NJIT New Jersey's Science & Technology University

THE COLLEGE OF SCIENCE AND LIBERAL ARTS

THE DEPARTMENT OF MATHEMATICAL SCIENCES

MATH 344: Regression Analysis
Fall 2020 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 A. Wang

Office Hours for All Math Instructors: Fall 2020 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 9, 2020**. 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 and Quizzes	30%
Midterm Exam	30%
Final Exam	40%

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 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: Homework problems will be assigned in class.

Further Assistance: For further questions, students should contact their Instructor. All Instructors have regular office hours during the week. These office hours are listed at the link above by clicking on the Instructor's name. Teaching Assistants are also available in the math learning center.

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	October 8, 2020
Final Exam Week	December 15 - 21, 2020

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 2020 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 Kupfrian Hall, Room 201. 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 2020 Academic Calendar, Registrar)

Date	Day	Event
September 1, 2020	T	First Day of Classes
September 5, 2020	S	Saturday Classes Begin
September 7, 2020	M	Labor Day
September 8, 2020	T	Monday Classes Meet
September 8, 2020	T	Last Day to Add/Drop Classes
November 9, 2020	M	Last Day to Withdraw
November 25, 2020	W	Friday Classes Meet
November 26-29, 2020	R - Su	Thanksgiving Recess - University Closed
December 10, 2020	R	Last Day of Classes
December 11 & 14, 2020	F & M	Reading Days
December 15 - 21, 2020	T - M	Final Exam Period

Course Outline

Week	Lecture	Chapter	Topic
Week 1 9/3	1	1	Simple Linear Regression Model with distribution of error terms unspecified, Normal Error Regression Model
Week 2 9/7,9/10	2	2	Inferences Concerning Regression Parameters Interval Estimation of mean response Prediction of New Observation

Week 3 9/14,9/17	3	2	Analysis of Variance Approach to Regression General Linear Test Approach Descriptive Measures of Linear Association
Week 4 9/21,9/24	4	3	Diagnostics for Predictor Variable, Residuals Overview of Tests Involving Residuals Test for Constancy of Error Variance, F Test for Lack of Fit Overview of Remedial Measures, Box-Cox Transformations
Week 5 9/28,10/1	5	4	Joint Estimation for Regression Parameters Simultaneous Estimation of Mean Responses Simultaneous Prediction Intervals for New Observations
Week 6 10/5,10/8	6 - 7		**REVIEW FOR MIDTERM EXAM** **MIDTERM EXAM: WEDNESDAY~ OCT 08, 2020**
Week 8 10/12,10/15	8	4	Regression through Origin Effects of Measurement Errors Inverse Predictions
Week 9 10/19,10/22	9	5	Matrices and their Properties Simple Linear Regression Model in Matrix Terms Least Squares Estimation of Regression Parameters
Week 10 10/26, 10/29	10	5	Fitted Values and Residuals Analysis of Variance Results Inferences in Regression Analysis
Week 11 11/2,11/5	11	6	Multiple Regression Models General Linear Model in Matrix Terms Estimation of Regression Coefficients
Week 12 11/9,11/12	12	6	Fitted Values and Residuals Analysis of Variance Results Inferences about Regression Parameters
Week 13 11/17,11/19	13	7	Extra Sums of Squares Summary of Tests Concerning Regression Coefficients
Week 14,15 11/23, 12/3	14	9	Overview of Model-Building Process Final Review