

FALL 2026 MATH 1680.220 – Elementary Probability and Statistics

Instructor Information

Name: Shafeena T Khan

Pronouns: She/Her

Office Location: GAB 407

Phone Number:

Student Support Hours: : Monday and Wednesdays: 3:50 pm-4:30pm GAB 407

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Hello! I have taught at UNT since 2022 and I am now a Lecturer in the Department of Mathematics.

Please call me Mrs. Khan. I received my Master of Science in Mathematics in Math teaching from the Texas Woman's University, and a Bachelor of Science cum laude in Mathematics from UNT.

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:** Send me a message using the [Canvas](#) Inbox.
- **Email:** Send me an email with "MATH 1680.220" in the subject line. *To protect your privacy, questions about your academic performance must be sent from your [UNT email account](#).*

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

Introductory course to serve [students of any field who want to apply statistical inference](#). Descriptive statistics, elementary probability, estimation, hypothesis testing and small samples. **Prerequisites:** TSI Complete. Students should be familiar with high-school algebra, fractions, decimals, and percentages.

This is a 15-week, face-to-face course that will cover most of the material in Chapter 1-11. There will be three exams covering approximately three chapters each, plus a comprehensive final exam. There is also a required lab that meets for one hour per week.

Learning Objectives

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

- Describe the process of conducting a statistical study

- Determine whether a study is observational or experimental and identify appropriate use cases
- Understand confounding
- Recognize different types of data such as qualitative, quantitative, discrete, continuous, and correctly identify the level of measurement
- Understand the pros and cons of different sampling methods
- Explain sources of bias
- Summarize and present data accurately using tables, graphs, and charts
- Calculate appropriate measures of center and dispersion
- Describe distribution shapes
- Standardize data using z-scores
- Recognize linear relationships between two variables
- Make accurate predictions using linear regression
- Calculate the probability of simple and compound events
- Understand disjoint and independent events
- Construct and interpret contingency tables
- Understand discrete and continuous random variables
- Identify the parameters of binomial random variables and compute probabilities, expected value, and standard deviation
- Compute probabilities using uniform and normal random variables
- Understand sampling distributions and the Central Limit Theorem
- Construct confidence intervals for population means and proportions
- Test hypotheses involving population means and proportions
- Distinguish between Type I and Type II errors

Required 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 also need:

- **Knewton Alta - 1 Term Access ELECTRONIC PRODUCT by Knewton.** Instead of a traditional textbook, the course material is contained in adaptive online assignments. Students must create a Knewton account as soon as possible in order to complete the first homework assignment. *Students will need to finalize their purchase before the end of the 14-day courtesy access period.*
- **Microsoft Office 365** (<https://it.unt.edu/installoffice365>)
- A laptop or mobile device (such as a tablet or smartphone) that is compatible with iClicker
- Fill-in-the-blank notes (available on Canvas)

I also recommend that you bring a scientific or graphing calculator to both lecture and lab. *You may use Desmos and Microsoft Excel, but not smartphones, during exams.* 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

At the beginning of the semester:

- Read this syllabus in detail 😊
- Familiarize yourself with the Canvas course
- Activate Knewton Alta by clicking on the first homework assignment

Before each class:

- Print/download the fill-in-the blank notes
- Prepare to take notes on the material discussed in class

During class:

- Arrive on time, and remain until the end of the class session
- Log into iClicker and keep it ready for activities
- Take notes on the material discussed in class
 - Highlight concepts that you think are important or don't understand
 - Write down questions that you would like to ask
 - Add comments to clarify possible misunderstandings

After class:

- Complete the iClicker exit poll
- Ask me any remaining questions you might have
- Review your notes, filling any gaps based on what you remember from lecture
- Start working on the appropriate Knewton Alta assignments

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 and explore unt.edu/wellness. To get all your enrollment and student financial-related questions answered, go to scrappysays.unt.edu.

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

- MATH 1680 Online Helpdesk (Schedule will be posted on Canvas.)
- [Math Lab](https://math.unt.edu/mathlab) (<https://math.unt.edu/mathlab>)
 - Get help with homework in a quiet environment.
- [UNT Learning Center](https://learningcenter.unt.edu/) (<https://learningcenter.unt.edu/>)
 - [Tutoring](https://learningcenter.unt.edu/tutoring) (<https://learningcenter.unt.edu/tutoring>)
 - Request free one-on-one tutoring.
- [Navigate's Study Buddy](https://navigate.unt.edu) (<https://navigate.unt.edu>)
 - Study with a classmate.

