MATH 661: Applied Statistics
Fall 2025 Course Syllabus

NJIT Academic Integrity Code: Academic Integrity is the cornerstone of higher education and is central to the ideals of this course and the university. Cheating is strictly prohibited and devalues the degree that you are working on. As a member of the NJIT community, it is your responsibility to protect your educational investment by knowing and following the academic code of integrity policy that is found at: NJIT Academic Integrity Code.

Please note that it is my professional obligation and responsibility to report any academic misconduct to the Dean of Students Office. Any student found in violation of the code by cheating, plagiarizing or using any online software inappropriately will result in disciplinary action. This may include a failing grade of F, and/or suspension or dismissal from the university. If you have any questions about the code of Academic Integrity, please contact the Dean of Students Office at dos@njit.edu

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 661-851	Professor A. Pole
Math 661-853	Professor A. Pole

Office Hours for All Math Instructors: Office Hours and Emails

Required Textbook:

Title	*Introduction to the Practice of Statistics*
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 **W** is **Monday, November 10, 2025**. It will be strictly enforced.

The course is offered through Canvas. Canvas [accessibility statement](#)

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.

Assignments

Homework assignments will be posted early each week, with the due date set as Tuesday evening of the subsequent week. Assignments are in three parts: two "assignments" and one "discussion". The assignment labeled "A" is an Achieve assignment. Those are largely multiple choice/compute and enter a value/fill in the missing term. Those are graded by the Achieve algorithm. The other assignment requires you to write solutions, scan and convert to pdf, and upload to Canvas for me to grade. The discussion is to get you "talking" with each other about the course material.

For the uploaded assignment responses, PDF format is required. A naming convention is also required:

M661 <LAST NAME>, <FIRST NAME> HW<number>

(Some prefer to upload each question separately – that is a help to me in navigating your work – just be sure to add the question number, something like "Q3", to the file names.)

Assignments will usually be graded by Thursday and marked up files available in Canvas by the end of the day. Solution notes are posted at the same time. The assignments include a substantial amount of practical work – you will need a computing environment to accomplish the tasks. Choice of computational tools is up to you: see the note posted on the Canvas course page.

The weekly homework assignments will include exercises to:

- Practice the tools: including boxplots, histograms, scatterplots for summarizing and displaying data
- Practice the calculations: computing probabilities by applying the rules of probability for dealing with compound events formed by combining simple events; applying the central limit theorem to sample data; compute summary statistics of sampling distributions
- Practice the statistical analysis of single variable data: computing confidence intervals; testing statistical hypotheses
- Practice the statistical analysis of multi-variable data: assessing strength and direction of relationships; comparing data distributions in terms of shape, location, and spread
- Practice the statistical analysis of multi-sample data: computing confidence intervals for differences in means and proportions; testing statistical hypotheses on differences in means and proportions.

Additional, optional, practice with data exploration and analysis tools, statistical analysis tools and inference techniques is available with the course text publisher application Achieve (student subscription required as part of the course).

Discussions

You are required to make an initial contribution by Sunday 11pm of the assignment week, to give others the opportunity to respond before the assignment deadline of Tuesday at 11pm. Instructor replies will be made throughout the discussion.

Questions

Questions about the course or material may be communicated through a Canvas discussion or email. (The Canvas email is preferred over direct NJIT email – an automatically generated course identifier is included.) Email questions are typically answered within 1 business day.

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 Assignments	40%
Midterm Exam	30%
Final Exam	30%

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

A	90 - 100	C+	60 - 69
B+	80 - 89	C	50 - 59
B	70 - 79	F	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.

"NJIT policy requires that all midterm and final exams must be proctored, regardless of delivery mode, in order to increase academic integrity. Note that this does not apply to essay or authentic based assessments. Effective beginning Fall semester 2019, students registered for a fully online course section (e.g., online or Hyflex mode) must be given the option to take their exam in a completely online format, with appropriate proctoring."

In this course, you will be required to use the following proctoring method to ensure academic integrity for exams. Please see NJIT's response to questions about online proctoring here. See below for more information about how exams will be proctored in this course.

