

THE DEPARTMENT OF MATHEMATICAL SCIENCES

Math 478: Statistical Methods in Data Science *Fall 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 Code of Student Conduct and Academic Integrity Policy that is found at: [Code of Student Conduct and Academic Integrity Policy](#).

Please note that I am required to report any suspected academic misconduct to the Office of the Dean of Students. Academic misconduct includes, but is not limited to, cheating, plagiarism, and the inappropriate use of online tools or software. Students who are found responsible for violating the Academic Integrity Code may be subject to disciplinary action. Possible outcomes can include a failing grade on an assignment or in the course, as well as additional sanctions up to and including suspension or dismissal from the university. If you have questions about the Code of Student Conduct and Academic Integrity or the student conduct process, you may contact communitystandards@njit.edu.

COURSE INFORMATION

Course Description: This course introduces students to fundamental concepts and methods in statistical learning and their applications to data science. Emphasis is placed on statistical modeling, prediction, classification, model assessment, and the analysis of real-world data. Topics include linear and logistic regression, resampling methods, model selection and regularization, nonlinear modeling, tree-based methods, support vector machines, and unsupervised learning. Students will use **R** for statistical computing, data visualization, model building, and implementation of statistical learning methods.

Number of Credits: 3

Prerequisites: **Math 333** with a grade of C or better or **Math 341** with a grade of C or better.

Course-Section and Instructors:

Course-Section	Instructor
Math 478-001	Professor W. Guo

Office Hours for All Math Instructors: [Fall 2026 Office Hours and Emails](#)

Required Textbook:

Title	<i>An Introduction to Statistical Learning: with Applications in R</i>
Author	Gareth James, Daniela Witten, Trevor Hastie, Robert Tibshirani

Edition	2nd ed. 2021 edition
Publisher	Springer
ISBN #	9781071614174

University-wide Withdrawal Date: The last day to withdraw with a W is **Tuesday, November 10, 2026**. It will be strictly enforced.

Homework: There will be seven or eight homework assignments. Late homework will be accepted for up to one week after the due date, subject to a late penalty. For problems requiring the use of R, please submit your R code and any relevant figures along with your answers.

Course Project: There will be a course project consisting of a written report and an in-class presentation. Students will work in groups of two to complete the project collaboratively.

Midterm Exam: There will be an in-class midterm exams during the semester, which will be held on the following days:

Midterm Exam	Oct 23, 2025
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Final Exam: There will be a final exam, which will be held during the Finals week:

Final Exam Period	Dec 16 - 22, 2026
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More introductions will be given in due time.

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:

Attendance	5%
Homework	25%
Course Project	15%
Midterm Exam	25%
Final Exam	30%

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 class sessions is **mandatory** and will be recorded based on sign-in and sign-out times. Attendance accounts for **5% of the final course grade**. Students are expected to remain in class for the entire class period. Signing in or out without attending the class, or leaving early without permission, will not be counted as attendance. Please make sure you read and fully understand the **Math Department's Attendance Policy**.

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.

Makeup Exam Policy: There will be **NO MAKE-UP 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 2026 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 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/>

Generative AI: Students may utilize generative AI tools (e.g., ChatGPT, Bard, DALL.E, etc.) in this course for certain assignments and activities. It is not permitted to be used in assignments including but not limited to homework and course projects, as doing so would undermine student learning and achievement of course learning outcomes. Additionally, if and when students use AI in this course, the AI must be cited as shown within the **NJIT Library AI citation page** for AI. If you have any questions or concerns about AI technology use in this class, please reach out to the instructor prior to submitting any assignments.

Student Absences for 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. For questions or additional guidance, please [review the policy](#) or contact the Office of Inclusive Excellence at inclusivexcellence@njit.edu.

Important Dates: (See: [Fall 2026 Academic Calendar, Registrar](#))

Date	Day	Event
September 1, 2026	Tuesday	First Day of Classes
September 5, 2026	Saturday	Saturday Classes Begin
September 7, 2026	Monday	Labor Day. University Closed
September 8, 2026	Tuesday	Last Day to Add/Drop Classes
September 8, 2026	Tuesday	Conversion Day - Monday Classes Meet
October 2, 2026	Friday	Wellness Day
November 10, 2026	Tuesday	Last Day to Withdraw
November 25, 2026	Wednesday	Conversion Day - Friday Classes Meet
November 26 to November 29, 2026	Thursday and Sunday	Thanksgiving Recess - Closed
December 11, 2026	Friday	Friday Classes Meet - Make up day for Wellness Day
December 12, 2026	Saturday	Saturday Classes Meet
December 13, 2026	Sunday	Last Day of Classes
December 14, 2026	Monday	Reading Day 1
December 15, 2026	Tuesday	Reading Day 2
December 16 to December 22, 2026	Wednesday to Tuesday	Final Exam Period

Course Outlines

Weeks	Chapters	Topics
Week 1 (09/01)	Chapter 1	Introduction to Data Science
Week 2 (09/08)	Chapter 2	Statistical Learning; kNN
Week 3	Chapter 3	Linear Regression

(09/15)		
Week 4 (09/22)	Chapter 4	Logistic Regression
Week 5 (09/29)	Chapter 4	LDA; QDA; Naive Bayes; Generalized Linear Models 10/02: Wellness Day – No Class
Week 6 (10/06)	Chapter 5	Cross-Validation and Bootstrap
Week 7 (10/13)	Chapter 6	Linear Model Selection
Week 8 (10/20)	Chapter 6	Shrinkage Methods and Dimension Reduction Methods Review for Midterm Exam Midterm Exam: 10/23
Week 9 (10/27)	Chapter 7	Nonlinear Modeling
Week 10 (11/03)	Chapter 7	Smoothing Splines, Generalized Additive models
Week 11 (11/10)	Chapter 8	Tree-Based Methods
Week 12 (11/17)	Chapter 8	Bagging, Random Forests, Boosting
Week 13 (11/24)	Chapter 9	Support Vector Machines 11/25: Conversion Day – Friday Classes Meet 11/27: Thanksgiving Recess – No Class
Week 14 (12/01)	Chapter 12	Unsupervised Learning
Week 15 (12/08)		Review for Final Exam Course Project Presentations

*Updated by Professor W. Guo - August 24, 2026
Department of Mathematical Sciences Course Syllabus, Fall 2026*