MATH 661: Applied Statistics
Spring 2024 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: 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. Introduction to design of experiments and ANOVA, simple factorial design and their analysis. MATH 661 and MATH 663 cannot both be used toward degree credits at NJIT.

Number of Credits: 3

Prerequisites: MATH 112

Course-Section and Instructors:

Course-Section	Instructor
Math 661-102	Professor T. Falconer

Office Hours for All Math Instructors: email me to set up a zoom meeting

Required Textbook:

Title	*Introduction to the Practice of Statistics*
Author	Moore, McCabe, and Craig
Edition	9th
Publisher	MacMillan Learning
ISBN #	978-1319055967 (e-book) 978-1319013622 (looseleaf)

University-wide Withdrawal Date: The last day to withdraw with a **W** is **Monday, April 1, 2024**. It will be strictly enforced.

COURSE GOALS

Course Objectives

This course will acquaint students with statistical techniques, with emphasis on applications.

Course Outcomes: On successful completion of this course, the student will be able to

1) Demonstrate understanding of various statistical methods for summarizing and displaying data
2) Demonstrate knowledge of probability theory and statistical inference
3) Understand the details of hypothesis testing as well as the knowledge of when to use a particular test for a particular data question.

Course Assessment: The assessment tools used will include online homework assignments, quizzes, mid-term exam, and a comprehensive/cumulative final exam.

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:

Homeworks	20%
Class attendance and participation	15%
Midterm Exam	30%
Final Exam	35%

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

A	90 - 100	**C+**	75 - 79
B+	85 - 89	**C**	60 - 74
B	80 - 84	**F**	0 - 59

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.

Homework and Quiz Requirements: Homework problems will be assigned on Canvas. In addition to the online homeworks there will be Quizzes. Quizzes could be on paper or using an online proctored environment (Lock down browser with Respondus). http://www.respondus.com/lockdown/download.php?id=264548414

Software: We will use R (RStudio) in this class for assignments. Laptop/computer would be needed for this.

Technical Support

Students may contact the IST Service Desk with any questions. Questions or problems can be submitted via web form by going to: https://servicedesk.njit.edu (Links to an external site.) and clicking on the "Report your issue online" link.

You may also call the IST Service Desk with any questions at 973-596-2900.

Exams: There will be a proctored midterm exam during the semester and one cumulative/comprehensive proctored final exam during the final exam week.

Midterm Exam Date	TBD
Final Exam Date	May 3 – May 9, 2024

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 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 unless being used for in-class work.

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 2024 Academic Calendar, Registrar)

Date	Day	Event
January 16, 2024	Tuesday	First Day of Classes
January 22, 2024	Monday	Last Day to Add/Drop Classes
March 10, 2024	Sunday	Spring Recess Begins
March 16, 2024	Saturday	Spring Recess Ends
March 29, 2024	Friday	Good Friday - No Classes
April 1, 2024	Monday	Last Day to Withdraw
April 30, 2024	Tuesday	Friday Classes Meet
April 30, 2024	Tuesday	Last Day of Classes
May 1, 2024	Wednesday	Reading Day 1
May 2, 2024	Thursday	Reading Day 2
May 3 - May 9, 2024	Friday to Thursday	Final Exam Period

Course Outline

Changes or modifications, if any, will be announced in class.

Week	Lecture	Chapter	Topic
Week 1 1/16(T)	1	1	Class canceled by NJIT due to weather
Week 2 1/23(T)	2	1	Class introductions; R set up; introduction to probability theory;
Week 3 1/30(T)	3	2	Continuation of probability theory; Sets; counting methods
Week 4 2/6(T)	4	4	No class
Week 5 2/13 (T)	5	4 5	Introduction to statistics: history of the field of statistics; introduction to count data and sample distributions (chapter 2)
Week 6 2/20(T)	6	5	Data distributions and common probability density functions (section 1.4)
Week 7 2/27 (T)	7	5	Covariance, correlations and introduction to hypothesis testing (section 2.3, chapter 4, chapter 6)
Week 8 3/5 (T)	8	6	**MIDTERM EXAM:** **TUESDAY, MARCH 5, 2023**
3/12			**SPRING RECESS (NO CLASSES)**
Week 9 3/19(T)	9	6 7	Continuation of hypothesis testing (chapter 7, chapter 8)
Week 10 3/26(T)	10	6 7	Continuation of hypothesis testing (chapter 9, chapter 12, 13)

(WITHDRAWAL DEADLINE MONDAY, APRIL 3, 2023)			
Week 11 4/2(T)	**11**	**6** **8**	Continuation of hypothesis testing (chapter 9, chapter 12, 13) And other materials
Week 12 4/9(T)	**12**	**7** **9**	Univariate linear regression: fundamentals of regression (chapter 10)
Week 13 4/16(T)	**13**	**12**	Univariate linear regression: fundamentals of regression with continuous outcomes (chapter 10)
Week 14 4/23(T)			Logistic regression: fundamentals of regression with discrete outcomes (chapter 14)
4/30(T)			
5/3 - 5/9			**FINAL EXAM WEEK**

Updated by ProfessorT. Falconer - 1/20/2024
Department of Mathematical Sciences Course Syllabus, Spring 2024