

INFO 5501 - 020, Spring 2023

Fundamentals of Data Analytics

Instructor Contact

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Communication: For questions and concerns about the course in general, please send me an email.

Course Description

This course introduces to the student basic mathematical knowledge of Data Science. It reviews and teaches essential concepts and skills in statistics, probability, and linear algebra which data science is built upon. These skills and knowledge enable students to understand data science literature and the principles behind data analytics tools and algorithms. Python Basics, Sympy, Numpy, Pandas, and application examples like Gradient Descent, Principle Component Analysis and dimensionality reduction, K-Means Clustering, and Linear Regression will be introduced.

Course Structure

The primary teaching mode will be lecture and discussion. All course material will be provided on canvas including lecture notes, useful links on the web, recommended references, time schedule, and contact information for faculty & TA.

Day & Time: Friday, 2:30 PM – 5:20 PM

Classroom Number: NTDP K110

Class Dates: Jan 17, 2023- May 12, 2023

Course Prerequisites

This course was created for learners who have taken/studied college algebra, basic calculus, and basic linear algebra, basic statistics, and probability.

Course Objectives

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

Master the core math concepts and obtain the basic math skills that data scientists must have before moving on to study more advanced or practical Data Science courses.

Materials

Required Textbook:

“Principles of Data Science”, By SinanOzdemir, Packt> Publishing Co., ISBN: 978-1-78588-791-8 Optional

Textbooks:

- Calculus, by Briggs, Cochran, and Gillett; Second Edition
- Linear Algebra and Its Applications, by David Lay, Edition 5
- Elementary Statistics by R. Johnson and P. Kuby, 11th edition,
- Intro. To Probability and its Application, By Scheaffer & Young, 3rd edition.
- Data Science from Scratch, by Joel Grus

Other Resources:

- Wikibooks
- Wikipedia / Wikiversity

- Stat Trek
- Programiz.com
- Python.org [Course Technology](#)

Technology Requirements:

- Respondus Lockdown Browser and webcam are required for quizzes
- [Canvas Technical Requirements](#)

(<https://clear.unt.edu/supportedtechnologies/canvas/requirements>)

Technical Assistance

UIT Help Desk: [UIT Student Help Desk site](http://www.unt.edu/helpdesk/index.htm) (<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 **Laptop Checkout:** 8am-7pm

For additional support, visit [Canvas Technical Help](#)

(<https://community.canvaslms.com/docs/DOC10554-4212710328>) [Course Requirements](#)

| Assignments, Quizzes, Attendance | Points Possible | Percentage of Final Grade |
|---|------------------------|----------------------------------|
| Assignment 1 | 100 points | 5% |
| Assignment 2 | 100 points | 5% |
| Assignment 3 | 100 points | 5% |
| Assignment 4 | 100 points | 5% |
| Quiz 1 | 100 points | 10% |
| Quiz 2 | 100 points | 10% |
| MidTerm | 100 points | 20% |
| Short Presentation | 100 points | 10% |
| Final Exam | 100 points | 25% |
| Attendance | 100 points | 5% |
| Total Possible points | 1300 points | 100% |

Grading

The UNT scale for grading is as follows:

A = 90-100%

B = 80-89%

C = 70-79%

D = 60-69%

F = 50% and below

Incomplete: A grade of Incomplete will not be given except with preapproval of the instructor and prior application and certification of an acceptable special circumstance. A student with an accumulative course grade less than a B does not qualify for an incomplete. Students who qualify for an "incomplete" grade are responsible for meeting with the instructor and discussing requirements for completing the course within the time frame set by the college.

Withdrawal: The UNT semester course schedule lists specific deadlines regarding withdrawal. A grade of Withdraw (W) or Withdraw-Failing (WF) will be given depending on a student's attendance record and grade earned.

Course Policies

Copyright Notice

Materials used in connection with this course may be subject to copyright protection. Materials may include, but are not limited to: documents, slides, images, audio, and video. Materials in this course Web site are only for the use of students enrolled in this course, for purposes associated with this course, and may not be retained for longer than the class term. Unauthorized retention, duplication, distribution, or modification of copyrighted materials is strictly prohibited by law. For more information, visit the [UNT Policy Office \(Links to an external site.\)](#) or [Copyright.gov \(Links to an external site.\)](#).

Attendance and Participation

Students are advised to attend each class meeting. Prior to the class meeting, please preview the assigned reading materials for the class. If you do not attend the class, you will miss the in-class exercises and activities.

Late Work

Late work will receive a grade with a 10% penalty (or 10 points out of 100) per day after the due date.

