MATH 279: Statistics and Probability for Engineers
Spring 2025 Course Syllabus

NJIT Academic Integrity Code: All Students should be aware that the Department of Mathematical Sciences takes the University Code on Academic Integrity at NJIT very seriously and enforces it strictly. This means that there must not be any forms of plagiarism, i.e., copying of homework, class projects, or lab assignments, or any form of cheating in quizzes and exams. Under the University Code on Academic Integrity, students are obligated to report any such activities to the Instructor.

COURSE INFORMATION

Course Description: This course introduces methods of summarizing and analyzing engineering data and the importance of observing processes over time such as control charts. Descriptive statistics, plots and diagrams are then used to summarize the data. Elements of probability and random variables with their distributions along with mean and variance are taught. All this knowledge is then used as a platform towards covering how to do basic estimation and inference, including confidence intervals and hypothesis testing based on a single sample. Students taking this course cannot receive degree credit for MATH 225, MATH 244, or MATH 333.

Number of Credits: 2

Prerequisites: MATH 112 with a grade of C or better or MATH 133 with a grade of C or better.

Course-Section and Instructors:

Course-Section	Instructor
Math 279-102	Professor D. Schmidt

Office Hours for All Math Instructors: Spring 2025 Office Hours and Emails

Required Textbook:

Title	*Engineering Statistics*
Author	Montgomery, et al.
Edition	5th
Publisher	John Wiley & Sons, Inc.
ISBN #	978-0470631478

University-wide Withdrawal Date: The last day to withdraw with a **W** is **Monday, April 7, 2025**. It will be strictly enforced.

POLICIES

DMS Course Policies: All DMS students must familiarize themselves with, and adhere to, the Department of Mathematical Sciences Course Policies, in addition to official university-wide policies. DMS takes these policies very seriously and enforces them strictly.

Grading Policy: The final grade in this course will be determined as follows:

Homework	20%
Quizzes	20%
Midterm Exam	30%
Final Exam	30%

Your final letter grade will be based on the following tentative curve.

A	90 - 100	**C**	65 - 74
B+	85 - 89	**D**	55 - 64
B	80 - 84	**F**	0 - 54
C+	75 - 79		

Attendance Policy: Attendance at all classes will be recorded and is **mandatory**. Please make sure you read and fully understand the Math Department's Attendance Policy. This policy will be strictly enforced.

Religious Observance: NJIT is committed to supporting students observing religious holidays. Students must notify their instructors in writing of any conflicts between course requirements and religious observances, ideally by the end of the second week of classes and no later than two weeks before the anticipated absence.

Homework and Quizzes: Homework problems will be collected every class meeting; all problems should be completed to build understanding, however only those problems marked with an asterisk (*) are required and graded. A short quiz based on the homework will be given at the beginning of every class meeting. There are no make-up quizzes. Late homework and absent homework will be accepted no more than 6 days late (no penalty for absent homework, half credit for late homework).

Generative AI: This course expects students to work without artificial intelligence (AI) assistance in order to better develop their skills in this content area. As such, AI usage is not permitted in this course for solving problems in class, on homework assignments, or any form of assessment.

Exams: There will be one midterm exam held in class during the semester and one comprehensive final exam. The final exam will be held during the following week:

Midterm Exam Week	Week 8
Final Exam Period	May 10 - May 16, 2024

The final exam will test your knowledge of all the course material taught in the entire course. Make sure you read and fully understand the Math Department's Examination Policy. This policy will be strictly enforced.

Makeup Exam Policy: There will be **NO MAKE-UP QUIZZES OR EXAMS** during the semester. In the event an exam is not taken under rare circumstances where the student has a legitimate reason for missing the exam, the student should contact the Dean of Students office and present written verifiable proof of the reason for missing the exam, e.g., a doctor's note, police report, court notice, etc. clearly stating the date AND time of the mitigating problem. The student must also notify the Math Department Office/Instructor that the exam will be missed.

Calculator Policy: Only basic, non-programmable scientific calculators are permitted (no graphing, no integration/differentiation)

ADDITIONAL RESOURCES

Math Tutoring Center: Located in the Central King Building, Lower Level, Rm. G11 (See: Spring 2025 Hours)

Further Assistance: For further questions, students should contact their instructor. All instructors have regular office hours during the week. These office hours are listed on the Math Department's webpage for Instructor Office Hours and Emails.

