# FALL 2025 MATH 4610.001 Probability

## Instructor Information

**Name:** Allen Mann

**Pronouns:** he/him/his

**Office Location:** GAB 432

**Student Support Hours:** By appointment and

* Monday @ 1:00-2:50 pm
* Thursday @ 9:30-10:50 am
* Friday @ 1:00-2:50 pm

**Email:** [allen.mann@unt.edu](mailto:allen.mann@unt.edu)

Hello! I am a Principal Lecturer in the Department of Mathematics. I have taught at UNT since 2015. Please call me Dr. Mann. I received my Ph.D. and M.A. in Mathematics from the University of Colorado at Boulder, and a B.A. in Mathematics and French cum laude from Albertson College of Idaho. I have travelled around the world, and I have lived in both France and Finland.

## How to Communicate with Your Instructor

Please reach out to me if you have questions, need help, or want to let me know about something that affects your engagement with the class. There are two ways to contact me outside of class.

* **Canvas:** For general inquiries, send me a message using [Canvas](https://techsupport.unt.edu/students).
* **Email:** You may also send me an email with “MATH 4610.001” in the subject line from your [UNT email account](https://techsupport.unt.edu/students).

You may expect a response within two business days. If you do not hear from me within that timeframe, feel free to send a reminder.

## Course Description

Combinatorial analysis, probability, conditional probability, independence, random variables, expectation, parameterized distributions, limit theorems, joint distributions, conditional distributions, and correlation. Emphasis will be placed on the key concepts and methods widely used in statistics. **Prerequisites:** MATH 2730 and either MATH 3680 or consent of department.

This is a 15-week, face-to-face course that will cover selected topics from Chapter 1-6. There will be three mid-term exams and a comprehensive final exam.

## Learning Objectives

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

* Understand the basic concepts of probability, random variables, and joint distributions
* Compute probabilities of compound events
* Apply Bayes’ theorem appropriately
* Compute expectation and variance
* Master commonly used discrete and continuous distributions
* Find the joint distribution and conditional distribution for bivariate random variables
* Compute the conditional expectation, covariance, and correlation

## Course Materials

**Textbook (Required):** Pitman, Jim. *Probability*, 6th edition. Springer, 2006. ISBN 978-387-97974-8

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).

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).

## How to Succeed in this Course

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/).

Mathematics is a skill that requires practice to develop. It is also a language with its own rules and conventions. In order to master the course material, you must exert consistent effort throughout the semester:

* Read the relevant section of the textbook prior to each lecture.
* Start working on each homework assignment as soon as possible after the corresponding lecture.

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)
* [UNT Learning Center](https://learningcenter.unt.edu/) (https://learningcenter.unt.edu/)
  + [Math Lab](file:///\\cas-home.unt.ad.unt.edu\HOME\alm0548\Teaching\MATH%201680%20Coordinator\Syllabus\Fall%202023\Math%20Lab) (https://learningcenter.unt.edu/math-lab)
  + [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 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.

## Creating an Inclusive Learning Environment

I value the many perspectives students bring to our campus. Please work with me to create a classroom culture of open communication, mutual respect, and belonging. All discussions should be respectful and civil. Although disagreements and debates are encouraged, personal attacks are unacceptable. Together, we can ensure a safe and welcoming classroom for all. If you ever feel like this is not the case, please stop by my office and let me know. We are all learning together.