Examination

1. The quizzes are closed books and closed notes
2. There is no need for a calculator, so calculators are not allowed
3. Using a cell phone for any purpose during tests and exams is prohibited
4. Talking or discussing with others during the tests and exams is prohibited

| Week | Date of class (Month/Date) | Content |
|-------------|-----------------------------------|----------------------------------|
| 1 | 01/20 | Introduction Lesson 1 |
| 2 | 01/27 | Lesson 2 |
| 3 | 02/03 | Lesson 3 |
| 4 | 02/10 | Lesson 4 |
| 5 | 02/17 | Lesson 5 |
| 6 | 02/24 | Lesson 6 |
| 7 | 03/03 | Lesson 7 |
| 8 | 03/10 | Lesson 8 |
| 9 | 03/24 | Lesson 9 |
| 10 | 03/31 | Lesson 10 |
| 11 | 04/07 | Lesson 11 |
| 12 | 04/14 | Lesson 12 |
| 13 | 04/21 | Lesson 13 |
| 14 | 04/28 | Lesson 14 |
| 15 | 05/05 | Lesson 15 |
| 16 | 05/12 | Final Exam |

Academic Integrity Policy

Academic Integrity Standards and Consequences. 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. [Insert specific sanction or academic penalty for specific academic integrity violation.]

ADA Policy

UNT makes reasonable academic accommodations 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 \(https://disability.unt.edu/\)](https://disability.unt.edu/).

Prohibition of Discrimination, Harassment, and Retaliation (Policy 16.004)

The University of North Texas (UNT) prohibits discrimination and harassment because of race, color, national origin, religion, sex, sexual orientation, gender identity, gender expression, age, disability, genetic information, veteran status, or any other characteristic protected under applicable federal or state law in its application and admission processes; educational programs and activities; employment policies, procedures, and processes; and university facilities. The University takes active measures to prevent such conduct and investigates and takes remedial action when appropriate.

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 Canvas for contingency plans for covering course materials.

Retention of Student Records

Student records pertaining to this course is maintained in a secure location by the instructor of record. All records such as exams, answer sheets (with keys), and written papers submitted during the duration of the course are kept for at least one calendar year after course completion. Coursework completed via the Canvas online system, including grading information and comments, is also stored in a safe electronic environment for one year. Students have the right to view their individual records; however, information about students' records will not be divulged to other individuals without proper written consent. Students are encouraged to review the Public Information Policy and the Family Educational Rights and Privacy Act (FERPA) laws and the University's policy. See UNT Policy 10.10, Records Management and Retention for additional information.

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 classrooms, labs, discussion groups, field trips, etc. Visit UNT's [Code of Student Conduct \(https://deanofstudents.unt.edu/conduct\)](https://deanofstudents.unt.edu/conduct) to learn more.

Access to Information - Eagle Connect

Students' access point for business and academic services at UNT is located at: my.unt.edu. All official communication from the University will be delivered to a student's Eagle Connect account. For more information, please visit the website that explains Eagle Connect and how to forward e-mails to [Eagle Connect \(https://it.unt.edu/eagleconnect\)](https://it.unt.edu/eagleconnect).

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 [insert administration dates] 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](http://spot.unt.edu/) (<http://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, including sexual harassment sexual assault, domestic violence, dating violence, and stalking. Federal laws (Title IX and the Violence Against Women Act) and UNT policies prohibit discrimination on the basis of sex and therefore prohibit 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. UNT's Survivor Advocates can assist a student who has been impacted by violence by filing protective orders, completing crime victim's compensation applications, contacting professors for absences related to an assault, working with housing to facilitate a room change where appropriate, and connecting students to other resources available both on and off campus. The Survivor Advocates can be reached at SurvivorAdvocate@unt.edu or by calling the Dean of Students Office at 940-565- 2648. Additionally, alleged sexual misconduct can be non-confidentially reported to the Title IX Coordinator at oeo@unt.edu or at (940) 565 2759.

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](http://www.ecfr.gov/) (<http://www.ecfr.gov/>). The specific portion concerning distance education courses is located at Title 8 CFR 214.2 Paragraph (f)(6)(i)(G).

The paragraph reads:

(G) For F-1 students enrolled in classes for credit or classroom hours, no more than the equivalent of 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.

The 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 within one week of the start of the course.
- (2) Ensure that the activity on campus takes place and the instructor documents it in writing with a notice 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/he should 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.

Student Verification

UNT takes measures to protect the integrity of educational credentials awarded to students enrolled in distance education courses by verifying student identity, protecting student privacy, and notifying students of any special meeting times/locations or additional charges associated with student identity verification in distance education courses.

See [UNT Policy 07-002 Student Identity Verification, Privacy, and Notification and Distance Education Courses](https://policy.unt.edu/policy/07-002) (<https://policy.unt.edu/policy/07-002>).

Use of Student Work

A student owns the copyright for all work (e.g. software, photographs, reports, presentations, and email postings) he or she creates within a class, and the University is not entitled to use any student work without the student's permission unless all of the following criteria are met:

- The work is used only once.
- The work is not used in its entirety.
- Use of the work does not affect any potential profits from the work.
- The student is not identified.
- The work is identified as student work.

If the use of the work does not meet all of the above criteria, then the University office or department using the work must obtain the student's written permission.

