MATH 3680 - 003 (Spring 2026): Applied Statistics Syllabus

Instructor Information

Name: Junhyeon Kwon
Office Location: LIFE A419
Course Meets: 9:00 AM – 9:50 AM (MWF)
E-mail: Junhyeon.Kwon@unt.edu
Office Hours: Monday, Wednesday 10:00 AM – 12:00 PM or by appointment

How to Communicate with Your Instructor

Connect with me through email and/or by attending office hours. All students are required to use their official UNT email account for all course-related communications to ensure security. Emails from non-UNT accounts may not receive a response.

Please ensure that your email subject line begins with "MATH 3680.003" to help me notice and prioritize your message. During busy periods, my inbox can become quite full. If you do not receive a response within two business days, feel free to send a gentle follow-up email.

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 that will cover selected material from Chapter 1-5, Chapter 7-9, and Chapter 12. The course material is divided into 23 lectures. There will be two mid-term 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.

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).

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.

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.

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 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.

How to Succeed in this 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 section of the textbook prior to each lecture.
- Start working on each homework assignment as soon as possible after the corresponding lecture.

- When studying for exams, make a good-faith effort to solve all the review problems before watching the video solutions.

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:

- Navigate's Study Buddy (https://navigate.unt.edu)
- Math Lab (https://math.unt.edu/mathlab)
- UNT Learning Center (https://learningcenter.unt.edu/)
    - Tutoring (https://learningcenter.unt.edu/tutoring)

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

7.3 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			
1/12 – 1/16	Lecture 1 - 3	1.2, 1.3, 1.4	Graphical Representation of Data, Mean and Standard Deviation
	Homework 0		
Week 2			
1/19 – 1/23	Lecture 4 - 6	2.2, 2.4, 2.5	Probability

	Homework 1	1.2-1.4	
Week 3			
1/26 – 1/30	Lecture 7 - 8	3.1, 3.2, 3.3	Discrete Random Variables and Probability Distributions
	Homework 2	2.2, 2.4 and 2.5	
Week 4			
2/2 – 2/6	Lecture 9 - 11	3.4, 3.5, 4.1, 4.2	Binomial and Hypergeometric Distribution, Continuous Random Variables
	Homework 3	3.1- 3.5	
Week 5			
2/9 – 2/13	Lecture 12 - 14	4.3	The Normal Distribution
	Homework 4	**Review for Calculus I**	
Week 6			
2/16 – 2/18	Lecture 15 - 16	4.3, 4.6, 5.4, 5.5	Approximating Bin(n, p) with the Normal Distribution, Probability Plots and Linear Combinations of Random Variables
	Homework 5	4.1, 4.2, 4.3	
2/20	**Exam 1**	**Chapter 1-4**	
Week 7			
2/23 – 2/25	Lecture 17 - 19	5.4, 7.1, 7.2	The Central Limit Theorem, Confidence Intervals: Large samples or known σ
	Homework 6	4.6, 5.4 and 5.5	
Week 8			
3/2 – 3/6	Lecture 20 - 22	7.2, 7.3	Confidence Intervals and Prediction Intervals
	Homework 7	7.1, 7.2	
3/9/2026 – 3/13/2026: Spring Break (No class)			
Week 9			
3/16 – 3/20	Lecture 23 - 25	8.1	Introduction to Hypothesis Testing
	Homework 8	7.3, 8.1	
Week 10			
3/23 – 3/27	Lecture 26 - 28	8.2, 8.3	Hypothesis Testing
	Homework 9	8.2, 8.3	
Week 11			
3/30 – 4/1	Lecture 29 - 30	9.1, 9.2, 9.3, 9.4	Two-Sample Data: Unpaired Samples and Proportions
	Homework 10	9.1, 9.2	
4/3	**Exam 2**	**Chapter 5-8**	
Week 12			
4/6 – 4/10	Lecture 31 - 33	9.2, 9.3, 9.4	Two-Sample Data: Paired Large Samples
	Homework 11	9.3, 9.4	
Week 13			
4/13 – 4/17	Lecture 34 - 36	12.5	Correlation
	Homework 12	12.5	
Week 14			
4/20 – 4/24	Lecture 37 - 39	12.1, 12.2	Linear Regression
	Homework 13	12.1, 12.2	
Week 15 (Pre Final week)			
	Review		
Final Week (5/4 - 5/8)			
5/6	**Comprehensive Final exam (7:30 AM – 9:30 AM)**		

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.

Assessing Your Work

DataCamp Homework	10%
WebAssign Homework	20%
Two midterm exams	20% each
Final exam	30%
Total	**100%**

Grading

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

Additionally, your attendance percentage, calculated as the proportion of total classes where attendance was recorded, will be multiplied by 3 to determine the extra points added to your final grade. For example, attending 90% of the classes will earn you 2.7 extra points (90% of 3) towards your final grade.

If you are facing academic challenges, at risk of losing your financial support, or have external expectations for a specific grade at the end of the semester, it is crucial to take action now. Start working diligently today. **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), 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

Attending each lecture is essential to your success in this course. You are expected to attend every lecture and arrive on time. You are responsible for any material covered, any work assigned, or any course changes made during the lecture. To emphasize the importance of regular class participation, attendance will be taken at the beginning of each class. If you anticipate being absent, it is important to communicate with the instructor in advance. University-authorized absences will be counted as attendance if you provide a valid documentation. (See UNT Policy 06.039.) However, please note that late arrivals will not be recorded.

Examination Policy

All exams are closed-book/notes, and calculators may be needed. You are expected to be present, seated, and ready to take the exam before the exam begins. You are not permitted to use any outside materials, resources, or electronic devices (including but not limited to mobile phones, smartwatches, etc., but not including a calculator) on the exams.

The Final Examination will be comprehensive in the sense that problems may come from any of the sections that will be covered during the semester. I reserve the right to test and quiz you on problems which 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 I say in class is fair game for exam material. Everything on every handout is fair game for exam material. You will be responsible for everything unless I advise you to the contrary.

Once the grading is completed, you will have the opportunity to review your graded exams during office hours. You will have 48 hours to appeal your grade after the review. Appeals submitted after this 48-hour period will not be considered.

I will not drop the lowest exam score; all will count toward the final grade.

There will be no make-up for the midterm exams, even in the case of an emergency. A missed exam counts as a zero unless a valid documentation for University-authorized absence (see UNT Policy 06.039) is provided to your instructor within 48 hours of the missed exam. Students who miss a scheduled exam for an unforseen reasons (e.g., family emergency, personal health problems, or similar legitimate reasons) are expected to contact the instructor immediately, and then only at the discretion of the instructor. With an acceptable excuse, a missed exam score will be replaced with the percentage earned on the corresponding portion of the final exam.

Make-up tests for the final exam will be allowed only if I am notified of the University-authorized absence at least a week in advance. A make-up exam can consist of different questions than the regular exam, possibly making the make-up exam more difficult.

Homework Policies

Homework assignments can be accessed via WebAssign (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. However, this bonus will be applied only within the portion of your final

grade allocated to homework (which is 20% of the total course grade). In other words, this bonus will not increase the weight of homework beyond its designated 20% of the total grade.

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**

AI Usage

The availability of large language models, such as ChatGPT (chat.openai.com) and Gemini, is rapidly changing the tools that are available to students and in the "real world." These large language models, however, are not allowed to be used in our class. Any use of ChatGPT, Grammarly or other AI tools will result in an academic integrity violation.

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 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 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).