NJIT New Jersey's Science & Technology University

THE COLLEGE OF SCIENCE AND LIBERAL ARTS

THE DEPARTMENT OF MATHEMATICAL SCIENCES

MATH 279: Statistics and Probability for Engineers
Fall 2018 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 279-101	Professor P. Narayanan
Math 279-103	Professor P. Narayanan

Office Hours for All Math Instructors: Fall 2018 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 12, 2018**. 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:

3 Quizzes (5% each)	15%
Class Participation	5%
2 Midterm Exams (20% each)	40%
Final Exam	40%

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 Policy: Each week, either homework will be collected or a short quiz based on the homework will be given. There will be no make-up quizzes, and absolutely no exceptions whatsoever. If absent for valid reasons ONLY, homework will be accepted the following class for full credit. Otherwise, any late homework cannot be accepted.

Class Project: A take home project worth 15% of the total final grade will be assigned at the middle of the semester. A period will be assigned in which duration the project must be completed. If the project is not completed during the assigned period the credit will be forfeited.

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

Midterm Exam I	Week 6
Midterm Exam II	Week 11
Final Exam Week	December 15 - 21, 2018

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 2018 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.

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

Accommodation of Disabilities: Disability Support Services (DSS) 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 contact Chantonette Lyles, Associate Director of Disability Support Services at 973-596-5417 or via email at lyles@njit.edu. The office is located in Fenster Hall Room 260. A Letter of Accommodation Eligibility from the Disability Support 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 Disability Support Services (DSS) website at:

- http://www5.njit.edu/studentsuccess/disability-support-services/

Important Dates (See: Fall 2018 Academic Calendar, Registrar)

Date	Day	Event
September 4, 2018	T	First Day of Classes
September 10, 2018	M	Last Day to Add/Drop Classes
November 12, 2018	M	Last Day to Withdraw
November 20, 2018	T	Thursday Classes Meet
November 21, 2018	W	Friday Classes Meet
November 22 - 25, 2018	R - Su	Thanksgiving Recess
December 12, 2018	W	Last Day of Classes
December 13 & 14, 2018	R & F	Reading Days
December 15 - 21, 2018	Sa - F	Final Exam Period

Course Outline

Lecture	Sections	Topic	Assignment
1	2.1,	Statistical data summary,	2.1, 2.3, 2.4, 2.15, 2.16, 2.34, 2.36, 2.38c, 2.40d
	2.2, 2.3	Stem-and-Leaf Diagram,	
	2.4	Box Plots, etc.	
2	3.1	Random Variables	3.12, 3.15, 3.16, 3.17, 3.18
	3.2	Probability Overview	
	3.3		

3		**QUIZ #1:**	3.91, 3.94, 3.95, 3.96, 3.99
	3.7.1 3.7.2	Random Variable, Discrete Random Variable	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.
4	3.8	Binomial Distribution,	3.107, 3.110, 3.111, 3.118
	3.9.1	Poisson Distribution,	3.122, 3.123, 3.124
	3.9.2	Exponential Distribution	3.136, 1.137, 3.141
5	3.4	Probability Density Function, Mean and Variance of Continuous Distribution function	3.21abc, 3.24, 3.27, 3.29, 3.34, 3.35
6		**MIDTERM EXAM #1** ****** MIDTERM TEST 1 COVERS FIRST 5 CLASS SESSIONS *****	
	3.5.1	Normal Distribution Function	
7	3.5.2	Normal Distribution (Continued)	3.43, 3.45, 3.47, 3.50, 3.54
8		**QUIZ #2:**	
	3.6.1	Normal Probability Plot	3.83, 3.84
	3.1	Normal Approximation to Binomial and Poisson distributions	3.147, 3.148, 3.150
9	3.13	Point Estimates, Distribution of Sample Mean; Central Limit Theorem	3.195, 3.199, 3.200, 3.203, 3.204
10	4.1–4.2, 4.4.5, 4.5.3	Confidence Intervals, Choice of Sample Size	4.36, 4.39d, 4.42d, 4.53c, 4.54c, and 4.60d
11		**REVIEW SESSION MIDTERM EXAM #2** ****** MIDTERM TEST 2 COVERS CLASS SESSIONS 6 THRU 10 ******	
12	4.3, 4.4	Intro to Hypothesis Testing on the Mean	4.37a, 4.38a (use rejection regions), 4.40a (use rejection regions), 4.42a
13	4.3,	P-values; t-test	4.37bc, 4.39a, 4.40a, 4.41a, 4.42b, 4.43a
	4.4	Type I and Type II error,	Assume underlying data is normally distributed: 4.59b, 4.60b, 4.62b, 4.65a, 4.39c, 4.41b, 4.42b
14	4.5,	**QUIZ #3:**	
	4.7	Tests on a Population	4.75abd, 4.82, 4.83ab, 4.87a
		Proportion and t-test	
	└▶	**REVIEW FOR FINAL EXAM**	
		FINAL EXAM - DATE: TBD	Covers Chapters 2, 3, and 4.