# ADTA 5410-501

**Applications and Deployment of Advanced Analytics**

**Fall 2025**

A person working on a computer

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**Instructor Information**

## A person wearing glasses and a plaid shirt AI-generated content may be incorrect.I am Dr. Orhan Erdem, a faculty member in the Department of Advanced Data Analytics and Statistics at UNT. You can reach me at [orhan.erdem@unt.edu](mailto:orhan.erdem@unt.edu). Outside of work, I enjoy swimming, playing pickleball, and playing violin.

**Class Hours:** T 6-7:50 pm

**Office Hours:**

* **Online:** Schedule an [online meeting via Calendly here](https://calendly.com/orhan-erdem/orhan-online-office-hours) (M 9-11 am).
* **In-person:** T 4–6 pm in Frisco 228, and F 2:30-4:30 pm in Denton, GAB 102J.
* You can also arrange a different time if none of the above works for you by emailing me.

## Course Description, Structure, and Objectives

This course focuses on using advanced analytics in practical case studies to help students develop the skills needed to address complex challenges in industry and business. Students will select projects based on provided datasets, formulate insightful questions, and devise effective solutions that align with project goals. They will choose appropriate methods from various alternatives and implement relevant techniques and technologies in real-world scenarios. Emphasis is placed on mastering the deployment of analytics and improving professional communication skills.

## Course Prerequisites or Other Restrictions

Students should take the following core courses before sitting in this course: ADTA 5130 Data Analytics 1, ADTA 5230 Data Analytics 2, ADTA 5250 Large Data Visualization, ADTA 5240 Harvesting, Storing and Retrieving Data, and ADTA 5340 Discovery and Learning with Big Data. Please check the department website for the latest policy changes regarding the course prerequisite policies. To be successful in this course, you will need to:

* Learn how to code in the Python programming language.
* Cite sources, giving credit to where you obtain information.
* Commit to spend at least 15-20 hours a week reading the assigned chapters, working on programming assignments and quizzes, working on mini-group projects and reflecting on the material covered, and participating in other activities throughout the course.

## Learning Objectives

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

1. Evaluate various research and project methodologies, identifying their suitability for addressing complex problems in industry and business contexts.
2. Formulate clear, focused, and actionable questions that guide data-driven projects in professional/academic settings.
3. Conduct targeted literature and market analysis using academic and industry databases to identify relevant trends, findings, and best practices.
4. Design a practical and methodologically sound approach for analyzing real-world data in a business or academic context.
5. Draft a data collection plan for a research or applied project.
6. Apply appropriate data analysis techniques to the collected data (e.g., statistical analysis, coding for qualitative data).
7. Interpret data results and create visual representations (graphs, charts) to highlight key findings.
8. Structure a research paper by organizing the introduction, methods, results, and discussion sections. Present research findings clearly and effectively using PowerPoint or another presentation tool. Submit a final research project report that meets academic standards for clarity, structure, and content.

## Required/Recommended Materials

This course does not require a textbook; however, the following book is recommended:

[Research Methods for Business Students](https://www.pearson.com/en-us/subject-catalog/p/research-methods-for-business-students/P200000010080/9781292741581), Mark N. K. Saunders, Philip Lewis, Adrian Thornhill, 9th edition, Pearson (June 30, 2024).

The course has digital components. To fully participate in this class, students will need internet access to reference content on the Canvas Learning Management System, a webcam, and a microphone for presentation recordings. If circumstances change, you will be informed of other technical needs to access course content.  Information on how to be successful in a digital learning environment can be found at [Learn Anywhere](https://online.unt.edu/learn) (<https://online.unt.edu/learn>).

## Important Notice for F-1 Students taking Distance Education Courses

### Federal Regulation

Federal regulations state that students may apply only 3 fully online semester credit hours (SCH) to the hours required for full-time status for [F-1 Visa (DOC)](https://digitalstrategy.unt.edu/clear/files/clear_f1_online_student_procedures_rev2018_10_08.doc) holders. Full-time status for F-1 Visa students is 12 hours for undergraduates and 9 hours for graduate students. 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 in Title 8 CFR 214.2 Paragraph (f)(6)(i)(G).

## Communication & Office Hours

The preferred way to contact me is via email (not the Canvas email tool). While I have a workspace on campus, I encourage you to request a meeting time to ensure we have dedicated time in which I can answer your questions.