Accommodation of Disabilities: The Office of Accessibility Resources and Services (OARS) offers long term and temporary accommodations for undergraduate, graduate and visiting students at NJIT.

If you are in need of accommodations due to a disability please If you need an accommodation due to a disability please contact the Office of Accessibility Resources and Services at oars@njit.edu. The office is located in Kupfrian Hall, Room 201. A Letter of Accommodation Eligibility from the Office of Accessibility Resources and Services office authorizing your accommodations will be required.

For further information regarding self identification, the submission of medical documentation and additional support services provided please visit the Office of Accessibility Resources and Services (OARS) website at:

https://www.njit.edu/accessibility/

Important Dates (See: Spring 2025 Academic Calendar, Registrar)

Date	Day	Event
January 21, 2025	Tuesday	First Day of Classes
January 27, 2025	Monday	Last Day to Add/Drop Classes
March 16, 2025	Sunday	Spring Recess Begins
March 22, 2025	Saturday	Spring Recess Ends

April 3, 2025	Thursday	Wellness day
April 7, 2025	Monday	Last Day to Withdraw
April 18, 2025	Friday	Good Friday - No Classes
April 20, 2025	Sunday	Easter Sunday - No Classes Scheduled
May 6, 2025	Tuesday	Thursday Classes Meet
May 7, 2025	Wednesday	Friday Classes Meet
May 7, 2025	Wednesday	Last Day of Classes
May 8, 2025	Thursday	Reading Day 1
May 9, 2025	Friday	Reading Day 2
May 10 - May 16, 2025	Friday to Thursday	Final Exam Period

Course Outline

Week	Section	Topic	Homework Problems
1	2.1-2.2, 2.4	Data summary, Stem-and- Leaf Diagram, Box Plots	Page 28 #2.1, 2.3, 2.4* (no dot plots), Page 33 #2.14*, 2.20*, 2.25*, construct a box plot for the data in 2.20
2	3.1, 3.2 3.3	Random Variables and Probability	Page 61 #3.1-3.7, Page 65 #3.12*, 3,13, 3,16*, 3.17*, 3.18
3	3.7	Discrete Random Variables	Page 101 #3.91(No graph), 3.93 (No graph), 3.94 *(a - e), 3.96, 3.100* (a - d)
4	3.8	Binomial Distribution	Page 108 #3.103, 3.106*, 3.108*, 3.109, 3.111*, 3.113, 3.116
5	3.4	Probability Density Function, Mean and Variance	Page 72 #3.23, 3.24*, 3.26* (no graph), 3.27, 3.31*, 3.37
6	3.9.1	Poisson Distribution	Page 117 #3.121, 3.123*, 3.127, 3.130*, 3.131

7	3.9.2	Exponential Distribution & REVIEW	Page 118 #3.136*, 3.137, 3.138*, 3.142*, 3.144
8		**MIDTERM EXAM**	
9	3.5.1 3.13	Normal Distribution, Random Samples, Statistics, and The Central Limit Theorem	Page 90 # 3.41, 3.43, 3.45*, 3.47*, 3.50*, Page 140 #3.195, 3.197, 3.199*, 3.200, 3.201*, 3.203, 3.204*
10	4.4.5 4.5.3	Confidence Intervals, Choice of Sample Size	Page 186 #4.40 (Part d), 4.41* (Part d), 4.43* (part c, d) Page 197 #4.63 (Part d) and find a 95% Lower Confidence bound, 4.57* (part b), 4.59 (part c)
11	4.3	Type I, Type II error	Page 168 #4.15*, 4.17*, 4.18, 4.19*, 4.21, 4.25
12	4.3, 4.4 4.5	Intro to Hypothesis Testing on the Mean	Page 185 #4.37(Parts a (use rejection region), b, d), 4.38* (Part a (use rejection regions AND P-value), and part e), 4.40a (use rejection regions AND P-value), Page 197 # 4.54* (Parts a, d), 4.55 (Part a), 4.57 (Part a)
13	4.7	Tests on a Population Proportion	Page 214 #4.75* (Parts a, c, d, f)
14		Review for Final Exam	