MATH 661: Applied Statistics
Spring 2019 Graduate 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. Control charts for statistical quality control. 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 P. Natarajan

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

Required Textbooks:

Title	*Introduction to the Practice of Statistics*
Author	D.S. Moore, G.P. McCabe and B. Craig
Edition	8th
Publisher	MacMillan Learning
ISBN #	978-1464158940 (w/ Launchpad)

University-wide Withdrawal Date: The last day to withdraw with a **W** is **Monday, April 8, 2019**. It will be strictly enforced.

REFERENCE TEXTBOOKS

- *Introductory Applied Biostatistics* by Ralph D'Agostino, Lisa Sullivan, and Alexa Beiser
- *Applied Statistics and Probability for Engineers*, Sixth edition, Montgomery and Runger
- *An Introduction to Statistical Methods and Data Analysis*, 7th Edition, Ott, R. L. and Longnecker, M.
- *Fundamentals of Biostatistics*, 8th Edition, Bernard Rosner

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 :

- Demonstrate understanding of various statistical methods for summarizing and displaying data
- Demonstrate knowledge of basic probability and inference
- Demonstrate conceptual understanding of sampling distributions and the central limit theorem
- Perform statistical analysis such as estimation, hypothesis testing, regression, and analysis of variance.

Course Assessment: The assessment tools used will include regular homework assignments and quizzes, a 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:

Homework and Quizzes	25%
Midterm Exam	35%
Final Exam	40%

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. This policy will be strictly enforced.

Homework and Quiz Policy: Weekly online homework will be assigned on Launchpad. Additional homework and/or quizzes will be given in class/Moodle.

Software: Minitab/JMP/Crunchit/Excel will be used in the course for assignments/demonstration in class lectures. Smartphones and/or laptop would be needed for in-class assessments.

Exams: There will be a midterm exam during the semester and one comprehensive final exam during the final exam week. Use of Non-programmable/Non-graphing calculator is permitted during the exam. Exams will be held on the following days:

Midterm Exam	March 11, 2019
Final Exam Period	May 10 - 16, 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: To properly report your absence from a midterm or final exam, please review and follow the required steps under the DMS Examination Policy found here:

- http://math.njit.edu/students/policies_exam.php

Cellular Phones: All cellular phones and other electronic devices must be switched off during all class times.

ADDITIONAL RESOURCES

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:

- http://www5.njit.edu/studentsuccess/disability-support-services/

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

Date	Day	Event
January 22, 2019	T	First Day of Classes
February 1, 2019	F	Last Day to Add/Drop Classes
March 17 - 24, 2019	Su - Su	Spring Recess - No Classes, NJIT Open
April 8, 2019	M	Last Day to Withdraw
April 19, 2019	F	Good Friday - No Classes, NJIT Closed
May 7, 2019	T	Friday Classes Meet/ Last Day of Classes
May 8 & 9, 2019	W & R	Reading Days
May 10 - 16, 2019	F - R	Final Exam Period

Course Outline

Week	Lecture	Chapter	Topic
WEEK 1 1/28 (M)	1	1	Looking at Data-Distributions
WEEK 2 2/4 (M)	2	1	Looking at Data-Distributions
WEEK 3	3	2	Looking at Data-Relationships

2/11(M)			
WEEK 4 2/18 (M)	4	4	Probability: The study of Randomness
WEEK 5 2/25 (M)	5	4	Probability: The study of Randomness
		5	Sampling Distributions
WEEK 6 3/4 (M)	6	5	Sampling Distributions
			REVIEW FOR EXAM
WEEK 7 3/11 (M)			**MIDTERM EXAM:** **MONDAY, MARCH 11, 2019**
	7	5	Sampling Distributions
3/17(S) TO 3/24 (S) - SPRING RECESS (NO CLASSES)			
WEEK 8 3/25 (M)	8	6	Introduction to Inference
WEEK 9 4/1 (M)	9	6	Introduction to Inference
		7	Inference for distributions
WEEK 10 4/8 (M)	10	6	Introduction to Inference
		7	Inference for distributions
(WITHDRAWAL DEADLINE: MONDAY, APRIL 8, 2019)			
WEEK 11 4/15 (M)	11	6	Introduction to Inference
		8	Inference for Proportions
WEEK 12 4/22 (M)	12	7	Inference for distributions
		9	Analysis of Two-Way Tables
WEEK 13 4/29 (M)	13	12	One-Way Analysis of Variance
WEEK 14 5/6 (M)	14	3	Producing Data
			REVIEW FOR FINAL EXAM
			READING DAY 5/8 AND 5/9 (W & R)
5/10 - 5/16			**FINAL EXAM WEEK**