Data Analytics 1

ADTA 5130 Sections 400
100% online, Aug 18 – Oct 10, 2025

Instructor Contact

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About the Professor / Instructor

Welcome to ADTA 5130 Data Analytics 1. I am John Schroeder, the instructor for this course and an Adjunct Faculty member of the Advanced Data Analytics department. I work full-time as a data scientist for Lockheed Martin Aeronautics in Fort Worth. Prior to Lockheed Martin, I was an operations research analyst in the United States Air Force for 20 years. I have a Masters in Applied Mathematics from the University of Nebraska and a Bachelors in Mathematics from the United States Air Force Academy.

I am excited to get to know each of you as we explore a variety of statistical analysis tools, choose appropriate methods, interpret the output, and make decisions to achieve the desired outcome.

Communication Expectations: The preferred way to contact me is via email. I do not have a campus office, but I am happy to chat with you on a virtual meeting. Emails will be answered as quickly as possible, usually in one business day or less. Fridays work best for me, but I understand that waiting for Friday is not always possible. If I have not responded within one business day, please resend your message as student emails occasionally are routed to the junk folder. Please visit our Online Communication Tips (https://clear.unt.edu/online-communication-tips) for general guidelines to assist you in your online communications.

Welcome to UNT!

As members of the UNT community, we have all made a commitment to be part of an institution that respects and values the identities of the students and employees with whom we interact. UNT does not tolerate identity-based discrimination, harassment, and retaliation. UNT's full Non-Discrimination Policy can be found in the UNT Policies section of the syllabus.

Required Materials

One textbook is required for this course. See the Course Introduction module in CANVAS for ordering your online textbook and connecting the material to CANVAS. Other supplemental materials will be included in the Module folders on Canvas. Students will also need to have access to Microsoft Excel for data analysis assignments.

Business Statistics: communicating with numbers, 5th edition
By Sanjiv Jaggia and Alison Kelly
ISBN13: 9781265035983
Copyright: 2025

Optional resource (useful after the course when you no longer have the textbook)

This is a suggested book that covers many of the same concepts in the textbook and the only fee is an optional contribution.

OpenIntro Statistics: https://www.openintro.org/book/os/

Course Description

This course provides an overview of quantitative methods essential for analyzing data, with hands-on application that focuses on business/industry applications designed to understand the relationships among variables and help solve problems. Topics include the exploratory data analysis framework, descriptive statistics, data visualization, basic probability models needed for statistical analysis, sampling methods and distributions, parameter estimation, interval estimation, hypothesis testing, Chi-Square tests, analysis of variance (ANOVA) and linear regression models. Standard and open-source statistical packages will be used to apply techniques to real-world problems.

Course Structure

This is an 8-week 100% online course. I will schedule a virtual class meeting most weeks using Zoom in Canvas, on Monday evenings from 6:30-8:00. Any weeks we do not meet virtually, I will pre-record the instruction and post in Canvas. Participation in the weekly meeting is optional, but you are encouraged to attend. All virtual class meetings will be recorded and made available to the class. Additionally, the course has prerecorded lessons if students want to work at their own pace.

Course Objectives

By the end of the course, students should be able to:

1. Perform exploratory data analysis using descriptive statistics to interpret data
2. Be able to select appropriate probability distributions and use them in an analytic context
3. Choose and apply the most convenient sampling methods
4. Formulate and test hypotheses
5. Construct and interpret confidence intervals
6. Develop skills to analyze data using ANOVA and linear regression

Course Topics

1. Review of fundamentals of exploratory data analysis
2. Data visualization
3. Review of probability models
4. Application of probability models to parameter estimation
5. Testing hypotheses
6. Statistical Inference
7. Chi-square tests
8. ANOVA
9. Simple and multiple linear regression

Teaching Philosophy

It is my goal to help you master the curriculum so you can then apply that knowledge to your future personal and professional analytics endeavors. I hope to create a learning environment in which students feel respected, are engaged in the activities, and share their questions, experiences, and ideas with me and the other students. I expect each student to work at their full capacity, respect others, and participate so that their experiences can add to the overall learning experience.

Course Technology & Skills

Student Academic Support Services

Links to all these services can be found on the Online Student Resources tab within the CanvasHelp function.

