructions	• Quiz3: SQL	• Restore Sample Databases • Read/Review Starks – Chapters 2, 3, Appendix B

Week 4 Sept 15	**ER Modeling & DW Fundamentals** • Design logical database • Understand normalization • Translate ER Models to physical design	• 04_ERModeling	• Quiz4: DB Design • Assignment#2: Database Design	• Read/Review Starks – Chapters 5, 6 • Practice normalization
Week 5 Sep 22	**Dimensional Modeling, I** • Understand dimensional modeling • Contrast ER vs. Dimensional Modeling • Understand Dimension/Fact tables	• 05_Dimensional Modeling-I	• Quiz5: DM Modeling • Assignment#3: Implement ER model	• Read/Review Kimball Chapter 1 • Design fact table
Week 6 Sep 29	**Dimensional Modeling, II** • Design Dimension/Fact tables	• 06_Dimensional Modeling-II		• Read/Review Kimball Chapter 2 • Design fact table • Test Lockdown Browser
Week 7 Oct 6	**Dimensional Modeling, III** • 4 Step Design process • Evaluate dimensional modeling for retail • Evaluate different types of dimensions	• 07_Dimensional Modeling-III	• Quiz6: DM Modeling • Assignment#4: Implement dimensional model	• Read/Review Kimball Chapters 3 • Design Dimension tables
Week 8 Oct 13	**ETL in a Data Warehouse, I** • Explore ETL with SSIS • Explore Source Data	• 08_ETL Intro • Exam1_Review	• Quiz7: ETL Introduction	• Explore SSIS in Visual Studio
Week 9 Oct 20th	**Exam 1 (250 pts)** Syllabus: Week 1 to 7 Question type(s): Multiple Choice, Multiple Answers, True/False, Matching pairs, and Essay	Exam will be conducted via Canvas using Lockdown browser. Make sure that you have Lockdown browser installed.		
Week 10 Oct 27	**ETL & Data Flows II** • Implement SSIS Data Flow • Design control flow • Implement SSIS control flow	• 10_ETL-II	• Quiz8: ETL SSIS	• Explore SSIS in Visual Studio • Design an ETL package

Week 11 Nov 3	**Reporting and Business Intelligence I** • BI tools and Data Warehouses • BI and reporting	• 11_ BI-Reporting	• Quiz9: BI Intro • Assignment#5 ETL Package	• Design and execute an ETL package
Week 12 Nov 10	**Reporting and Business Intelligence II** • BI tools and Data Warehouses • BI and reporting	• 12_BI-Reporting	• Quiz10: BI Application	Explore BI reporting applications
Week 13 Nov 17	**Deploy a Cloud Data Warehouse** • Explore Cloud based DW • Implement Azure Cloud DW • Integrate Cloud DW and On-Premise DW	• 13_CloudDW	• Assignment#6 BI Reporting	Explore Azure Cloud based DW
Week 14 Nov 24	**Advanced Topics** • Predictive Analytics • Data Mining	• 14_DWAdvanced		**Thanksgiving**
Week 15 Dec 1	**Exam Review** • Exam review and discussion	• Exam2-Review		
Week 16 Dec 8	**Exam 2 (250 points)** Question type(s): MCQs, Multiple Answers, True/False, Matching pairs, and Essay	Exam will be conducted via Canvas using Lockdown browser	Final Exam time is set by UNT	

Fall Final Exam Schedule: https://registrar.unt.edu/exams/final-exam-schedule/fall

Grading

Assessment:

Deliverables	Points	Percent of Score
Assignments (6)	300	30%
Exam 1	250	25%
Exam 2	250	25%
Quizzes (10)	100	10%
In-class activities and discussions	100	10%
Instructor's assessment of participation & professionalism	**Extra**	
Total	**1000**	**100%**

Grading Scale*

Point Total	Letter Grade
900+	A
800+	B
700+	C
600+	D
- 599	F

* This grading scale is tentative and may be adjusted at the end of the semester based on overall class performance. No extra credit is planned for this course, but if any is offered it will be presented as "points" not the raw scores.

