

MATH 244: Introduction to Probability Theory

Fall 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.

COURSE INFORMATION

Course Description: Train students in elementary probability. Topics include basic probability theory in discrete and continuous sample space, conditional probability and independence, Bayes' theorem, random variables and their distributions, joint distributions, expected values and variance, moment generating functions, parametric families of distributions including binomial, multinomial geometric, hypergeometric, exponential, gamma, and normal.

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 244-001	Professor S. Subramanian

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

Required Textbook:

Title	<i>Probability and Statistics for Engineers and Scientists</i>
Author	Walpole
Edition	9th
Publisher	Prentice Hall College Div
ISBN #	0-321629116

University-wide Withdrawal Date: The last day to withdraw with a W is **Wednesday, November 10, 2021**. It will be strictly enforced.

COURSE GOALS

Course Outcomes: On successful completion student will be able to demonstrate understanding of

1. Discrete and continuous random variables and their cumulative distribution function.
2. Joint distributions and marginal and conditional distributions.
3. The Bayes theorem, independence, expectation, and moment generating functions.
4. Distributions such as binomial, multinomial, geometric, Poisson, normal, and gamma.

Course Assessment: Will be based on homework/quizzes, one midterm exam and one 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 & Quizzes	25%
Midterm Exam	40%
Final Exam	35%

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

A	90 - 100	C	68 - 74
B+	85 - 89	D	50 - 67
B	80 - 84	F	0 - 49
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/Quiz Requirements: Homework assignments are due within a week unless announced otherwise by the instructor. Late homework will not be accepted. Attendance at all quizzes and exams is mandatory

Exams: One midterm and one final examination will be given as shown below. The midterm exam date is tentative and may be subject to change.

Midterm Exam	October 25, 2021
Final Exam Period	December 15 - 21, 2021

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 2021 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 contact Scott Janz, Associate Director of Disability Support Services at **973-596-5417** or via email at **scott.p.janz@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/studentsuccess/accessibility/>

Important Dates (See: **Fall 2021 Academic Calendar, Registrar**)

Date	Day	Event
September 1, 2021	Wednesday	First Day of Classes
September 4, 2021	Saturday	Saturday Classes Begin
September 6, 2021	Monday	Labor Day
September 8, 2021	Wednesday	Monday Classes Meet
September 8, 2021	Wednesday	Last Day to Add/Drop Classes
November 10, 2021	Wednesday	Last Day to Withdraw
November 25 to November 28, 2021	Thursday to Sunday	Thanksgiving Recess - Closed
December 10, 2021	Friday	Last Day of Classes
December 13 and December 14, 2021	Monday and Tuesday	Reading Days

December 15 to December 21, 2021	Wednesday to Tuesday	Final Exam Period
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Course Outline

Week	Lecture	Sections	Topic
1	9/2 (R)	2.1-2.3	Sample space, events, Counting
2	9/6 (M)	2.1-2.3	Counting - continued
2	9/9 (R)	2.4	Probability of an Event
3	9/13 (M)	2.5	Additive Rules
3	9/16 (R)	2.6	Conditional Probability, Independence
4	9/20 (M)	2.6	Product Rules
4	9/23 (R)	2.7-2.8	Bayes Rule
5	9/27 (M)	3.1	Concept of Random Variable
5	9/30 (R)	3.2	Discrete Probability Distributions
6	10/4(M)	3.3	Continuous Probability Distributions
6	10/7 (R)	3.3	Continuous Probability Distributions - continued
7	10/11 (M)	3.4-3.5	Joint Probability Distributions
7	10/14 (R)	3.4-3.5	Joint Probability Distributions - continued
8	10/18 (M)	4.1-4.3	Mean and Variance of Random Variable
8	10/21 (R)	4.1-4.2	Review for Midterm
9	10/25 (M)	4.3	Midterm Exam, Monday, October 25, 2021
9	10/28 (R)	5.1-5.2	Binomial Distribution
10	11/1 (M)	5.3	Hypergeometric Distribution
10	11/4 (R)	5.4	Negative Binomial Distribution
11	11/8 (M)	5.5-5.6	Poisson Distribution and Process
11	11/11 (R)	5.5-5.6	Poisson Distribution and Process -- continued
12	11/15 (M)	6.1-6.3	Continuous Uniform and Normal
13	11/18 (R)	6.1-6.3	Continuous Uniform and Normal - continued
13	11/22 (M)	6.4-6.5	Normal Approximation to Binomial

14	11/29 (M)	6.6	Gamma and Exponential distributions
14	12/2 (R)	7.1-7.3	Transformations and moment generating functions
15	12/6 (M)	7.1-7.3	Transformations and moment generating functions -- continued
15	12/9 (R)		Review

*Updated by Professor S. Subramanian - 8/13/2021
Department of Mathematical Sciences Course Syllabus, Fall 2021*