- Academic Resource Center: buy textbooks and supplies, access academic catalogs and programs, register for classes, and more.
- Center for Student Rights and Responsibilities: provides Code of Student Conduct along with other useful links.
- Office of Disability Accommodation: ODA exist to prevent discrimination on the basis of disability and to help students reach a higher level of independence. https://disability.unt.edu/
- Counseling and Testing Services: CTS provides counseling services to the UNT community as well as testing services; such as admissions testing, computer-based testing, career testing and other tests. http://studentaffairs.unt.edu/counseling-and-testing-services
- UNT Libraries: online library services https://library.unt.edu/services/
- Online Tutoring: chat in real time, mark up your paper using drawing tools and edit the text of your paper with the tutor's help.
- The Learning Center Support Programs: various program links provided to enhance the student experience. https://learningcenter.unt.edu/
- Supplemental Instruction: program for every student, not just for students that are struggling.
- UNT Writing Lab: offers free writing tutoring to all UNT students, undergraduate and graduate. http://writingcenter.unt.edu/
- Math Tutor Lab: http://math.unt.edu/mathlab/
- Succeed at UNT: how to be a successful student information. https://success.unt.edu/

The following information is provided to assist you in preparation for the technological aspect of the course.

o   UIT Help Desk: http://it.unt.edu/help-desk-resources-students

o   Browser requirements: You need a browser that interfaces well with Canvas, such as Microsoft Edge, Google Chrome, or Mozilla Firefox.
https://clear.unt.edu/supported-technologies/canvas/requirements

o   Word Processor: Creating and submitting files in Microsoft Office, the standard software for this course.

Canvas Technical Requirements / Assistance

Access and Log in Information

This course was developed and will be facilitated utilizing the CANVAS Learning Management System. CANVAS opens on the first day of the 8-week period. To get started with the course, please go to:
https://unt.instructure.com/login/ldap

You can access student guides on Canvas at this site. You will need your EUID and password to log in to the course. If you do not know your EUID or have forgotten your password, please go to:
https://ams.unt.edu/

The Canvas Student app has a mobile version of Canvas that helps students stay current with their courses anywhere. Download the Canvas Student app on Android and iOS devices.

For iOS devices, see:

How do I download the Canvas Student app on my iOS device?
https://community.canvaslms.com/docs/DOC-9831-18561185379

For Android devices, see: How do I download the Canvas Student app on my Android device?
https://community.canvaslms.com/docs/DOC-9758-18555199445

Minimum Technology Requirements
To be successful in this course, you will need the following:

- Computer
- Reliable internet access
- Speakers/microphone/camera
- Microsoft Office Suite with current version of Excel
- Statistical Software (SAS/R/Python – Optional)
- Canvas Technical Requirements
  (https://clear.unt.edu/supportedtechnologies/canvas/requirements)

Computer Skills & Digital Literacy

This course utilizes Excel (or SAS/R/Python) to perform analytics techniques with curriculum delivered on our Canvas learning management system platform. You should be able to successfully:

- Use Canvas including uploading and downloading files and posting to discussion boards
- Send email with attachments
- Download and install software
- Use spreadsheet programs
- Use presentation and graphics programs

Technical Assistance

Part of working in the online environment involves dealing with the inconveniences and frustration that can arise when technology breaks down or does not perform as expected. Here at UNT we have a Student Help Desk that you can contact for help with Canvas or other technology issues.

UIT Help Desk: UIT Student Help Desk site (http://www.unt.edu/helpdesk/index.htm)
Email: helpdesk@unt.edu   Phone: 940-565-2324
In Person: Sage Hall, Room 130
Walk-In   Availability: 8am-9pm
Telephone Availability:
- Sunday: noon-midnight
- Monday-Thursday: 8am-midnight
- Friday: 8am-8pm
- Saturday: 9am-5pm

Laptop Checkout: 8am-7pm

For additional support, visit Canvas Technical Help
(https://community.canvaslms.com/docs/DOC-10554-4212710328)

Netiquette

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. This includes but is not limited to comments made on discussion boards or other unacceptable communications between students in an online or blended learning environment. Inappropriate behaviors will be handled based upon the UNT Student Conduct and Discipline Policy which can be found at deanofstudents.unt.edu/conduct.

For those students that are new to online learning or assignments on a Learning Management System like Canvas, you may find these guidelines developed by Albion and Seth T. Ross to be very helpful.

"The Core Rules of Netiquette": http://www.albion.com/netiquette/corerules.html.

Course Requirements

Your final grade will be determined based on weekly assignments, projects, and class participation according to the table below. The total number of points received will be divided by the total possible number of points.