Respondus Lockdown Browser and Monitor

Respondus LockDown Browser is a locked browser for taking assessments or quizzes in Canvas. It prevents students from printing, copying, going to another URL, or accessing other applications during a quiz. If a Canvas quiz requires that LockDown Browser be used, students will not be able to take the assessment or quiz with a standard web browser. Students may be required to use LockDown Browser with a webcam (Respondus Monitor), which will record students during an online exam.

The webcam can be built into your computer or can be the type that plugs in with a USB cable. Watch this short video to get a basic understanding of LockDown Browser and the webcam feature. A student Quick Start Guide (PDF) is also available.

Respondus Lockdown Browser and Monitor does not work with Linux and Chromebooks at this time. Please visit the Respondus Knowledge Base article on computer requirements for additional information. There are two quizzing engines currently available in Canvas, "classic" quizzes and "new" quizzes. Respondus works with both.

For "Classic" Quizzes in Canvas:

1. The LockDown Browser integration with Classic Quizzes still requires students to (1) manually start LockDown Browser, (2) log into Canvas, and (3) navigate to the quiz that requires LockDown Browser.
2. Download and install either the Windows version of LockDown Browser or the Mac version of LockDown Browser.
3. Once your download and installation has finished, locate the "LockDown Browser" shortcut on your desktop and double-click it. (For Mac users, launch "LockDown Browser" from the Applications folder.)
4. You will be brought to the Webauth Authentication Service page, where you can log in with your NJIT UCID and password.
5. From your Dashboard or under "Courses", click on the course in which you have to take the exam that requires LockDown Browser.
6. After you enter the course, find the exam and click on it.
7. Click the "Take the Quiz" button. Once a quiz has been started with LockDown Browser, you cannot exit until the "Submit Quiz" button is clicked.
8. If you are required to use a webcam (Respondus Monitor), you will be prompted to complete a Webcam Check and other Startup Sequence steps.

For "New" Quizzes in Canvas:

If a New Quizzes assessment requires the use of LockDown Browser, it will automatically launch from the student's regular browser session. At the end of the quiz, LockDown Browser will close, allowing the student to continue with their standard browser. To be clear, the LockDown Browser application must first be installed to the computer or device. But once installed, it will automatically launch (and close) as needed with New Quizzes.

1. Download and install either the Windows version of LockDown Browser or the Mac version of LockDown Browser.
2. Once your download and installation has finished, log into Canvas using your standard browser.
3. From your Dashboard or under "Courses", click on the course in which you have to take the exam that requires LockDown Browser.
4. After you enter the course, find the exam and click on it.
5. A new tab will open with a message stating "Assessment Loading". You will also see a pop-up window asking you to open Lockdown Browser. Click "Open Lockdown Browser".
6. Lockdown Browser will automatically launch and your quiz will be loaded into Lockdown Browser. Click "Begin"

to take the quiz. Once a quiz has been started with LockDown Browser, you cannot exit until the "Submit Quiz" button is clicked.

7. If you are required to use a webcam (Respondus Monitor), you will be prompted to complete a Webcam Check and other Startup Sequence steps.

More information and tips for ensuring a smooth experience can be found on this page.

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

Midterm Exam	Week 8
Final Exam	Scheduled by the registrar (Exam Week)

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.

Online Etiquette: Throughout this course, you are expected to be courteous and respectful to classmates by being polite, active participants. You should respond to discussion forum assignments in a timely manner so that your classmates have adequate time to respond to your posts. Please respect opinions, even those that differ from your own, and avoid using profanity or offensive language.

Religious Observance: NJIT is committed to supporting students observing religious holidays. Students must notify their instructors in writing of any conflicts between course requirements and religious observances, ideally by the end of the second week of classes and no later than two weeks before the anticipated absence.

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 need an accommodation due to a disability, please contact the Office of Accessibility Resources and Services at oars@njit.edu, or visit Kupfrian Hall 201 to discuss your specific needs. A Letter of Accommodation Eligibility from the office authorizing student accommodations is 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/accessibility/

Important Dates (See: Fall 2025 Academic Calendar, Registrar)

Date	Day	Event

September 1, 2025	Monday	Labor Day
September 2, 2025	Tuesday	First Day of Classes
September 8, 2025	Monday	Last Day to Add/Drop Classes
November 10, 2025	Monday	Last Day to Withdraw
November 25, 2025	Tuesday	Thursday Classes Meet
November 26, 2025	Wednesday	Friday Classes Meet
November 27 to November 30, 2025	Thursday to Sunday	Thanksgiving Recess - Closed
December 11, 2025	Thursday	Last Day of Classes
December 12, 2025	Friday	Reading Day 1
December 13, 2025	Saturday	Saturday Classes Meet
December 14 to December 20, 2025	Sunday to Saturday	Final Exam Period

Course Outline

*Homework assignments will be posted each week, with the due date set as Tuesday evening of the subsequent week.

