# MATH 3680.004 (Fall 2025): Applied Statistics face-to-face Syllabus

## Instructor Information

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**Course Meets:** MWF 8:00-8:50am, Wooten Hall, Room 112

**Office Hours:** By appointment and

* Monday7:00am-8:00am Wooten Hall Room 117
* Wednesday7:00am-8:00am Wooten Hall Room 117
* Wednesday 3:30-5:30pm General Academic Building Room 113
* Friday7:00am-8:00am Wooten Hall Room 117

## Hello! I am a Clinical Assistant Professor in the Data Analytics Department. I have taught at UNT for two years. Please call me Dr. Penn. I received my Doctor of Management from University of Maryland University College and an MBA from Frostburg State University along with two bachelor’s degrees from the University of Texas at Arlington. I have over thirty years of experience in information technology, project management, and data analytics.

## How to Communicate with Your Instructor

1. If you have a question about a **specific WebAssign homework problem**, click “**Ask Your Teacher**” near the top of the page and follow the prompts. This will allow me to see both your message and your previous attempts to solve the problem.
2. If you have a general question about the course material, please send me a Canvas message or an email with “**MATH 3680.XXX**” in the subject line. *To protect your privacy, I will only reply to emails sent from your UNT account.*
3. If you would like to schedule a Zoom appointment, please submit your request at least 24 hours in advance by E-mail.

I will check my messages every day (**except weekends and holidays**) and will make every effort to respond within 24 hours.

## Course Description

3 hours, Descriptive statistics, elements of probability, random variables, confidence intervals, hypothesis testing, regression, contingency tables.

## Course Structure

This is a 15-week, face-to-face course designed for STEM majors and serves as a foundational, calculus-based probability and statistics class. Students are expected to attend all lectures, read assigned sections from the eBook (available through WebAssign), and complete corresponding homework assignments in WebAssign. The course includes three midterm exams and a comprehensive final exam.

## Course Prerequisites

MATH 1710 and MATH 1720 (may be taken concurrently). Students should have mastered differential and integral calculus of a single variable, including integration by parts.

## Course Objectives

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

* Examine how to make intelligent judgments and informed decisions in the presence of uncertainty and variation.
* Investigate randomness and uncertainty.
* Develop probability models for a single discrete/continuous random variable.
* Examine confidence intervals and hypothesis-testing procedures for single data set.
* Examine confidence intervals and hypothesis-testing procedures for two sets of paired/unpaired data.
* Analyze if two variables are related and how strong that relationship is.

## How to Succeed in this Face-to-Face Course

The best way to ensure you pass this course is to work consistently throughout the semester. In mathematics courses topics always build one upon the other making it very difficult to catch up later if you fall behind. To master the course material, you must exert consistent effort throughout the semester:

* **Read the relevant textbook section before each lecture.** This will help you identify what topics you need to focus on and what questions to ask during class.
* **Begin each homework assignment as soon as possible after the corresponding lecture.** Starting early reinforces your understanding while the material is still fresh.
* **When preparing for exams, make a genuine effort to solve all review problems on your own before watching the video solutions.** This strengthens your problem.

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/).

There are many academic resources available to help you succeed in this course:

* [Navigate’s Study Buddy](https://navigate.unt.edu) (https://navigate.unt.edu)
* [Math Lab](https://math.unt.edu/mathlab) (https://math.unt.edu/mathlab)
* [UNT Learning Center](https://learningcenter.unt.edu/) (https://learningcenter.unt.edu/)
  + [Tutoring](https://learningcenter.unt.edu/tutoring) (<https://learningcenter.unt.edu/tutoring>)

### ADA Accommodation Statement

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](https://studentaffairs.unt.edu/office-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 accommodation 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.

## Creating an Inclusive Learning Environment

Every student in this class should have the right to learn and engage within an environment of respect and courtesy from others. We will discuss our classroom’s habits of engagement and I also encourage you to review UNT’s student code of conduct so that we can all start with the same baseline civility understanding ([Code of Student Conduct](https://policy.unt.edu/policy/07-012)) (<https://policy.unt.edu/policy/07-012>).