Assignments	Points Possible	Percentage of Final Grade
Class Participation: 4 discussion board assignments @ 30 points each	120 points	12%
Quizzes: 6 weekly quizzes @ 24 points each (drop lowest score)	120 points	12%
Labs: 6 weekly homework assignments @ 50 points each	300 points	30%
ANOVA Project @ 120 points	120 points	12%
Final Exam @ 240 points Standard Final Exam @ 100 points	340 points	34%
Total Points Possible	1000 points	100%

Grading

Course grades will be assigned based on earning the following points based upon a standard 10-point grading scale:

A = 895-1000
B = 795-894
C = 695-794
D = 595-694
F = 0-594

Course Assignment, Examination, and or Project Policies

ANOVA Project (120 points)
There is a project covering Analysis of Variance in Module 6. The ANOVA project will be to generate insight from a data set and prepare a report based on the insight. The project will use the techniques learned during the Module 6 lesson on a real data set. You should complete the project independently and are subject to the UNT honor code and conduct policies/actions.

Final Exams (340 points)
The final exam will cover all course objectives from Modules 1-7 and will be due the Thursday of Finals week. The final exam is in two parts so make sure to take both parts of the exam on Canvas. The final exam is to be taken independently and is subject to the UNT honor code and conduct policies/actions.

Discussion Boards (30 points each)
There will be four discussion board assignments. Each discussion board forum will focus on a question related to the textbook reading or supplemental readings that will be posted to Canvas. To earn full points

on discussion boards, students must be actively engaged in the group discussion and provide input to each of the assigned questions. Your initial input will earn you 25 points and responding to at least one other peer will earn you the remaining 5 points. As graduate students, it is expected that your responses be thoughtful, respectful, grammatically correct, and show your understanding of the topic being discussed.

Module Quizzes (24 points each)
There will be six (6) quizzes given during the course that are related to material covered in the chapters. Quizzes may only be taken once but your lowest quiz score of the six will be dropped. The quizzes will be multiple choice questions designed to reinforce the textbook content. Quizzes need to be completed by the due date as indicated on the course schedule. Times listed are Central Standard Time.

Labs/Homework Assignments (50 points each)
There will be six (6) homework assignments given during the course that are related to material covered in the chapters. Homework may only be attempted once and all of your homework scores will count towards your final grade. Assignments will typically include the concepts learned during the week applied on a real data set.

Course Calendar

Week	Topic / Required Reading	Assignments
Week 1 **Class:** **8/18/25**	*Course overview and Syllabus review* ***Module 1 –Introduction to Data Analytics and Descriptive Statistics*** *Chapter 1: Data and Data Preparation* *Chapter 2: Data Visualization* *Chapter 3: Summary Measures*	 <u>Due Aug 24th @ 11:59 pm, CST</u> *Complete Module 1 Discussion Board* *Take Module 1 quiz* *Complete Module 1 homework application*
Week 2 **Class:** **Recording Only**	***Module 2 – Probability and Probability Distributions*** *Chapter 4: Introduction to Probability* *Chapter 5: Discrete Probability Functions* *Chapter 6: Continuous Probability Functions*	 <u>Due Aug 31st @ 11:59 pm, CST</u> *Take Module 2 quiz* *Complete Module 2 homework application*

Week	Topic / Required Reading	Assignments
Week 3 **Class: Labor Day Holiday: Recording Only**	**Module 3 – Sampling and Interval Estimation** *Chapter 7: Sampling and Sampling Distributions* *Chapter 8: Interval Estimation*	Due Sep 7th @ 11:59 pm, CST *Complete Module 3 Discussion Board* *Take Module 3 quiz* *Complete Module 3 homework application*
Week 4 **Class: 9/8/25**	**Module 4 – Hypothesis Testing and Inference** *Chapter 9: Hypothesis Testing* *Chapter 10: Statistical Inference Concerning Two Populations*	Due Sep 14th @ 11:59 pm, CST *Take Module 4 quiz* *Complete Module 4 homework application*
Week 5 **Class: 9/15/25**	**Module 5 – Inference and Chi-square Tests** *Chapter 11: Statistical Inference Concerning Variance* *Chapter 12: Chi-square Tests*	Due Sep 21st @ 11:59 pm, CST *Complete Module 5 Discussion Board* *Take Module 5 quiz* *Complete Module 5 homework application*
Week 6 **Class: 9/22/25**	**Module 6 – ANOVA and Regression** *Chapter 13: Analysis of Variance* *Chapter 14: Correlation and Regression*	Due Sep 28th @ 11:59 pm, CST *Complete Module 6 Discussion Board* *Complete Module 6 Anova project*
Week 7 **Class: 9/29/25**	**Module 7 – Advanced Regression Topics** *Chapter 15: Inference with Regression Models* *Chapter 16: More Topics In Regression Analysis* *Chapter 17: Logistic Regression*	Due Oct 5th @ 11:59 pm, CST *Take Module 7 quiz* *Complete Module 7 homework application*