Course Policies

Attendance and participation	**Regular class attendance and informed participation are expected and strongly recommended.** Final grades in the course are determined, in part, by in-class activities, participation, and course discussions. Due to the nature of participations/discussions that occur during scheduled class sessions, missed participation cannot be made up. **COVID-19 impact on attendance**. While attendance is expected as outlined above, it is important for all of us to be mindful of the health and safety of everyone in our community, especially given concerns about COVID-19. Please contact me if you are unable to attend class because you are ill, or unable to attend class due to a related issue regarding COVID-19. It is important that you communicate with me prior to being absent as to what may be preventing you from coming to class so I may make a decision about accommodating your request to be excused from class. If you are experiencing cough, shortness of breath or difficulty breathing, fever, or any of the other possible symptoms of COVID-19 (https://www.cdc.gov/coronavirus/2019-ncov/symptomstesting/symptoms.html), please seek medical attention from the Student Health and Wellness Center (940-565-2333 or askSHWC@unt.edu) or your health care provider. While attendance is an important part of succeeding in this class, your own health, and those of others in the community, is more important.
Announcements	In addition to in-class announcements, important messages may be communicated via *Canvas*. Students are responsible for actively monitoring *Canvas* for announcements which, among other things, may be related to changes in schedule, syllabus, or other key aspects of the course.

Exams and Make-up Exams	All exams in this course will require LockDown Browser. There will be no make-up exams. However, I will work with students who have excused conflicts (*see UNT excused conflicts*).
Extra Credit	None planned.
Late Work	<mark>Late submission of homework assignments (6) incur a daily 5% deduction. Please plan accordingly.</mark>
Software Installation	It is the student's responsibility to install the software. The instructor and the teaching assistant are available to help; however, students MUST NOT assume that the instructor and/or teaching assistant will install the software for them.
Assignments	All deliverables and assignments for this course must be submitted electronically through Canvas. Alternative submission methods (e.g., paper, email, USB drive) are not acceptable. Assignments are due **at 11.59pm** unless otherwise stated on the syllabus calendar or an announcement is made on Canvas. It is the student's responsibility to complete the assignments with or without the teaching assistant help. Keep in mind that the teaching assistant is NOT responsible for solving student's assignments – they only provide guidance and high-level support for overcoming obstacles experienced by the student. The homework assignments are to be solved **individually**. This means that you are not to solve problems together or compare answers prior to turning in the work. **You need to create a new document/file to complete each assignment.** Cooperative efforts on individual work will result in an immediate score of zero for all parties involved. The purpose of the homework assignments is to provide you with the kind of practice and exposure opportunities you need to master the underlying concepts and techniques.

Professionalism & Classroom Citizenship	As in all business courses, students are expected to act professionally inside and outside of the classroom. To facilitate and develop these attributes you will be assessed by the following:
	
	1. *Appropriate Use of Help*. When requesting help from the professor, you are expected to have read the background material and have made a reasonable effort to solve the problem beforehand. It is important that you exercise your ability to think and problem-solve before asking for help. Asking for help when you have not made a sincere effort to complete the problem or assignment is unprofessional, not acceptable, and may result in reduction of professionalism points.
	2. *Frequently Asked Questions:* Be sure to review the FAQ to see if your questions have already been answered and addressed.
	3. *Classroom Conduct*. In order to maintain a professional atmosphere in the classroom, students should do the following:
	    • Arrive early so that class can start on time. Late attendance is disruptive, unprofessional, and will negatively affect your grade.
	    • Be prepared to participate—refusing to participate in the discussion shows you are not prepared.
	    • Do not browse the web, play games, text, or engage in private conversations during lectures and presentations.
	4. *Courteous Behavior*. Professionalism includes treating the professor and other class members with courtesy and respect. Examples of discourteous behavior include—but are not limited to—dominating class discussion time, groveling for points, and demeaning someone else's comments.

Exam Reviews	Exam Review is a dedicated class time that provides students an opportunity to ask exam related questions. Please come prepared to the exam review class to ask questions. Exam Reviews DO NOT mean that the instructor will provide sample questions for the exam. If a student has not attended classes prior to the exam review, student should not assume that the instructor will cover material from all previous classes in the exam review class.
UNT Policies	<u>**Academic Integrity Standards and Sanctions for Violation.**</u> According to UNT Policy 06.003, 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. <u>**ADA Accommodation Statement.**</u> 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. <u>**Emergency Evacuation Procedures for Business Leadership Building:**</u> **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.

Sexual Assault Prevention. UNT is committed to providing a safe learning environment free of all forms of sexual misconduct. Federal laws and UNT policies prohibit discrimination on the basis of sex as well as sexual misconduct. If you or someone you know is experiencing sexual harassment, relationship violence, stalking and/or sexual assault, there are campus resources available to provide support and assistance. The Survivor Advocates can be reached at SurvivorAdvocate@unt.edu or by calling the Dean of Students Office at 940-565- 2648.

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 4660 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