I encourage you to take advantage of office hours—not just when you're struggling, but also to refine ideas, plan ahead, or get feedback. Many students tell me they leave our meetings feeling more confident and clearer about their goals. Reaching out is not a sign of weakness; it’s one of the best ways to succeed.

Emails are usually answered within one business day. Please include the course name and section in your message and use professional etiquette. If you're asking about a specific assignment, include relevant files or screenshots to help me assist you more effectively

UNT strives to offer you a high-quality education and a supportive environment, so you learn and grow. As a faculty member, I am committed to helping you be successful as a student. To learn more about campus resources and information on how you can be successful at UNT, go to [unt.edu/success](https://www.unt.edu/success/) and explore [unt.edu/wellness](https://wellness.unt.edu/). To get all your enrollment and student financial-related questions answered, go to [scrappysays.unt.edu](http://scrappysays.unt.edu/).

## 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](https://studentaffairs.unt.edu/office-disability-access) website (<https://studentaffairs.unt.edu/office-disability-access>). You may also contact ODA by phone at (940) 565-4323.

## Course Requirements/Schedule

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| --- | --- |
| *Assignments* | *Percentage of Final Grade* |
| DataCamp | 20% |
| Homework | 40% |
| Written Submission of the Project | 20% |
| Recorded Presentation of the Project | 20% |
| Bonus (max 10% is possible) | 0% |
| Total Points Possible | 100% |

## Course Assignment Information

### DataCamp

To help gain hands-on experience in applying statistical learning techniques using Python, this course will include various Python DataCamp assignments. To earn full marks, you only need to finish the DataCamp module by the deadline. Note that in DataCamp, you may get the answers to the exercises, but try as many of the exercises so you get more practice in Python, and if you request the answer, review the code to understand the solution. Note that you must use the UNT e-mail address when registering to use the free 6-month subscription to DataCamp. Additionally, the certificate you submit must include your full name. The DataCamp modules are as follows:

* Introduction to Python (due: Sept 1)
* Intermediate Python (due: Sept 1)
* Visualizing Time Series Data in Python (due: Sept 15)
* Understanding Data Science (due: Sept 29)
* Exploratory Data Analysis in Python (due: Oct 13)
* Data Manipulation with Pandas (due: Oct 27)

If you have previously completed any of these courses, you have two options:

1. Retake the DataCamp course. The certificate must have a completion date of August 11, 2025, or later (certificates dated before August 11, 2025, will not be accepted).
2. Choose a different DataCamp course of similar duration that is not on this semester’s required list (see Canvas). Upload two certificates: the original course and the new one, with the new course completed on or after **August 11, 2025**.

### Homework

This course is mainly composed of running a semester-long project, which will have intermediary steps, which are going to be your assignments. There will be 5 assignments, out of which the lowest one will be dropped.

### Research Project

1. Written Submission: Students will submit a research paper. You can work in groups of up to 2 people. You are supposed to choose a topic, develop a research question related to your topic, and perform sound research. Be as clear and understandable as possible. Anybody without prior knowledge in the field who reads your project should be impressed by your work. The project can be performed in teams (Please see the Guide for the rubrics).
2. Presentation: Students must present their research findings in a video submission, limited to a maximum duration of 5 minutes. All group members must actively participate in the presentation, though there is no specific requirement for how time is allocated among participants (Please see the Guide for the rubrics).

### Bonus/ Extra Credit

In this class, there are several opportunities to earn extra credit:

* I often provide additional puzzles, and homework assignments, or pose questions to stimulate engagement. Participating in these activities can earn you extra points.
* Reporting any errors you find in Canvas materials, lecture notes, or videos is also rewarded. This is on a first-come, first-served basis, so I encourage you to stay proactive.
* Occasionally, there are short research projects or activities available for those who wish to volunteer. I will announce these opportunities as they arise.

Please try to interact as much as possible to take full advantage of these opportunities. Students will be notified by Eagle Alert if there is a campus closing that will impact a class and describe that the calendar is subject to change, citing the [Campus Closures Policy](https://policy.unt.edu/policy/15-006) (<https://policy.unt.edu/policy/15-006>).

## Assessing Your Work

The grading scale for this course will be determined by how many points you made out of your assignments.

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| --- | --- |
| Out of 100 | Letter Grade |
| [90%-100%] | A |
| [80%-90%) | B |
| [70%-80%) | C |
| [60%-70%) | D |
| [0-60%) | F |

The "[" symbol means the grade on the left side of the percentage is included. The ")" symbol means the grade on the right side of the percentage is not included.

