Fall 2024

MATH 279-007: Stats & Probabilty for Engr

F. Jamedar

MATH 279: Statistics and Probability for Engineers
Fall 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 279-005	Professor F. Jamedar
Math 279-007	Professor F. Jamedar
Math 279-009	Professor F. Jamedar
Math 279-103	Professor F. Jamedar

Office Hours for All Math Instructors: Fall 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, November 11, 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:

Hand-in Homework	10%
Exam I	25%
Exam II	25%
Final Exam	35%
Participation	5%

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

A	90 - 100	**C+**	75 - 79
B+	85 - 89	**C**	65 - 74
B	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.

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	December 15 - December 21, 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: Fall 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 need an accommodation due to a disability, please contact the Office of Accessibility Resources and Services at oars@njit.edu, or visit Kupfrian Hall 201 to discuss your specific needs. A Letter of Accommodation Eligibility from the office authorizing student accommodations is 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: Fall 2024 Academic Calendar, Registrar)

Date	Day	Event
September 2, 2024	Monday	Labor Day
September 3, 2024	Tuesday	First Day of Classes
September 9, 2024	Monday	Last Day to Add/Drop Classes
November 11, 2024	Monday	Last Day to Withdraw
November 26, 2024	Tuesday	Thursday Classes Meet
November 27, 2024	Wednesday	Friday Classes Meet
November 28 to December 1, 2024	Thursday and Sunday	Thanksgiving Recess - Closed
December 11, 2024	Wednesday	Last Day of Classes
December 12, 2024	Thursday	Reading Day 1

December 13, 2024	Friday	Reading Day 2
December 15 to December 21, 2024	Sunday to Saturday	Final Exam Period

Course Outline

Week	Sections	Topic	Assignment
	1.1	The engineering method and statistical thinking	1-1,1-2,1-4,1-6
	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**	
6		**Mid Semester Project Due**	
	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 3.4.1 3.4.2	Continuous random variables Probability density function Cumulative distribution function	 3-21,3-23, 3-24, 3-25, 3-26 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 3.7.1 3.7.2 3.7.3 3.8	Discrete random Variables Probability mass function Cumulative Distribution function Mean and variance Binomial Distribution	 3-91 to 3-95 3-96,3-97,3-98 3-101,3-103,3-105,3-107
10	**Test 2**	**Topics: 3.1-3.8**	
	3.9 3.13	Poisson Distribution Central limit theorem	3-120,3-122,3-127,3-128 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 4.3.1 4.3.2	Hypothesis testing Statistical hypothesis Testing statistical hypothesis	4-15.4-17,4-18,4-19
		Review for Final Exam	
15		**Comprehensive Final Exam**	