



THE COLLEGE OF SCIENCE  
AND LIBERAL ARTS

THE DEPARTMENT OF MATHEMATICAL SCIENCES

## MATH 333: Probability and Statistics

### *Summer 2021 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.

DMS Online Exam Policy Summer 2021: Exams will be proctored using both Respondus LockDown Browser+Monitor and Webex. Students will be required to join a Webex meeting from their phone with their cameras on, and to access the exam through LockDown Browser on a Mac or Windows PC with webcam. Students must follow all instructions related to environment checks and camera positioning.

### COURSE INFORMATION

**Course Description:** Descriptive statistics and statistical inference. Topics include discrete and continuous distributions of random variables, statistical inference for the mean and variance of populations, and graphical analysis of data.

**Number of Credits:** 3

**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 333-040	Professor J. Porus
Math 333-140	Professor K. Carfora

**Office Hours for All Math Instructors:** [Summer 2021 Office Hours and Emails](#)

**Required Textbook:**

<b>Title</b>	<i>Applied Statistics and Probability for Engineers</i>
<b>Author</b>	Montgomery and Runger
<b>Edition</b>	7th
<b>Publisher</b>	John Wiley & Sons
<b>ISBN #</b>	978-1119409533 (Text) 978-1119400226 (Standalone WileyPlus Registration Card)

**Withdrawal Date:** Please see the [Summer 2021 Academic Calendar](#) for the last day to withdraw based on the summer session you are registered for.

## COURSE GOALS

**Course Objectives:** The objective of this course is to acquaint students with probability, descriptive statistics and statistical inference and demonstrate real world applications using examples drawn from various fields.

### Course Outcomes

- Demonstrate understanding of various statistical terms and methods for summarizing, organizing, and presenting data.
- Compute measures of central tendency, position, and variability and interpret them.
- Describe sample space and events and demonstrate their knowledge of various counting techniques, notions of probability, random variables and various discrete and continuous probability distributions.
- Demonstrate conceptual understanding of sampling distributions and the central limit theorem.
- Perform statistical analysis, such as estimation, hypothesis testing, regression, and draw conclusions.

**Course Assessment:** The assessment tools used will include weekly homework assignments/quizzes, one midterm exam and a final exam.

## 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 and Quizzes	25%
Common Midterm Exam	35%
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 and Quiz Policy:** Weekly Homework will be assigned from textbook and additional sources, and completed using WileyPlus online software. Additionally, Quizzes will be given during class.

**Exams:** There will be one common midterm exam held during the semester and one comprehensive common final exam. Exams are held on the following days:

Common Midterm Exam	June 23, 2021
Final Exam	July 19, 2021

**Makeup Exam Policy:** To properly report your absence from a midterm or final exam, please review and follow

the required steps under the DMS Examination Policy found here:

- [http://math.njit.edu/students/policies\\_exam.php](http://math.njit.edu/students/policies_exam.php)

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.

There will be NO MAKE-UP EXAMS during the semester. In the event the Final Exam is not taken, under rare circumstances where the student has a legitimate reason for missing the final exam, a makeup exam will be administered by the math department. In any case the student must notify the Math Department Office and the Instructor that the exam will be missed 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.

**Online Classes:** Note that due to the coronavirus pandemic, all lectures and office hours will be held virtually through Webex sessions. All quizzes and exams will be administered through canvas.njit.edu (See "Technology" below for needed requirements).

**Technology:** Students should become comfortable with the use of technology. This course will require online exams to be proctored via a working Webcam, microphone, and lockdown browser. Additionally, handwritten work will be required to be submitted via clear photos, combined together into a single PDF.

**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, Room G11 (See: [Summer 2021 Hours](#))

**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](tel:973-596-5417) or via email at [lyles@njit.edu](mailto:lyles@njit.edu). The office is located in Fenster Hall Room 260. 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:

- <https://www.njit.edu/studentssuccess/accessibility/>

**Important Dates** (See: [Summer 2021 Academic Calendar](#), Registrar)

Date	Event
May 24, 2021	First Day of Classes for <b>FIRST, MIDDLE, AND FULL SUMMER SESSIONS</b>
May 26, 2021	Last Day to Add/Drop Classes for <b>FIRST SUMMER SESSION</b>
May 28, 2021	Last Day to Add/Drop Classes for <b>MIDDLE SUMMER SESSION</b>
May 31, 2021	Last Day to Add/Drop Classes for <b>FULL SUMMER SESSION</b>
May 31, 2021	University Closed for Memorial Day
June 28, 2021	Last Day of <b>FIRST SUMMER SESSION</b>
July 4, 2021	University Closed for Independence Day
July 5, 2021	University Closed for Independence Day
July 7, 2021	First Day of <b>FTF SUMMER SESSION</b>
July 19, 2021	Last Day of <b>MIDDLE SUMMER SESSION</b>

August 2, 2021	Last Day of FULL SUMMER SESSION
August 16, 2021	Last Day of FTF SUMMER SESSION

## Course Outline

Week	Section	Topic
WEEK 1	6.1-6.4	Descriptive Statistics: Stem-and-leaf, Histograms, Mean, Median, Variance and Standard Deviation, Boxplot
	2.1-2.4 2.5-2.6	Probability: Sample Space, Events, Interpretations of Probability, Addition Rules and Conditional Probability, Multiplication Rule
WEEK 2	2.5-2.7	Total Probability Rules, Independence, Bayes' Theorem
WEEK 3	3.1-3.5	Discrete Random Variables: Probability Mass Function, Cumulative Distribution Function, Mean and Variance of a Discrete Random Variable, Uniform Distribution
	3.6-3.9	Discrete Distributions: Binomial, Geometric, Poisson
WEEK 4	4.1-4.3 4.4-4.5	Continuous Random Variables: PDF and CDF Mean and Variance of a Continuous Random Variable, Continuous Uniform Distribution
	4.6, 4.8	Normal Distribution, Exponential Distribution
WEEK 5	4.7, 7.1-7.2	Normal Approximation, Point Estimation, Sampling Distributions and the Central Limit Theorem + Review for Test
<b>MIDTERM EXAM</b>		
WEEK 6	8.1-8.2	Confidence Interval on the Mean of a Normal Distribution, Variance Known - Variance Unknown
	8.3 8.4 9.1	Confidence Intervals on the Variance and Standard Deviation of a Normal Distribution Large Sample Confidence Interval for a Population Proportion; Introduction to Hypothesis Testing
WEEK 7	9.2- 9.4	Tests on the Mean of a Normal Distribution, P- values, Type I and II error
	9.3,9.5	Small Sample Tests on the Mean, Test on a Population Proportion
WEEK 8	10.1 10.4	Tests on the Difference in the Means of Two Normal Distributions, Paired t-test
	11.1- 11.2	Correlation and Simple Linear Regression + Review for Test
<b>FINAL EXAM</b>		