

THE DEPARTMENT OF MATHEMATICAL SCIENCES

## 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 279-002	Professor F. Jamedar
Math 279-004	Professor F. Jamedar
Math 279-006	Professor F. Jamedar

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:

Hand-in Homework	15%
Exam I	25%
Exam II	25%
Final Exam	35%

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

A	90 - 100	C+	75 - 79
В+	85 - 89	с	65 - 74
В	80 - 84	D	64 and Below

**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 policy: There will be homework assigned through the course outline and collected on the day of each exam. NO LATE SUBMISSION IS ACCEPTED. Home work must be on loose leaf paper either neatly handwritten with the name and the course's section number printed on the top sheet and stapled. No need to type the homework, IT WILL NOT BE ACCEPTED. The homework will be collected prior to taking the exam. If given instructions are not followed exactly, Home work will not be accepted.

Exams: There will be two exams during the semester and a cumulative final exam during the final exam week:

Exam I	Week 5

Exam II	Week 10
Final Exam Period	May 10 - May 16, 2025

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 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	Sections	Торіс	Assignment
	1.1	The engineering method and	1-1,1-2,1-4,1-6
		statistical thinking	
	1.2	Collecting Engineering Data	1-7,1-8,1-9,1-12,1-14
	2.1	Data summary and display	2-1,2-2,2-3,2-4,2-7,2-8,2-9-2-10
	2.2	Stem and leaf diagram	2-14,2-16,2-20,2-22,2-24
	2.3	Histogram	2-26,2-28,2-32
	2.4	Box plot & measures of positions	2-33(a,b,c,e), 2-34,2-38,2-39
	2.5	Time series plot	2-44,2-46 a,2-50
	2.6	Multivariate data	2-52,2-53,2-54 find the line of best fit as well,256,258
5	Test 1	Topics: 1.1-2.6	
	3.1	Introduction to probability	
	3.2	Random Variables	3-1 to 3-9
	3.3	Probability	3-10,3-11,3,-12,3-13,3-15,3-17,3-18
	3.4	Continuous random variables	
	3.4.1	Probability density function	3-21,3-23, 3-24, 3-25, 3-26
	3.4.2	Cumulative distribution function	3-22,3-27,3-28,3-29,3-31,3-33
	3.5.1	Normal Distribution	3-38,3-40,3-41,3-42,3-43,3-45,3-46,3-50
	3.7	Discrete random Variables	
	3.7.1	Probability mass function	3-91 to 3-95
	3.7.2	Cumulative Distribution function	3-96,3-97,3-98
	3.7.3	Mean and variance	3-101 3-103 3-105 3-107
	3.8	Binomial Distribution	5-101,5-105,5-107
10	Test 2	Topics: 3.1-3.8	
	3.9	Poisson Distribution	3-120,3-122,3-127,3-128
	3.13	Central limit theorem	3-195,3-196,3-197,3-200,3-201
	4.1	Statistical inferences	
	4.2	Point estimation	4-1,4-3,4-5
	4.3	Hypothesis testing	

	4.3.1	Statistical hypothesis	4-15.4-17,4-18,4-19
	4.3.2	Testing statistical hypothesis	
		Review for Final Exam	
15		Comprehensive Final Exam	

Updated by Professor F. Jamedar - 2025 Department of Mathematical Sciences Course Syllabus, Spring 2025