

MATH 105: Elementary Probability and Statistics

Fall 2022 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: Consider notions of probability. Topics include the binomial and normal distributions, expected value, and variance. The notions of sampling, hypothesis testing, and confidence intervals are applied to elementary situations.

Number of Credits: 3

Prerequisites: None.

Course-Section and Instructors:

| Course-Section | Instructor |
|----------------|--------------------------------|
| Math 105-101 | Professor M. Hercules Menjivar |

Office Hours for All Math Instructors: [Fall 2022 Office Hours and Emails](#)

Required Textbook:

| | |
|-----------|---------------------------------------|
| Title | <i>Understanding Basic Statistics</i> |
| Author | Brase and Brase |
| Edition | 8th |
| Publisher | Cengage |
| ISBN # | 978-1337888981 |

University-wide Withdrawal Date: The last day to withdraw with a **M** is **Monday, November 14, 2022**. It will be strictly enforced.

COURSE GOALS

Course Objectives

The objective of this course is to acquaint students with basic concepts and methods in statistics and probability and demonstrate real world applications using examples drawn from various fields. Topics to be covered include sampling, descriptive statistics, correlation and regression, notions of probability, binomial and normal distributions, estimation and hypothesis testing.

Course Outcomes

Upon successful completion of this course, the student will be able to -

- Demonstrate their understanding of various statistical terms, types of data, and data collection methods
- Efficiently summarize, organize, and present data
- Effectively compute measures of central tendency, position, and variation and interpret the results
- Demonstrate their understanding of notions of probability and distributions
- Perform statistical analysis, such as estimation, hypothesis testing, correlation and regression and draw conclusions
- Apply statistical reasoning to real world problems and make informed decisions

Course Assessment: The assessment tools used will include class participation, homework assignments, quizzes, two midterm exams, and a cumulative/ comprehensive 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:

| | |
|------------------|-----|
| Quizzes | 10% |
| Midterm Exam I | 20% |
| Midterm Exam II | 20% |
| Midterm Exam III | 20% |
| Final Exam | 30% |

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: Homework will be assigned every week at the completion of each topic. A weekly quiz will be given in class to make sure you are keeping up with the homework. There will be no makeups for missed quizzes.

Exams: There will be three midterm exams held in class during the semester and one comprehensive final exam. Exams are held on the following days:

| | |
|-------------------|------------------------|
| Midterm Exam I | Week 4 |
| Midterm Exam II | Week 8 |
| Midterm Exam III | Week 12 |
| Final Exam Period | December 16 - 22, 2022 |

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 2022 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](tel: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.

Important Dates (See: [Fall 2022 Academic Calendar, Registrar](#))

| Date | Day | Event |
|------|-----|-------|
|------|-----|-------|

| | | |
|-------------------------------------|------------------------|------------------------------|
| September 5, 2022 | Monday | Labor Day |
| September 6, 2022 | Tuesday | First Day of Classes |
| September 12, 2022 | Monday | Last Day to Add/Drop Classes |
| November 14, 2022 | Monday | Last Day to Withdraw |
| November 22, 2022 | Tuesday | Thursday Classes Meet |
| November 23, 2022 | Wednesday | Friday Classes Meet |
| November 24 to November 25, 2022 | Thursday and Friday | Thanksgiving Recess - Closed |
| November 26, 2022 | Saturday | Saturday Classes Meet |
| December 14, 2022 | Wednesday | Last Day of Classes |
| December 15, 2022 | Thursday | Reading Day |
| December 16 to December 22, 2022 | Friday to Thursday | Final Exam Period |

Course Outline

| Week # | Sections | Topics |
|--------|----------|----------------------------|
| 1 | 1.1-1.3 | Statistics and Sampling |
| | 1.1-1.3 | |
| 2 | 2.1-2.3 | Organizing Data |
| | 2.1-2.3 | |
| 3 | 3.1-3.3 | Averages and Variation |
| | 3.1-3.3 | |
| 4 | | Midterm Exam 1 |
| 5 | 4.1-4.2 | Correlation and Regression |
| | 4.1-4.2 | |
| 6 | 5.1-5.3 | Probability Theory |

| | | |
|------------------|---------|---|
| | 5.1-5.3 | |
| 7 | 6.1-6.3 | Binomial Distribution |
| | 6.1-6.3 | |
| 8 | | Midterm II |
| 9 | 7.1-7.3 | Normal Curves |
| | 7.1-7.3 | |
| 10 | 7.4-7.5 | Sampling Distribution |
| | 7.4-7.5 | |
| 11 | 7.6 | Normal Approximation to the Binomial Distr. |
| | 8.1-8.2 | Estimating the Mean |
| 12 | | Midterm III |
| 13 | 8.3 | Estimating Proportions |
| | 9.1 | Hypothesis Testing |
| 14 | 9.2 | Testing the Mean |
| | 9.3 | Testing a Proportion |
| 15 | | Distorting and Lying with Statistics |
| | | FINAL EXAM REVIEW |
| EXAM WEEK | 1.1-9.3 | FINAL EXAM (CUMULATIVE) |

*Updated by Professor M. Hercules-Menjivar - 7/7/2022
Department of Mathematical Sciences Course Syllabus, Fall 2022*