For most discussions (unless noted otherwise), initial replies are due on Sundays at 11 pm and responses to classmates due on Tuesday at 11 pm (for example, in Week 2, initial replies are due on 9/17 and responses to classmates on 9/19).

Week	Subject Topic	Assignment Schedule*
Week 1 09/02/25-09/05/25	*Chapter 1. Looking at Data Distributions Part 1: Graphs*	Assignment #1, #1A, Discussion #1 posted Tuesday; due date 9/9 at 11 pm (Tuesday of Week 2)
Week 2 09/08/25-09/12/25	*Chapter 1. Looking at Data Distributions Part 2: Measurements*	Assignment #2, #2A, Discussion #2 posted Tuesday; due date 9/16 at 11 pm (Tuesday of Week 3)
Week 3 09/15/25-09/219/25	*Chapter 2. Looking at Data Relationships*	Assignment #3, #3A, Discussion #3 posted Tuesday; due date 9/23 at 11 pm (Tuesday of Week 4)
Week 4 09/22/25-09/26/25	*Chapter 4. Probability: The Study of Randomness Part 1*	Assignment #4, #4A, Discussion #4 posted Tuesday; due date 9/30 at 11 pm (Tuesday of Week 5)

Week	Topic	Assignment
Week 5 9/29/25-10/03/25	*Chapter 4. Probability: The Study of Randomness Part 2*	Assignment #5, #5A, Discussion #5 posted Tuesday; due date 10/7 at 11pm (Tuesday 11pm of Week 6).
Week 6 10/06/25-10/10/25	*Chapter 5. Sampling Distributions Part 1*	Assignment #6, #6A, Discussion #6 posted Tuesday; due date 10/14 at 11 pm (Tuesday of Week 7)
Week 7 10/13/25-10/17/25	*Chapter 5. Sampling Distributions Part 2*	Discussion #7 posted Tuesday; due date 10/21 at **5 pm** (Tuesday of Week 8) *Discussion only this week: Midterm next week!*
Week 8 10/20/25-10/24/25	*MIDTERM EXAM*	Assignment #7, #7A, posted Tuesday; due date 10/28 at 11 pm (Tuesday of Week 9)
Week 9 10/27/25-10/31/25	*Chapter 6. Introduction to Inference Part 1*	Assignment #8, #8A, Discussion #8 posted Tuesday; due date 11/4 at 11 pm (Tuesday of Week 10)
Week 10 11/03/25-11/07/25	*Chapter 6. Introduction to Inference Part 2*	Assignment #9, #9A, Discussion #9 posted Tuesday; due date 11/11 at 11 pm (Tuesday of Week 11)
Week 11 11/10/25-11/14/25	*Chapter 7. Inference for Means*	Assignment #10, #10A, Discussion #10 posted Tuesday; due date 11/18 at 11 pm (Tuesday of Week 12)
Week 12 11/17/25-11/21/25	*Chapter 8. Inference for Proportions*	Assignment #11, #11A, Discussion #11 posted Tuesday; due date 12/02 at 11 pm (Tuesday of Week 14)
Week 13 11/24/25-11/28/25	*Thanksgiving - No Class*	*No assignment*
Week 14 12/01/25-12/05/25	*Chapter 9. Inference for Categorical Data*	Assignment #12, #12A, Discussion #12 posted Tuesday; due date 12/9 at 11 pm (Tuesday of Week 15)
Week 15 12/08/25-12/12/25	*Chapter 12. One Way Analysis of Variance*	Discussion #13 posted Tuesday; due date 12/16 at **5 pm** (Monday of Week 16) *Discussion only this week: Final next week!*
Week 16 12/14/25-12/20/25	*FINAL EXAMS* *Course exam date and time to be set by the registrar*	

*Note that the two lowest homework assignment grades are excluded from the calculation of the course grade.