Week	Topic / Required Reading	Assignments
Week 8 **No Class**	**Module 8 – Final Exam (2 parts)**	<u>Due Oct 9th @ 11:59 pm, CST</u> *Complete Final Exam (2 parts)*

Course Evaluation

Student Perceptions of Teaching (SPOT) is the student evaluation system for UNT and allows students the ability to confidentially provide constructive feedback to their instructor and department to improve the quality of student experiences in the course.

Course Policies

Class Participation

Students are required to login regularly to the online class site. The instructor will use the tracking feature in Canvas to monitor student activity. Students are also required to participate in all class activities such as discussion board, chat or conference sessions and projects.

Late Work

All work for this course is due no later than 11:59 pm CST on the designated due date. Any assignment submitted after that time will receive a highest possible score of 80%. Additional points may be deducted when the assignment is graded based on the quality of the work submitted. Please don't lose valuable points this semester by turning in work late. If you have a circumstance that requires additional time to complete an assignment, let me know as soon as possible and we will work out a suitable extension.

The University is committed to providing a reliable online course system to all users. However, in the event of any unexpected server outage or any unusual technical difficulty which prevents students from completing a time sensitive assessment activity, the instructor will extend the time windows and provide an appropriate accommodation based on the situation. Students should immediately report any problems to the instructor and contact the UNT Student Help Desk: helpdesk@unt.edu or 940.565.2324 and obtain a ticket number. The instructor and the UNT Student Help Desk will work with the student to resolve any issues at the earliest possible time

Assignment Policy

Assignments are open book but must be completed without the assistance of peers or others that have knowledge of the course content. Students that engage in academic dishonesty will suffer the consequences per department guidelines. Assignment due dates are posted in the syllabus and on Canvas. Any changes to due dates will be updated on Canvas and communicated in an announcement. For assignments that require you to upload your work, you must submit your files in one of the following formats: .docx, .xlsx, .pdf, or .pptx unless other formats are requested. Do not submit .pages files.

TurnitIn will be utilized an all formal written assignments. All works submitted for credit must be original works created by the scholar uniquely for the class. It is considered inappropriate and unethical, particularly at the graduate level, to make duplicate submissions of a single work for credit in multiple

classes, unless specifically requested by the instructor. Work submitted at the graduate level is expected to demonstrate higher-order thinking skills and be of significantly higher quality than work produced at the undergraduate level. Turnitin is used as a tool to assist students in their scholarly writing to address plagiarism issues. It is recommended that students use this resource to ensure their work is free of copyright issues prior to final submission of their projects.

Instructor Responsibilities and Feedback

- As the instructor, it is my responsibility to help students grow and learn; provide clear instructions for projects and assessments, answer questions about assignments, identify additional resources as necessary, provide rubrics, and continually review and update course content based upon learning outcomes and changes in the field of study.

- Feedback on assignments will be provided in a timely manner. Students can expect responses to emails within 24 hours. Grades for weekly assignments will be posted the following week.

Syllabus Change Policy

While the plan is to follow this syllabus as written, it is not unreasonable to expect that adjustments will be made if necessary due to events that outside of my control. Any changes will be posted in the announcement section of our Canvas course. If these changes impact assignments or due dates, they will be communicated via email as well.

Student Use of Artificial Intelligence (AI)

AI tools cannot be used for completing any assignment in this class except for the final project. On the final project, AI tools may only be used if documented and only for the purpose of improving your written narrative. Violating course policies on AI usage is considered an academic integrity violation.

UNT Policies

Student Conduct and Discipline

You are encouraged to become familiar with the University's Code of Student Conduct found on the Dean of Students website. The policies contained on this website apply to this course.

The UNT Code of Student Conduct can be found at http://deanofstudents.unt.edu/conduct

Academic Integrity

The University of North Texas promotes the integrity of learning and embraces the core values of trust and honesty. Academic integrity is based on educational principles and procedures that protect the rights of all participants in the educational process and validate the legitimacy of degrees awarded by the University. In the investigation and resolution of allegations of student academic dishonesty, the University's actions are intended to be corrective, educationally sound, fundamentally fair, and based on reliable evidence. Instructors have primary responsibility for academic assessment. A finding by an instructor that academic dishonesty occurred may be considered grounds for academic penalties, up to and including failure in the course. Decisions about the degree of academic penalty to impose will be based on the seriousness of the violation. Instructors are expected to report all allegations, factual summary statements, and sanctions involving instances of academic misconduct.

