

## MATH 661: Applied 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:** Role and purpose of applied statistics. Data visualization and use of statistical software used in course. Descriptive statistics, summary measures for quantitative and qualitative data, data displays. Modeling random behavior: elementary probability and some simple probability distribution models. Normal distribution. Computational statistical inference: confidence intervals and tests for means, variances, and proportions. Linear regression analysis and inference. Control charts for statistical quality control. Introduction to design of experiments and ANOVA, simple factorial design and their analysis.

**Number of Credits:** 3

**Prerequisites:** MATH 112

**Course-Section and Instructors:**

Course-Section	Instructor
Math 661-107	Professor A. Pole

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

**Required Textbook:**

Title	<i>Introduction to the Practice of Statistics</i>
Author	Edition. D.S. Moore, G.P. McCabe and B. Craig
Edition	10th
Publisher	MacMillan Learning
ISBN #	1. E-book ISBN:9781319377656 2. Loose-Leaf ISBN:9781319383985 3. Paperback ISBN:9781319244446

\*\* We will be using the MacMillan Achieve product for some assignments - *you will need to purchase access to Achieve (which includes the eBook, solutions manual, applets for practicing tools, exercises with feedback).*

**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:

- This course will acquaint students with statistical techniques, with emphasis on applications: Turning data into information.
- Assessment of objectives is achieved through homework assignments and two examinations: a midterm exam and a comprehensive final exam.

### Course Outcomes

On successful completion of this course, the student will be able to:

- Explain and apply statistical methods for displaying, summarizing and describing data
- Explain and perform basic probability calculations
- Define and explain sampling distributions and the central limit theorem
- Perform statistical calculation of sampling distributions
- Perform statistical analysis including estimation, hypothesis testing, and analysis of variance
- Communicate results of data examination, analysis, and inference.

## 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:

<b>Homework and Assignments</b>	40%
<b>Midterm Exam</b>	30%
<b>Final Exam</b>	30%

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

<b>A</b>	90 - 100	<b>C+</b>	60 - 69
<b>B+</b>	80 - 89	<b>C</b>	50 - 59
<b>B</b>	70 - 79	<b>F</b>	0 - 49

**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.

**Exams:** There will be one exam during the semester and a cumulative final exam:

Midterm Exam	Week 8
Final Exam	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.

## ADDITIONAL RESOURCES

**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](mailto: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	Subject Topic
Week 1 09/06/22 - 09/09/22	<i>Chapter 1. Looking at Data Distributions Part 1: Graphs</i>
Week 2 09/12/22 - 09/16/22	<i>Chapter 1. Looking at Data Distributions Part 2: Measurements</i>
Week 3 09/19/22 - 09/23/22	<i>Chapter 2. Looking at Data Relationships</i>
Week 4 09/26/22 - 09/30/22	<i>Chapter 4. Probability: The Study of Randomness Part 1</i>
Week 5 10/03/22 - 10/07/22	<i>Chapter 4. Probability: The Study of Randomness Part 2</i>
Week 6 10/10/22 - 10/14/22	<i>Chapter 5. Sampling Distributions Part 1</i>
Week 7 10/17/22 - 10/21/22	<i>Chapter 5. Sampling Distributions Part 2</i>
Week 8 10/24/22 - 10/28/22	<b>MIDTERM EXAM</b>
Week 9 10/31/22 - 11/04/22	<i>Chapter 6. Introduction to Inference Part 1</i>
Week 10 11/07/22 - 11/11/22	<i>Chapter 6. Introduction to Inference Part 2</i>
Week 11 11/14/22 - 11/18/22	<i>Chapter 7. Inference for Means</i>
Week 12 11/21/22 - 11/25/22	<i>Thanksgiving - No Class</i>
Week 13 11/28/22 - 12/02/22	<i>Chapter 8. Inference for Proportions</i>
Week 14 12/05/22 - 12/09/22	<i>Chapter 9. Inference for Categorical Data</i>
Week 15 12/12/22 - 12/14/22	<i>Chapter 12. One Way Analysis of Variance</i>
Week 16 12/19/22 - 12/23/22	<b>FINAL EXAMS</b> <i>Course exam date and time to be set by the registrar</i>

*Updated by Professor A. Pole - 08/18/2022*  
*Department of Mathematical Sciences Course Syllabus, Fall 2022*