## Course Schedule

|  |  |  |  |
| --- | --- | --- | --- |
| **Day** | **Date** | **Section** | **Topic** |
| Mon | 8/18/2025 | 1.1 | Equally Likely Outcomes |
| Tue | 8/19/2025 |  |  |
| Wed | 8/20/2025 | 1.2 | Interpretations |
| Thu | 8/21/2025 |  |  |
| Fri | 8/22/2025 | 1.3 | Distributions |
|  |  |  |  |
| Mon | 8/25/2025 | 1.4 | Conditional Probability and Independence |
| Tue | 8/26/2025 |  |  |
| Wed | 8/27/2025 | 1.5 | Bayes' Rule |
| Thu | 8/28/2025 |  |  |
| Fri | 8/29/2025 | 1.6 | Sequences of Events |
|  |  |  |  |
| Mon | 9/1/2025 |  | **Labor Day** |
| Tue | 9/2/2025 |  |  |
| Wed | 9/3/2025 | 2.1 | The Binomial Distribution |
| Thu | 9/4/2025 |  |  |
| Fri | 9/5/2025 | 2.2 | Normal Approximation: Method |
|  |  |  |  |
| Mon | 9/8/2025 | 2.4 | Poisson Approximation |
| Tue | 9/9/2025 |  |  |
| Wed | 9/10/2025 | 2.5 | Random Sampling |
| Thu | 9/11/2025 |  |  |
| Fri | 9/12/2025 |  |  |
|  |  |  |  |
| Mon | 9/15/2025 |  | **Exam 1 (Ch 1-2)** |
| Tue | 9/16/2025 |  |  |
| Wed | 9/17/2025 | 3.1 | Random Variables: Introduction |
| Thu | 9/18/2025 |  |  |
| Fri | 9/19/2025 | 3.1 | Random Variables: Introduction |
|  |  |  |  |
| Mon | 9/22/2025 | 3.2 | Expectation |
| Tue | 9/23/2025 |  |  |
| Wed | 9/24/2025 | 3.2 | Expectation |
| Thu | 9/25/2025 |  |  |
| Fri | 9/26/2025 | 3.3 | Standard Deviation and Normal Approximation |
|  |  |  |  |
| Mon | 9/29/2025 | 3.3 | Standard Deviation and Normal Approximation |
| Tue | 9/30/2025 |  |  |
| Wed | 10/1/2025 | 3.4 | Discrete Distributions |
| Thu | 10/2/2025 |  |  |
| Fri | 10/3/2025 | 3.5 | The Poisson Distribution |
|  |  |  |  |
| Mon | 10/6/2025 | 4.1 | Probability Densities |
| Tue | 10/7/2025 |  |  |
| Wed | 10/8/2025 | 4.1 | Probability Densities |
| Thu | 10/9/2025 |  |  |
| Fri | 10/10/2025 | 4.1 | Probability Densities |
|  |  |  |  |
| Mon | 10/13/2025 | 4.2 | Exponential Distribution |
| Tue | 10/14/2025 |  |  |
| Wed | 10/15/2025 | 4.2 | Exponential Distribution |
| Thu | 10/16/2025 |  |  |
| Fri | 10/17/2025 | 4.5 | Cumulative Distribution Functions |
|  |  |  |  |
| Mon | 10/20/2025 | 4.5 | Cumulative Distribution Functions |
| Tue | 10/21/2025 |  |  |
| Wed | 10/22/2025 | 4.4 | Change of Variable |
| Thu | 10/23/2025 |  |  |
| Fri | 10/24/2025 |  |  |
|  |  |  |  |
| Mon | 10/27/2025 |  | **Exam 2 (Ch 3-4)** |
| Tue | 10/28/2025 |  |  |
| Wed | 10/29/2025 | 5.1 | Continuous Joint Distributions: Uniform Distributions |
| Thu | 10/30/2025 |  |  |
| Fri | 10/31/2025 | 5.1 | Continuous Joint Distributions: Uniform Distributions |
|  |  |  |  |
| Mon | 11/3/2025 | 5.2 | Continous Joint Distribtuions: Densities |
| Tue | 11/4/2025 |  |  |
| Wed | 11/5/2025 | 5.3 | Independent Normal Variables |
| Thu | 11/6/2025 |  |  |
| Fri | 11/7/2025 | 5.4 | Operations (Sums, Products, and Ratios) |
|  |  |  |  |
| Mon | 11/10/2025 | 6.1 | Conditional Distributions: Discrete Case |
| Tue | 11/11/2025 |  |  |
| Wed | 11/12/2025 | 6.1 | Conditional Distributions: Discrete Case |
| Thu | 11/13/2025 |  |  |
| Fri | 11/14/2025 | 6.2 | Conditional Expectation: Discrete Case |
|  |  |  |  |
| Mon | 11/17/2025 | 6.3 | Conditioning: Density Case |
| Tue | 11/18/2025 |  |  |
| Wed | 11/19/2025 | 6.3 | Conditioning: Density Case |
| Thu | 11/20/2025 |  |  |
| Fri | 11/21/2025 | 6.4 | Covariance and Correlation |
|  |  |  |  |
| Mon | 11/24/2025 |  | **Thanksgiving** |
| Tue | 11/25/2025 |  | **Thanksgiving** |
| Wed | 11/26/2025 |  | **Thanksgiving** |
| Thu | 11/27/2025 |  | **Thanksgiving** |
| Fri | 11/28/2025 |  | **Thanksgiving** |
|  |  |  |  |
| Mon | 12/1/2025 | 6.5 | Bivariate Normal |
| Tue | 12/2/2025 |  |  |
| Wed | 12/3/2025 |  | Pre-finals Days |
| Thu | 12/4/2025 |  | Pre-finals Days |
| Fri | 12/5/2025 |  | Reading Day |
|  |  |  |  |
| Wed | 12/10/2025 |  | **Final Exam (8:00-10:00 am)** |

The above schedule is subject to change. Students will be notified by Eagle Alert if there is a campus closing that will impact a class.

## Assessing Your Work

| **Assignment** | **Weight** |
| --- | --- |
| Class Participation | 5% |
| Homework | 20% |
| Exams (2 x 25%) | 50% |
| Final Exam | 25% |
| **TOTAL** | **100%** |

## Grading

A = 90–100 % B = 80–89.9% C = 70–79.9% D = 60–69.9% F = 0–59.9%

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.

### 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 from a classmate. If you expect to miss one week or more due to circumstances beyond your control, please notify me in advance so that I can help you attain the course learning objectives.

I will periodically ask students to present their solutions to selected problems. Your class participation grade will be based on these presentations.

**Please turn off your cell phone and refrain from working on other assignments during lecture.**

## Homework Policy

Homework will be assigned regularly. Homework assignments, due dates, and solutions will be posted on Canvas. I will drop your lowest homework score before computing your homework average at the end of the semester. *Students should not use generative artificial intelligence (GenAI) to solve homework exercises.*

## Exam Policy

On exams, you will be allowed to use a calculator and one 8.5 x 11-inch sheet of paper with handwritten notes on both sides. *No other aids are permitted.*

* I reserve the right to test your ability to solve generalizations of the material covered in class or the textbook. In short, the problems on the exams may not look exactly like the homework exercises or the review problems.
* A student who misses an exam for valid and documented reasons should arrange to make up the exam within 10 days after the absence.

Syllabus Change PolicyAny changes to the syllabus will be announced in class and/or posted on Canvas.

## 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 the UNT Learning Management System (LMS) for contingency plans for covering course materials.