Fall 2019

MATH 344-001: Regression Analysis

J. M. Loh

NJIT New Jersey's Science & Technology University

THE COLLEGE OF SCIENCE AND LIBERAL ARTS

THE DEPARTMENT OF MATHEMATICAL SCIENCES

MATH 344: Regression Analysis
Fall 2019 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: This course introduces the methods for fitting and interpreting regression models. Topics include ordinary least squares, inference for the Normal regression model, model diagnostics and test of fit, transformation of data, qualitative predictors, effects of measurement error, and model selection.

Number of Credits: 3

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

Course-Section and Instructors

Course-Section	Instructor
Math 344-001	Professor J. M. Loh

Office Hours for All Math Instructors: Fall 2019 Office Hours and Emails

Required Textbook:

Title	*Applied Linear Regression Models*
Author	Kutner, Nachtsheim and Neter
Edition	4th
Publisher	McGraw-Hill
ISBN #	0-072386916

University-wide Withdrawal Date: The last day to withdraw with a **W** is **Monday, November 11, 2019**. 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:

Assignments	20%
2 **Midterm Exams**	45%
Final Exam	35%

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

A	90 - 100	**C**	50 - 59
B+	80 - 89	**D**	40 - 49
B	70 - 79	**F**	0 - 39
C+	60 - 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. This policy will be strictly enforced. Regular attendance is expected.

HOMEWORK POLICY: No late homework will be accepted.

Exams: There will be one midterm exams (in-class part plus take-home part) during the semester and one comprehensive final exam (in-class part plus take-home part). Exams are held on the following days:

Midterm Exam I	October 17, 2019 (Tentative)
Midterm Exam II	November 21, 2019 (Tentative)
Final Exam Week	December 14 - 20, 2019

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.

NOTE: the grading scale is tentative and serves only as a guide. The actual grades will be based on curved scores.

IMPORTANT DEPARTMENTAL AND UNIVERSITY POLICIES

- Academic Integrity Code is Strictly Enforced
- Prerequisites Requirements are Enforced
- Attendance is Required in Lower-Division Courses
- Exam Policies (No Make Up Exams and More)
- Cell Phone and Pager Use Prohibited in Class
- Drop Date is Strictly Observed
- Complete DMS Course Policies (math.njit.edu/students/undergraduate/policies_math)

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 2019 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.

All students must familiarize themselves with and adhere to the Department of Mathematical Sciences Course Policies, in addition to official university-wide policies. The Department of Mathematical Sciences takes these policies very seriously and enforces them strictly.

Accommodation of Disabilities: Disability Support Services (DSS) 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 Chantonette Lyles, Associate Director of Disability Support Services at 973-596-5417 or via email at lyles@njit.edu. The office is located in Fenster Hall Room 260. A Letter of Accommodation Eligibility from the Disability Support 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 Disability Support Services (DSS) website at:

- https://www.njit.edu/studentsuccess/accessibility/

Important Dates (See: Fall 2019 Academic Calendar, Registrar)

Date	Day	Event
September 3, 2019	T	First Day of Classes
September 13, 2019	F	Last Day to Add/Drop Classes
November 11, 2019	M	Last Day to Withdraw
November 26, 2019	T	Thursday Classes Meet
November 27, 2019	W	Friday Classes Meet
November 28-29, 2019	R-F	Thanksgiving Recess
December 11, 2019	W	Last Day of Classes
December 12, 13 2019	R & F	Reading Days
December 14-20, 2019	F - R	Final Exam Period

Course Outline

Week	Chapter	Topic (Tentative)
1	1	Introduction to linear regression; Introduction to R statistical software
2	1	Ordinary least squares; parameter estimation; Normal regression model
3	2	Statistical inference review; Inference for the slope
4	2	Inference for regression; Analysis of Variance
5	3	Coefficient of determination; Diagnostics
6	4	Transformations; joint inference
7	4	Regression through the origin; Midterm 1

8	5	Matrices and Matrix representation of simple linear regression
9	6	Multiple regression – model and inference
10	6 - 7	Multiple regression
11	8	Quantitative and qualitative predictors
12	8	Polynomial regression; Midterm 2
13	9	Variable Selection – best subset; Mallows Cp
14	9	Collinearity; Diagnostics and remedial measures
15		Review
16		Final Exam