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](#) (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

Date		MWF	Lab
8/17/2026	Mon	Syllabus, 1.1	
8/18/2026	Tue		
8/19/2026	Wed	1.2, 1.3-1.4	Lab 1-Census & Helicopter Experiment
8/20/2026	Thu		
8/21/2026	Fri	1.5	
8/22/2026	Sat		
8/23/2026	Sun	HW 1.1-1.5	
8/24/2026	Mon	2.1, 2.2	
8/25/2026	Tue		
8/26/2026	Wed	2.3, 2.5	Lab 2-Designing a Statistical Study
8/27/2026	Thu		
8/28/2026	Fri	2.6	
8/29/2026	Sat		
8/30/2026	Sun	HW 2.1-2.3, 2.5-2.6	
8/31/2026	Mon	3.1	
9/1/2026	Tue		
9/2/2026	Wed	3.2	Lab 3-Graphic Displays of Data
9/3/2026	Thu		
9/4/2026	Fri	3.3, 3.4	
9/5/2026	Sat		
9/6/2026	Sun	HW 3.1-3.3	
9/7/2026	Mon	Labor Day	Labor Day

9/8/2026	Tue		
9/9/2026	Wed	3.4, 3.5	Lab 4-Measures of Center and Position
9/10/2026	Thu		
9/11/2026	Fri	3.8, 3.10	
9/12/2026	Sat		
9/13/2026	Sun	HW 3.4-3.5, 3.8, 3.10	
9/14/2026	Mon	4.1, 4.2	
9/15/2026	Tue		
9/16/2026	Wed	4.2, 4.3	Lab 5-Measures of Dispersion
9/17/2026	Thu		
9/18/2026	Fri	4.5	
9/19/2026	Sat		
9/20/2026	Sun		
9/21/2026	Mon	Exam 1 Review	
9/22/2026	Tue		
9/23/2026	Wed	Exam 1	Lab 6-Correlation and Regression
9/24/2026	Thu		
9/25/2026	Fri	4.7	
9/26/2026	Sat		
9/27/2026	Sun	HW 4.1-4.3, 4.5, 4.7	
9/28/2026	Mon	5.1	
9/29/2026	Tue		
9/30/2026	Wed	5.2	Lab 7-Probability
10/1/2026	Thu		
10/2/2026	Fri	5.3	
10/3/2026	Sat		
10/4/2026	Sun	HW 5.1-5.3	
10/5/2026	Mon	5.5	
10/6/2026	Tue		
10/7/2026	Wed	5.6	Lab 8-Contingency Tables
10/8/2026	Thu		
10/9/2026	Fri	6.1	
10/10/2026	Sat		
10/11/2026	Sun	HW 5.5-5.6, 6.1	
10/12/2026	Mon	6.2	
10/13/2026	Tue		
10/14/2026	Wed	6.6	Lab 9-Discrete Random Variables
10/15/2026	Thu		
10/16/2026	Fri	7.1	
10/17/2026	Sat		

10/18/2026	Sun	HW 6.2, 6.6, 7.1	
10/19/2026	Mon	8.1	
10/20/2026	Tue		
10/21/2026	Wed	8.2	Lab 10-Binomial Distribution
10/22/2026	Thu		
10/23/2026	Fri	8.4	
10/24/2026	Sat		
10/25/2026	Sun	HW 8.1-8.2	
10/26/2026	Mon	Exam 2 Review	
10/27/2026	Tue		
10/28/2026	Wed	Exam 2	Lab 11-Normal Distribution
10/29/2026	Thu		
10/30/2026	Fri	9.3	
10/31/2026	Sat		
11/1/2026	Sun	HW 8.4, 9.3	
11/2/2026	Mon	9.4	
11/3/2026	Tue		
11/4/2026	Wed	10.2	Lab 12-Sampling Distributions
11/5/2026	Thu		
11/6/2026	Fri	10.3	
11/7/2026	Sat		
11/8/2026	Sun	HW 9.4, 10.2-10.3	
11/9/2026	Mon	10.4	
11/10/2026	Tue		
11/11/2026	Wed	10.8	Lab 13-Confidence Intervals
11/12/2026	Thu		
11/13/2026	Fri	11.1	
11/14/2026	Sat		
11/15/2026	Sun	HW 10.4, 10.8	
11/16/2026	Mon	Exam 3 Review	
11/17/2026	Tue		
11/18/2026	Wed	Exam 3	Final Review
11/19/2026	Thu		
11/20/2026	Fri	11.2	
11/21/2026	Sat		
11/22/2026	Sun		
11/23/2026	Mon	Thanksgiving Break	Thanksgiving Break
11/24/2026	Tue	Thanksgiving Break	Thanksgiving Break
11/25/2026	Wed	Thanksgiving Break	Thanksgiving Break
11/26/2026	Thu	Thanksgiving Break	Thanksgiving Break

