MATH 279: Statistics and Probability for Engineers
Spring 2024 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 A. Ionescu
Math 279-104	Professor A. Ionescu

Office Hours for All Math Instructors: Spring 2024 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 1, 2024**. 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	5%
Quizzes	30%
Midterm Exam	30%
Final Exam	35%

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.

Homework: Either homework will be collected, or a short quiz based on the homework will be given. There are no make-up quizzes, but the lowest quiz/HW grade for the semester will be dropped.

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	
Final Exam Period	May 3 - May 9, 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.

Cellular Phones: All cellular phones and other electronic devices must be switched off during all class times.

ADDITIONAL RESOURCES

Math Tutoring Center: Located in the Central King Building, Lower Level, Rm. G11 (See: Spring 2024 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 2024 Academic Calendar, Registrar)

Date	Day	Event
January 16, 2024	Tuesday	First Day of Classes
January 22, 2024	Monday	Last Day to Add/Drop Classes
March 10, 2024	Sunday	Spring Recess Begins
March 16, 2024	Saturday	Spring Recess Ends
March 29, 2024	Friday	Good Friday - No Classes
April 1, 2024	Monday	Last Day to Withdraw
April 30, 2024	Tuesday	Friday Classes Meet
April 30, 2024	Tuesday	Last Day of Classes
May 1, 2024	Wednesday	Reading Day 1
May 2, 2024	Thursday	Reading Day 2
May 3 - May 9, 2024	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	2.1, 2.3, 2.4 (no dot plots), 2.15, 2.16, 2.34, 2.36, 2.38c, 2.40d
2	3.3	Probability Overview	3.12, 3.15, 3.16, 3.17, 3.18 + additional problems assigned in class
3	3.1-3.2, 3.7	Random Variables; Discrete Random Variables	3.91, 3.94, 3.95, 3.96, 3.99
4	3.8	Discrete Uniform Distribution, Binomial Distribution	3.107, 3.110, 3.111, 3.118 + Suppose a R.V. has a discrete distribution over the values 6, 7, 8, 9, 10. Find the expected value of X and standard deviation of X.
5	3.4	Probability Density Function, Mean and Variance	3.21abc, 3.24, 3.27, 3.29, 3.34
6	3.9.1	Poisson Distribution & Continuous Uniform Distribution	3.122, 3.123, 3.124 + Suppose a R.V. X has a continuous uniform distribution on 0<x<5. Find the mean and variance of X. Also find P(4<x<7).
7	3.9.2	Exponential Distribution & REVIEW	3.136, 1.137, 3.141
8		**MIDTERM EXAM**	
9	3.5.1	Normal Distribution	3.43, 3.45, 3.47, 3.50, 3.54
10	3.13	Point Estimates, Distribution of Sample Mean; Central Limit Theorem	3.195, 3.199, 3.200, 3.203, 3.204
11	4.1-4.2, 4.3 4.4	Type I II error, Informal Test	4.37, 4.39, 4.42, 4.43 (use rejection regions),
12	4.4	Z-test, P-value, Confidence Intervals	4.37abe, 4.39ade 4.42abef, 4.43
13	4.5	T-test, P-value, Confidence Intervals	4.53ac, 4.55ac, 4.59bc

14	4.7	Tests on a Population Proportion	4.75ade, 4.82, 4.83ab, 4.87a
	└►	**REVIEW FOR FINAL EXAM**	