## Required Course Materials

This course has digital components. To fully participate in this class, students will need internet access to reference content on the [Canvas Learning Management System](https://clear.unt.edu/supported-technologies/canvas/requirements) (https://clear.unt.edu/supported-technologies/canvas/requirements).

Students will be expected to bring to class (including exams) a graphing calculator with statistical functions or a laptop computer with a spreadsheet or statistical analysis program installed. I will demonstrate how to perform various statistical functions using a TI-83/84 Plus or [Microsoft Excel](https://it.unt.edu/installoffice365) (https://aits.unt.edu/support/office365apps).

**Textbook (Required):** Devore, Jay L. *Probability and Statistics for Engineering and the Sciences*, 9th edition. Cengage, 2016.

* WebAssign (6 months = $128.75)
* Cengage Unlimited (4 months = $139.99, 1 year = $214.99)

**Cengage WebAssign Required:** WebAssign is an online delivery platform accessed directly through Canvas. WebAssign access includes all online homework assignments, the e-textbook and additional learning resources. **Use the link in Canvas to register immediately.** You must register in WebAssign by the 2nd class day of the semester.

**Lecture Notes (Recommended):** A PDF version of the PowerPoint slides can be downloaded from Canvas and printed prior to class. Pre-printed, spiral-bound copies can be purchased for $24.18 plus tax at the University Services Building, M–F 8:00 am–5:00 pm.

## What You Should Do Immediately

Log in to Canvas and click the WebAssign link at the top of the module page. Please use **your UNT E-mail address** to register for this course. See [Video Tutorial: Access WebAssign from Canvas](https://www.webassign.net/manual/student_guide/t_s_vt_canvas.htm) for more information. WebAssign grants **no-cost temporary 14-day access**. You must purchase your access before the temporary access expires. Students who do not purchase WebAssign by the end of the temporary access period may lose credit for all work previously completed with the possibility of no refund.

I strongly encourage you to get started with Enhanced WebAssign as soon as possible. If you delay, you run the risk of unforeseen technical problems that could prevent you from completing the first assignment.

### Course Topics

The following chapters and sections of the textbook will be covered according to the projected schedule below. Dates may change as events warrant.

Chapter 1: Overview and Description Statistics

1.1 Populations, Samples and Processes

1.2 Pictorial and Tabular Methods in Descriptive Statistics

1.3 Measures of Location

1.4 Measures of Variability

Chapter 2: Probability

2.1 Sample Spaces and Events

2.2 Axioms, Interpretations, and Properties of Probability

2.4 Conditional Probability

2.5 Independence

Chapter 3: Discrete Random Variables and Probability Distributions

3.1 Random Variables

3.2 Probability Distributions for Random Variables

3.3 Expected Values

3.4 The Binomial Probability Distribution

3.5 Hypergeometric and Negative Binomial Distributions

Chapter 4: Continuous Random Variables of Probability Distributions

4.1 Probability Density Functions

4.2 Cumulative Distribution Functions and Expected Values

4.3 The Normal Distribution

4.6 Probability Plots

Chapter 5: Joint Probability Distributions and Random Samples

5.4 The Distribution of the Sample Mean

5.5 The Distribution of a Linear Combination

Chapter 7: Statistical Intervals Based on a Single Sample

7.1 Basic Properties of Confidence Intervals

7.2 Large-Sample Confidence Intervals for a Population Mean and Proportion

* 1. Intervals Based on Normal Population Distribution

Chapter 8: Test of Hypotheses Based on a Single Sample

8.1 Hypotheses and Test Procedures

8.2 *z-*Tests for Hypotheses about a Population Mean

8.3 The One-Sample *t* Test

8.4: Tests Concerning a Population Proportion

Chapter 9: Inferences Based on Two Samples

9.1 *z* Tests and Confidence Intervals for a Difference Between Two Population Means