11/27/2026	Fri	Thanksgiving Break	Thanksgiving Break
11/28/2026	Sat		
11/29/2026	Sun	HW 11.1, 11.2	
11/30/2026	Mon	11.3	
12/1/2026	Tue		
12/2/2026	Wed	Final Review	Final Review
12/3/2026	Thu	HW 11.3	
12/4/2026	Fri		
12/5/2026	Sat		
12/6/2026	Sun		
12/7/2026	Mon		
12/8/2026	Tue		
12/9/2026	Wed	Final exam 8am-10am	
12/10/2026	Thu		

Lab Schedule:

Date	lab
8/19/2026	Lab 1-Census & Helicopter Experiment
8/26/2026	Lab 2-Designing a Statistical Study
9/2/2026	Lab 3-Graphic Displays of Data
9/9/2026	Lab 4-Measures of Center and Position
9/16/2026	Lab 5-Measures of Dispersion
9/23/2025	Lab 6-Correlation and Regression
9/30/2026	Lab 7-Probability
10/7/2026	Lab 8-Contingency Tables
10/14/2026	Lab 9-Discrete Random Variables
10/21/2026	Lab 10-Binomial Distribution
10/28/2026	Lab 11-Normal Distribution
11/4/2026	Lab 12-Sampling Distributions
11/11/2026	Lab 13-Confidence Intervals
11/18/2026	Final Review
11/25/2026	THANKSGIVING BREAK
12/2/2026	Final Review

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

Final Exam

A mandatory and comprehensive final exam will be given on **Dec 9th @ 8am– 10am am** in the **Sage Hall Computer-Based Testing Center (SAGE 331)**.

Course Topics

CHAPTER 1 Data Collection

- 1.1 Evidence, Claims, and Study Types
- 1.2 Variables and Measures of Data
- 1.3 Sampling Methods
- 1.4 Sampling Methods
- 1.5 Sampling Errors, Bias, and Misleading Statistics

CHAPTER 2 Graphic Displays of Data

- 2.1 Organizing Qualitative (Categorical) Data
- 2.2 Frequency Tables for Quantitative (Numerical) Data
- 2.3 Histograms
- 2.5 Histograms and Frequency Tables with Excel
- 2.5 Line Graphs, Dot Plots, and Stem-and-Leaf Plots

CHAPTER 3 Measures of Center and Dispersion

- 3.1 Measures of Central Tendency
- 3.2 Which Measure of Central Tendency Should I Use?
- 3.3 Quartiles and Box Plots
- 3.4 Standard Deviation
- 3.5 The Empirical Rule
- 3.8 Measures of Central Tendency with Excel
- 3.10 Measures of Spread with Excel

CHAPTER 4 Correlation and Regression

- 4.1 Scatter Plots and Correlation
- 4.2 Linear Regression Equations
- 4.3 Least Squares and Outliers
- 4.5 Coefficient of Determination
- 4.7 Performing Linear Regressions with Excel

CHAPTER 5 Probability

- 5.1 Probability Terminology and Notation
- 5.2 Basic Probability
- 5.3 Independent and Mutually Exclusive Events
- 5.5 Addition and Multiplication Rule
- 5.6 Contingency Tables

CHAPTER 6 Discrete Random Variables

- 6.1 Introduction to Discrete Probability Distributions
- 6.2 The Binomial Distribution
- 6.6 Discrete Random Variables with Excel

