MATH 678: Stat Methods in Data Science
Spring 2026 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

Please be sure you read and fully understand our DMS Online Exam Policy.

COURSE INFORMATION

Course Description: This course introduces students to concepts in statistical methods used in data science, including data collection, data visualization and data analysis. Emphasis is on model building and statistical concepts related to data analysis methods. The course provides the basic foundational tools on which to pursue statistics, data analysis and data science in greater depth. Topics include sampling and experimental design, understanding the aims of a study, principles of data analysis, linear and logistic regression, resampling methods, and statistical learning methods. Students will use the R statistical software.

Number of Credits: 3

Prerequisites: MATH 661 or MATH 663, or permission by instructor.

Course-Section and Instructors:

Course-Section	Instructor
Math 678-102	Professor Y. Sun

Office Hours for All Math Instructors: Spring 2026 Office Hours and Emails

Required Textbook:

Title	*An Introduction to Statistical Learning: with Applications in Python*
Author	Gareth James, et al

Edition	1st (2023)
Publisher	Springer
ISBN #	ISBN-13: 9783031387463

University-wide Withdrawal Date: The last day to withdraw with a **W** is **Monday, April 6, 2026**. It will be strictly enforced.

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	25%
Project	20%
Midterm Exam	25%
Final Exam	30%

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

A	90 - 100	**C+**	75 - 79
B+	85 - 89	**C**	70 - 74
B	80 - 84	**F**	0 - 69

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.

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.

Cheating in Exams: Once caught, the exam will be assigned zero points. To prevent cheating, please leave at least one seat empty between you and your neighbors.

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

Midterm Exam	March 11, 2026
Final Exam Period	May 8 - May 14, 2026

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

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 If you need an accommodation due to a disability please contact the Office of Accessibility Resources and Services at oars@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/accessibility/

Important Dates (See: Spring 2026 Academic Calendar, Registrar)

Date	Day	Event
January 20, 2026	Tuesday	First Day of Classes
January 26, 2026	Monday	Last Day to Add/Drop Classes
March 15, 2026	Sunday	Spring Recess Begins
March 21, 2026	Saturday	Spring Recess Ends
March 26, 2026	Thursday	AI Exploration Day
April 3, 2026	Friday	Good Friday - No Classes
April 6, 2026	Monday	Last Day to Withdraw
May 5, 2026	Tuesday	Friday Classes Meet
May 5, 2026	Tuesday	Last Day of Classes
May 6, 2026	Wednesday	Reading Day 1

May 7, 2026	Thursday	Reading Day 2
May 8 - May 14, 2026	Friday to Thursday	Final Exam Period

Course Outline

Date	Lecture	Sections	Topic	Assignment
Week 1 1/21	1	Chapter 1	**Introduction to Data Science**	
Week 2 1/28	2	Chapter 2	**Statistical Learning; KNN**	
Week 3 2/4	3	Chapter 3	**Linear Regression**	Homework 1
Week 4 2/11	4	Chapter 4	**Logistic Regression**	
Week 5 2/18	5	Chapter 4	**LDA, QDA,Navie Bayes, Generalized Linear Model**	Homework 2
Week 6 2/25	6	Chapter 5	**Cross-Validation and Bootstrap**	
Week 7 3/4	7	Chapter 6	**Linear Model Selection; Shrinkage Methods and Dimension Reduction Method**	
Week 8 3/11			**MIDTERM EXAM: Wednesday ~ March 11, 2026**	
Week 9 3/18			**SPRING RECESS (NO CLASSES)**	
Week 10 3/25	8	Chapter 7	**Nonlinear Modeling**	Homework 3, Course Project
Week 11 4/1	9	Chapter 8	**Tree-Based Methods: Bagging, Random Forests, Boosting**	
Week 12 4/8	10	Chapter 9	**Support Vector Machines**	Homework 4
Week 13 4/15	11	Chapter 12	**Unsupervised Learning**	
Week 14 4/22	12	Chapter 10	**Deep Learning**	Homework 5
Week 15 4/29			**Student Project Presentation**	
Week 16 5/6			**Student Project Presentation**	
Week 17			**FINAL EXAM: May 13, 20266:00pm-8:50pm**	