9.2 The Two Sample *t* Test and Confidence Interval

9.3 Analysis of Paired Data

9.4 Inferences Concerning a Difference Between Population Proportions

Chapter 12: Simple Linear Regression and Correlation

12.1: The Simple Linear Regression Model

12.2: Estimating Model Parameters

12.5 Correlation

## Tentative Face-to-Face Course Schedule

|  |  |  |  |
| --- | --- | --- | --- |
| **Date** | **Lecture/Assignment** | **Sections** | **Topic** |
| **Week 1** | | | |
| 8/18 | Lecture 1 | 1.2, 1.3, 1.4 | Graphical Representation of Data |
| 8/20 | Lecture 2 | 1.3, 1.4 | Mean and Standard Deviation |
| 8/22 | **Homework 0** |  |  |
| **Week 2** | | | |
| 8/25 | Lecture 3 | 2.2, 2.4 | Probability: Axioms and Multiplication Rule |
| 8/27 | Lecture 4 | 2.2, 2.5 | Probability: Independence and Addition Rule |
| 8/29 | **Homework 1** | 1.2-1.4 |  |
| **Week 3** | | | |
| **9/1/2025** | **Labors Day (No class)** |  |  |
| 9/3 | Lecture 5 | 3.1, 3.2, 3.3 | Discrete Random Variables and Probability Distributions |
| 9/5 | **Homework 2** | 2.2, 2.4 and 2.5 |  |
| **Week 4** | | | |
| 9/8 | Lecture 6 | 3.4, 3.5 | Binomial and Hypergeometric Distribution |
| 9/10 | Lecture 7 | 4.1, 4.2 | Continuous Random Variables |
| 9/12 | **Homework 3** | 3.1- 3.5 |  |
| **Week 5** | | | |
| 9/15 | Lecture 8 | 4.3 | The Normal Distribution |
| 9/17 | **Homework 4** | **Review for Calculus I** |  |
| **9/19** | **Exam 1** | **Chapter 1-3** | **(Lecture 1–6)** |
| **Week 6** | | | |
| 9/22 | Lecture 9 | 4.3, 5.4 | Approximating Bin(n, p) with the Normal Distribution |
| 9/24 | Lecture 10 | 4.6, 5.5 | Probability Plots and Linear Combinations of Random Variables |
| 9/26 | **Homework 5** | 4.1, 4.2, 4.3 |  |
| **Week 7** | | | |
| 9/29 | Lecture 11 | 5.4 | The Central Limit Theorem |
| 10/1 | Lecture 12 | 7.1, 7.2 | Confidence Intervals: Large samples or known σ |
| 10/3 | **Homework 6** | 4.6, 5.4 and 5.5 |  |
| **Week 8** | | | |
| 10/6 | Lecture 13 | 7.2 | Confidence Intervals: One-Sided for Means and Two-Sided for Proportions |
| 10/8 | Lecture 14 | 7.3 | Confidence Intervals and Prediction Intervals: Small Samples |
| 10/10 | **Homework 7** | 7.1, 7.2 |  |
| **Week 9** | | | |
| 10/13 | Lecture 15 | 8.1 | Introduction to Hypothesis Testing |
| 10/15 | **Homework 8** | 7.3, 8.1 |  |
| **10/17** | **Exam 2** | **Chapter 4-7** | **(Lecture 7–14)** |
| **Week 10** | | | |
| 10/20 | Lecture 16, 17 | 8.2 | Hypothesis Testing: The z-Test and t-Test |
| 10/22 | Lecture 18 (and 19) | 8.3 | Hypothesis Testing: P-value Test and Proportions |
| 10/24 | **Homework 9** | 8.2, 8.3 |  |
| **Week 11** | | | |
| 10/27 | Lecture 20 | 9.1 | Two-Sample Data: Unpaired Large Samples |
| 10/29 | Lecture 21 | 9.2, 9.3, 9.4 | Two-Sample Data: Unpaired Small Samples  and Proportions |
| 10/31 | **Homework 10** | 9.1, 9.2 |  |
| **Week 12** | | | |
| 11/3 | Lecture 21 | 9.2, 9.3, 9.4 | Two-Sample Data: Paired Large Samples |
| 11/5 | **Homework 11** | 9.3, 9.4 |  |
| **Week 13** | | | |
| 11/10 | Lecture 22 | 12.5 | Correlation |
| 11/12 | **Homework 12** | 12.5 |  |
| 11/14 | **Exam 3** | **Chapter 8-9** | **(Lecture 15–21)** |
| **Week 14** | | | |
| 11/17 | Lecture 23 | 12.1, 12.2 | Linear Regression |
| 11/19 | **Homework 13** | 12.1, 12.2 |  |
| **11/24/2025-11/30/2025: Thanksgiving Break (No class)** | | | |
| **Week 15 (Pre Final week)** | | | |
|  | Review |  |  |
| **Final Week (12/6-12/11)** | | | |
|  | **Comprehensive Final exam** |  |  |

## Emergency Notification & Procedures

UNT uses a system called [Eagle Alert](https://www.unt.edu/eaglealert.html) 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 the UNT Learning Management System (LMS) for contingency plans for covering course materials.