Download the UNT System Permission, Waiver, and Release Form

Transmission and Recording of Student Images in Electronically-Delivered Courses

1. No permission is needed from a student for his or her image or voice to be transmitted live via videoconference or streaming media, but all students should be informed when courses are to be conducted using either method of delivery.
2. In the event an instructor records student presentations, he or she must obtain permission from the student using a signed release in order to use the recording for future classes in accordance with the Use of Student-Created Work guidelines above.

3. Instructors who video-record their class lectures with the intention of re-using some or all of the recordings for future class offerings must notify students on the course syllabus if students' images may appear on the video. Instructors are also advised to provide accommodation for students who do not wish to appear in class recordings.

Example: This course employs lecture capture technology to record class sessions. Students may occasionally appear on the video. The lecture recordings will be available to you for study purposes and may also be reused in future course offerings.

No notification is needed if only audio and slide capture is used or if the video only records the instructor's image. However, the instructor is encouraged to let students know the recordings will be available to them for study purposes.

[Class Recordings & Student Likenesses](#)

Synchronous (live) sessions in this course will/may be recorded for students enrolled in this class section to refer to throughout the semester. 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.

Academic Support & Student Services Student Support Services

Mental Health

UNT provides mental health resources to students to help ensure there are numerous outlets to turn to that wholeheartedly care for and are there for students in need, regardless of the nature of an issue or its severity. Listed below are several resources on campus that can support your academic success and mental well-being:

- [Student Health and Wellness Center](https://studentaffairs.unt.edu/student-health-andwellness-center) (https://studentaffairs.unt.edu/student-health-andwellness-center)
- [Counseling and Testing Services](https://studentaffairs.unt.edu/counseling-and-testing-services) (https://studentaffairs.unt.edu/counseling-and-testing-services)
- [UNT Care Team](https://studentaffairs.unt.edu/care) (https://studentaffairs.unt.edu/care)
- [UNT Psychiatric Services](https://studentaffairs.unt.edu/student-health-and-wellnesscenter/services/psychiatry) (https://studentaffairs.unt.edu/student-health-and-wellnesscenter/services/psychiatry)
- [Individual Counseling](https://studentaffairs.unt.edu/counseling-and-testing-services/services/individual-counseling) (https://studentaffairs.unt.edu/counseling-and-testing-services/services/individual-counseling)

Chosen Names

A chosen name is a name that a person goes by that may or may not match their legal name. If you have a chosen name that is different from your legal name and would like that to be used in class, please let the instructor know. Below is a list of resources for updating your chosen name at UNT.

- [UNT Records](#)
- [UNT ID Card](#)
- [UNT Email Address](#)
- [Legal Name](#)

**UNT eUIDs cannot be changed at this time. The collaborating offices are working on a process to make this option accessible to UNT community members.*

Pronouns

Pronouns (she/her, they/them, he/him, etc.) are a public way for people to address you, much like your name, and can be shared with a name when making an introduction, both virtually and in-person. Just as we ask and don't assume someone's name, we should also ask and not assume someone's pronouns.

You can [add your pronouns to your Canvas account](#) so that they follow your name when posting to discussion boards, submitting assignments, etc.

Below is a list of additional resources regarding pronouns and their usage:

o [What are pronouns and why are they important?](#) o [How do I use pronouns?](#) o [How do I share my pronouns?](#) o [How do I ask for another person's pronouns?](#) o [How do I correct myself or others when the wrong pronoun is used?](#)

Additional Student Support Services

- [Registrar](https://registrar.unt.edu/registration) (https://registrar.unt.edu/registration)
- [Financial Aid](https://financialaid.unt.edu/) (https://financialaid.unt.edu/)
- [Student Legal Services](https://studentaffairs.unt.edu/student-legal-services) (https://studentaffairs.unt.edu/student-legal-services)
- [Career Center](https://studentaffairs.unt.edu/career-center) (https://studentaffairs.unt.edu/career-center)
- [Multicultural Center](https://edo.unt.edu/multicultural-center) (https://edo.unt.edu/multicultural-center)
- [Counseling and Testing Services](https://studentaffairs.unt.edu/counseling-and-testing-services) (https://studentaffairs.unt.edu/counseling-and-testing-services)
- [Pride Alliance](https://edo.unt.edu/pridealliance) (https://edo.unt.edu/pridealliance)
- [UNT Food Pantry](https://deanofstudents.unt.edu/resources/food-pantry) (https://deanofstudents.unt.edu/resources/food-pantry)

Academic Support Services

- [Academic Resource Center](https://clear.unt.edu/canvas/student-resources) (https://clear.unt.edu/canvas/student-resources)
- [Academic Success Center](https://success.unt.edu/asc) (https://success.unt.edu/asc)
- [UNT Libraries](https://library.unt.edu/) (https://library.unt.edu/)
- [Writing Lab](http://writingcenter.unt.edu/) (http://writingcenter.unt.edu/)