Late Work

All work for this course is due no later than 11:59 pm on the designated date. **Any assignment submitted after that time will receive a 10% grade reduction for each day it is late.** Assignments handed in after answers are distributed will receive no credit.

## Course Calendar

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| Week/Date | Modules and Topics | Activities |
| *Module 1*  *(August 18-31)* | **Context**   * *Introduction to Python* * *Understanding the Context* * *Data Set Exploration* | * Review the syllabus * Complete DataCamp 1, 2 |
| *Module 2*  *(Sept 1-14)* | **Integrating and Visualizing Data**   * *Merging Data Sheets* * *Choosing the Best Visualization for Projects* | * Submit Homework 1 * Complete DataCamp 3 |
| *Module 3*  *(Sep 15-28)* | **Developing a Research Proposal**   * *Formulating Research Question* * *Designing a Strategy and Methodology* | * Submit Homework 2 * Complete DataCamp 4 |
| *Module 4*  *(Sep 29-Oct 12)* | **Crafting the Literature Review**   * *Purpose and Structure of Literature Reviews* * *Planning and Writing Your Literature Review* | * Submit Homework 3 * Complete DataCamp 5 |
| *Module 5*  *(Oct 13-26)* | **Building the Data Set of Your Research**   * *Selecting appropriate data sources* * *Cleaning and preparing the dataset* | * Read the assigned resources. |
| *Module 6*  *(Oct 27-Nov 9)* | **Choosing an Appropriate Methodology**   * *Choosing appropriate methods and models* * *Integrating All Components into a Draft* * *Feedback and Revision Planning* | * Read assigned papers * Submit Homework 4 * Complete DataCamp 6 |
| *Module 7*  *(Nov 10-23)* | **Finalizing the Written Part of the Research Project**   * *Refinement, Editing, and Reference Checking* * *Final Review* | - Read the assigned resources  - Project submission (written part) |
| *Module 8*  *(Nov 24-Dec 12)* | **Project Presentation**   * *Finalizing key findings and insights from your research* * *Designing and preparing presentation slides* * *Recording your presentation and submitting the video* | - Project presentation (video) |

## 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.

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**.

<https://policy.unt.edu/sites/default/files/06.003%20Student%20Academic%20Integrity_0.pdf>

### Advanced Data Analytics Integrity Policy

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|  | **Minor Assignment**  Ex. Discussion, HW, Journals | **Major Assignment**  Ex. Exam Mid term, projects |
| 1st occurrence | First written warning and report filed with Academic Integrity Office  Min. 30% deduction to loss of all points (grade of 0) | First written warning and report filed with Academic Integrity Office  Min. 30% deduction to loss of all points (grade of 0) and F in the class |
| 2nd occurrence | Second written warning and report filed with Academic Integrity Office  Min. 50% deduction up to loss of all points (grade of 0) | Second written warning and report filed with Academic Integrity Office  Min. 50% deduction up to loss of all points (grade of 0) and F in the class |
| 3rd occurrence | Written Letter and report filed with Academic Integrity Office  Min. 0 grade for that assignment and grade of F in the class | Written Letter and report filed with Academic Integrity Office  Min. 0 grade for that assignment and grade of F in the class |

## Artificial Intelligence Policy

AI tools may be used in a limited capacity to support learning in this course. All submissions must reflect the student’s understanding and effort.

Prohibited Uses:

* Submitting AI-generated work as your own without proper attribution.
* Using AI during exams or generating full assignments without approval.

Guidelines:

If AI significantly contributes to your work, disclose its use (e.g., "This section was assisted by [Tool Name]").

Review and refine AI outputs to ensure accuracy and originality.

Misuse of AI may violate academic integrity policies and result in disciplinary action. For questions, consult the instructor.

## Attendance and Participation

This class meets once a week, and every class meeting is essential to your success. Research has shown that students who attend class are more likely to be successful. You should attend every class unless you have a university-excused absence such as active military service, a religious holy day. However, attendance is not required. It is important that you communicate with the professor prior to being absent so you and the professor can discuss and mitigate the impact of the absence on your attainment of course learning goals. You are responsible for reading course announcements and keeping up with assignments as posted in the course syllabus. It is always recommended that you attend scheduled virtual class meetings.