The UNT Student Academic Integrity Policy is found at https://policy.unt.edu/policy/06-003

ADTA students must read and adhere to the university, department, and course Academic Integrity expectations. The consequences of violating Academic Integrity expectations are outlined below.

Advanced Data Analytics Integrity Policy

	Penalty	Other
1st Academic Integrity Offense	The minimum penalty is a 0 for the assignment AND a deduction of one letter grade from the final grade for the course. Other penalties may be assessed by the course instructor up to course failure, depending on the severity of the offense.	All Academic Integrity offenses will be reported to the UNT Academic Integrity Office.
2nd Academic Integrity Offense	Suspension from the ADTA program.	A second offense is defined as a separately reported offense either in the same class as the 1st offense or in a different course. Students suspended for a second Academic Integrity violation will not be allowed to enroll in ADTA courses for 1 calendar year. For students who had a single Academic Integrity violation prior to Fall 2023, a second violation will result in suspension from the ADTA program.
3rd Academic Integrity Offense	Dismissal from the ADTA program.	Students committing a 3rd Academic Integrity offense will be dismissed from the program. For students who had multiple Academic Integrity violations prior to Fall 2023, any additional violation will result in dismissal from the ADTA program.

ADA Policy

The University of North Texas makes reasonable academic accommodation for students with disabilities. Students seeking reasonable accommodation must first register with the Office of Disability Access (ODA) to verify their eligibility. If a disability is verified, the ODA will provide you with a reasonable accommodation letter to be delivered to faculty to begin a private discussion regarding your specific needs in a course. You may request reasonable accommodations at any time; however, ODA notices of reasonable 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 reasonable accommodation for every semester and must meet with each faculty member prior to implementation in each class.

Students are strongly encouraged to deliver letters of reasonable accommodation during faculty office hours or by appointment. Faculty members have the authority to ask students to discuss such letters during their designated office hours to protect the privacy of the student. For additional information, refer to the Office of Disability Access website (http://www.unt.edu/oda). You may also contact ODA by phone at (940) 565-4323.

Important Notice for F-1 Students taking Distance Education Courses

Federal Regulation

To read detailed Immigration and Customs Enforcement regulations for F-1 students taking online courses, please go to the Electronic Code of Federal Regulations website at http://ecfr.gpoaccess.gov. The specific portion concerning distance education courses is located at"Title 8 CFR 214.2 Paragraph (f)(6)(i)(G)" and can be found buried within this document: http://frwebgate.access.gpo.gov/cgi-bin/get-cfr.cgi?TITLE=8&PART=214&SECTION=2&TYPE=TEXT

The paragraph reads:
(G) For F–1 students enrolled in classes for credit or classroom hours, no more than the equivalentof one class or three credits per session, term, semester, trimester, or quarter may be counted toward the full course of study requirement if the class is taken on-line or through distance education and does not require the student's physical attendance for classes, examination or other purposes integral to completion of the class. An on-line or distance education course is a course that is offered principally through the use of television, audio, or computer transmission including open broadcast, closed circuit, cable, microwave, or satellite, audio conferencing, or computer conferencing. If the F–1 student's course of study is in a language study program, no on-line or distance education classes may be considered to count toward a student's full course of study requirement.

University of North Texas Compliance

To comply with immigration regulations, an F-1 visa holder within the United States may need to engage in an on-campus experiential component for this course. This component (which must be approved in advance by the instructor) can include activities such as taking an on-campus exam, participating in an on-campus lecture or lab activity, or other on-campus experience integral to the completion of this course.

If such an on-campus activity is required, it is the student's responsibility to do the following:

(1) Submit a written request to the instructor for an on-campus experiential component withinone week of the start of the course.
(2) Ensure that the activity on campus takes place and the instructor documents it in writing with anotice sent to the International Student and Scholar Services Office. ISSS has a form available that you may use for this purpose.

Because the decision may have serious immigration consequences, if an F-1 student is unsure about his or her need to participate in an on-campus experiential component for this course, s/heshould contact the UNT International Student and Scholar Services Office (telephone 940-565- 2195 or email internationaladvising@unt.edu) to get clarification before the one-week deadline.