## Assessing Your Work

|  |  |
| --- | --- |
| WebAssign Homework | 25% |
| Three regular exams and Final exam | 75% |
| **Total** | **100%** |

## Grading

A = 90–100 % B = 80–89.9% C = 70–79.9% D = 60–69.9% F = below 60%

Grades are based on mastery of the content. As a rule, I do not grade on a “curve” because that is a comparison of your outcomes to others. I do, however, encourage you to find opportunities to learn with and through others. Please come to office hours or take advantage of the academic resources listed above if you find yourself struggling.

If you need to pass this course because it is your last semester, your financial aid depends on it, your scholarship depends on it, or your parent/guardian has threatened you in some manners then do yourself a favor and start studying right away. **I will not entertain any pleas for extra credit or offers to do additional work at the end of the semester.**

### Academic Integrity Standards and Consequences

According to UNT Policy 06.003, [Student Academic Integrity](https://policy.unt.edu/policy/06-003) (https://policy.unt.edu/policy/06-003), 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.

## Attendance and Participation

Students are expected to attend class regularly and engage with the material. Research has shown that students who attend class are more likely to be successful. If you miss class, you will be responsible for obtaining a copy of the notes and any other information discussed by a classmate. You should attend every class unless you have a university excused absence such as active military service, a religious holy day, or an official university function as stated in the [Student Attendance and Authorized Absences Policy (PDF)](https://policy.unt.edu/policy/06-039) (<https://policy.unt.edu/policy/06-039>). If you cannot attend a class due to an emergency, please let me know. Your safety and well-being are important to me. You may also provide documentation verifying the reason for your absence to the [Dean of Students](https://deanofstudents.unt.edu/) (<https://studentaffairs.unt.edu/dean-of-students>).

### Examination Policy

There will be 3 midterm exams, and a comprehensive final exam administered in person during lecture. There are NO remote/online options for exams. After the exam is graded, you have 48 hours to appeal your grade. I will not listen to any appeal after this 48-hour period. You may ask me to go over exam problems with you. However, all decisions on partial credit are final and not open for discussion.

**Your lowest exam score will drop.** If you are happy with your scores on the 3 midterms, then you may choose to omit the final exam.

**Make-up Policy:** Make up exams will NOT be given for any reason after the fact. I drop the lowest exam score to cover emergencies which may arise unexpectedly. An exam may be taken prior to the scheduled date if you have a conflict with another obligation and can provide documentation. I require notification a week in advance for this accommodation.

I reserve the right to test you on problems that are generalizations of material covered in the class and/or in the text. In short, the problems may not look exactly like the ones in the book. Everything that is covered in the course content is fair game for exam material. You will be responsible for everything unless I advise you to the contrary.

### Homework Policies

Homework assignments can be accessed via [WebAssign](http://www.webassign.net) (http://www.webassign.net).

* When you log in, you will be able to see the due dates.
* Cooperation on homework assignments is encouraged.
* You have **4 submissions** for most questions. Your last submission will count as your final answer.

If you use a help option (Read it, Watch it and Talk to a Tutor), it will count as 1 submission.

* You can save your work without using a submission.
* Some exercises will be randomized. In other words, it’s possible that every student will have slightly different questions with different answers.
* **A 5% bonus will be awarded** to students who complete their homework more than 48 hours before the due date.

When computing grades, I will **drop ONE lowest homework grade** before computing the homework average. Therefore, in principle, you could get a 100% homework score and not turn in an assignment during the semester. I have this policy in case you get sick, a family emergency arises, etc., during the semester. You will still be responsible for the material in such assignments during the examinations. **Requests for manual extensions will NOT be granted.**