MATH 664-102: Methods for Statistical Consulting
Spring 2020 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: Communicating with scientists in other disciplines. Statistical tools for consulting. Using statistical software such as JMP, SAS, and S-plus. Case studies which illustrate using statistical methodology and tools are presented by the instructor and guest speakers from academia and industry. Assignments based on case studies with use of statistical software is required.

Number of Credits: 3

Prerequisites: Math 661, Regression analysis (such as Math 644), or departmental approval.

Course-Section and Instructors

Course-Section	Instructor
Math 664-102	Professor J. M. Loh

Office Hours for All Math Instructors: Spring 2020 Office Hours and Emails

Required Textbooks:

Title	*Applied Statistics - Principles and Examples (Chapman & Hall/CRC Texts in Statistical Science)*
Author	Cox and Snell
Edition	---
Publisher	Chapman and Hall/CRC
ISBN #	978-0412165702

ExtraInfo

University-wide Withdrawal Date: The last day to withdraw with a **W** is **Monday, April 6, 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	20%
Midterm Exam	25%
Final Exam	25%
Group Presentation/ Report	25%
Class Attendance/ Participation	5%

Your final letter grade will be based on the following tentative curve. Note: the grading scale is tentative and serves only as a guide. The actual grades will be based on curved scores.

A	90 - 100	C+	55 - 64
B+	75 - 89	C	40 - 54
B	65 - 74	F	0 - 39

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 Policy: No late homework will be accepted.

Discussing homework with classmates and the instructor is encouraged. However, all homework are to be written and completed individually. There should be NO sharing of code. Please refer to the university honor code (http://integrity.njit.edu/) if there are any ambiguities.

Exams: There will be one midterm exam held in class during the semester:

Midterm Exam	March 26, 2020
Final Exam Period	May 8 - 14, 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: 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 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: Spring 2020 Academic Calendar, Registrar)

Date	Day	Event
January 21, 2020	T	First Day of Classes
January 31, 2020	F	Last Day to Add/Drop Classes
March 15 - 22, 2020	Su-Su	Spring Recess: No Classes/ University Open
April 6, 2020	M	Last Day to Withdraw
April 10, 2020	F	Good Friday - University Closed
May 5, 2020	T	Friday Classes Meet - Last Day of Classes
May 6 & 7, 2020	W & R	Reading Days
May 8 - 14, 2020	F - R	Final Exam Period

Course Outline

Lecture	Date	Topic
1	1/23/2020	Overview of Statistical Consulting; Introduction to R
2	1/30/2020	Regression review; Phases of an analysis; Data structures in R
3	2/6/2020	Variation and inference; Data frames in R
4	2/13/2020	Exploratory data analysis; data cleaning and visualization
5	2/20/2020	Experimental design and sampling; sample size calculations
6	2/27/2020	Measurement error models; fixed and random effects; model choice
7	3/5/2020	Prospective and retrospective analyses; case-control studies
8	3/12/2020	Statistical models; logistic and ordinal regression
9	3/26/2020	**MIDTERM EXAM**
10	4/2/2020	Multiple testing; variable selection; dimension reduction
11	4/9/2020	Decision trees; Clustering analysis
12	4/16/2020	Longitudinal data analysis and Generalized Estimating Equations
13	4/23/2020	Working with spatial data/big data
14	4/30/2020	Student presentations
15	5/7/2020	**READING DAY**

Updated by Professor J. M. Loh - 1/21/2020
Department of Mathematical Sciences Course Syllabus, Spring 2020