CHAPTER 7-8 Continuous Random Variables

- 7.1 The Uniform Distribution
- 8.1 The Normal Distribution-Parameters
- 8.2 The Normal Distribution-Probability
- 8.4 The Normal Distribution with Excel

CHAPTER 9 Central limit Theorem

9.3 Central Limit Theorem for Means

9.4 Central Limit Theorem for Proportions

CHAPTER 10 Confidence Intervals

10.2 Confidence Interval for a Mean-Population Standard Deviation Known

10.3 Confidence Interval for a Mean-Population Standard Deviation Unknown

10.4 Confidence Interval for a Population Proportion

10.8 Confidence Intervals with Excel

CHAPTER 11 Hypothesis Testing for One Population

11.1 Introduction to Hypothesis Testing

11.2 Hypothesis Test for Mean-Population Standard Deviation Known

11.3 Hypothesis Test for Mean-Population Standard Deviation Known (P-value)

11.4 Hypothesis Test for Mean-Population Standard Deviation Unknown

11.6 Hypothesis Test for Proportion

Assessing Your Work

Assignment	Percentage
Participation	5%
Homework	18%
Lab Projects	14%
Exams @ 15%	45%
Final Exam	18%
Review Center (Extra Credit)	4%
Total	104%

Grading Policy

- 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 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 required to take exams in the Sage Hall Computer-Based Testing Center (SAGE 331).

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 and your lab instructor in advance so that we can help you attain the course learning objectives. You may also provide documentation verifying the reason for your absence to the [Dean of Students](https://studentaffairs.unt.edu/dean-of-students) (<https://studentaffairs.unt.edu/dean-of-students>) and ask them to advocate on your behalf.

Your participation grade will be based on iClicker polls delivered during class. Students who respond to at least 70% of the iClicker polls will receive all 5 participation points. Students who respond to less than 70% of the iClicker polls will receive 0 participation points. *Canvas will not automatically calculate this properly; you may enter 0 or 100 as your iClicker score to see how that would affect your grade.*

Recordings

This is a face-to-face class, not an online class. Nevertheless, I may record some of my lectures via Zoom for students who are unable to attend class. I reserve the right to restrict access to such recordings to students who have a valid and documented reason for missing class.

Homework Policy

Students may complete homework assignments up to 7 days after the due date. Assignments completed during this 7-day grace period will incur a 20% penalty. I will also drop the **two** lowest homework scores before computing your average at the end of the semester.

Lab Project Policy

Students are required to attend the lab session in which they are enrolled. The lab projects are designed to be completed in groups during the lab sessions. If you are unable to complete a project in the allotted time, you may request an extension from your lab instructor *in person*. If you are unable to attend a lab session for valid and documented reasons, you may request an extension from me electronically. I will also drop your lowest lab project score before computing your average at the end of the semester.

Exam Policy

Unauthorized Aids During Examinations and Assessments

Students may use only those materials and resources that are expressly authorized by the instructor for a particular examination or assessment. Touching, holding, or accessing any unauthorized aid during the examination period constitutes a violation of the Student Code of Conduct, regardless of whether the aid is used.

Any item that may be considered an unauthorized aid must be kept out of view and in a closed container (e.g. zipped backpack, buttoned purse, etc.) during the entirety of the examination or assessment.

Unless specifically authorized in writing by the instructor, prohibited aids include, but are not limited to:

- Mobile phones and smartphones
- Smartwatches and fitness trackers with communication, recording, or internet capabilities
- Tablets, laptops, and other computing devices
- Earbuds, headphones, and other audio devices
- Smart glasses, cameras, recording devices, and wearable technology
- Artificial intelligence (AI) tools, chatbots, and other generative AI technologies
- Notes, textbooks, study guides, formula sheets, or reference materials
- Any other device, material, or resource not expressly permitted by the instructor

Students are responsible for clarifying any questions about permitted materials before the examination begins.

Students may use a scientific or graphing calculator, the online graphing calculator Desmos, and Microsoft Excel during exams. I will also provide a formula sheet. *No other notes or assistance are permitted. In particular, the use of smartphones and searching the internet are prohibited during exams!*

You may request to take an exam early. Please submit your request at least one week prior to the date you would like to take the exam.

Your score on the final exam will replace your lowest exam score if the final exam score is higher (unless you receive a zero on an exam for academic dishonesty).

[Syllabus Change Policy](#)

Any 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.