

## **MATH 664: Methods for Statistical Consulting** *Spring 2022 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.

Please be sure you read and fully understand our [DMS Online Exam Policy](#).

### **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](#) or departmental approval.

**Course-Section and Instructors:**

<b>Course-Section</b>	<b>Instructor</b>
Math 664-102	Professor J. M. Loh

**Office Hours for All Math Instructors:** [Spring 2022 Office Hours and Emails](#)

**Recommended Textbooks:**

	<b>Book 1</b>	<b>Book 2</b>
<b>Title</b>	<i>Applied Statistics - Principles and Examples</i>	<i>Statistics and Scientific Method</i>
<b>Author</b>	D.R. Cox, E. J. Snell	Diggle and Chetwynd
<b>Edition</b>	1st	1st
<b>Publisher</b>	Chapman and Hall/CRC	Chapman and Hall/CRC
<b>ISBN #</b>	9780412165702	9780199543199

**University-wide Withdrawal Date:** The last day to withdraw with a W is **Monday, April 4, 2022**. 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:

<b>Homework</b>	20%
<b>Group Presentation/Report</b>	25%
<b>Class Attendance/Participation</b>	5%
<b>Midterm Exam</b>	25%
<b>Final Exam</b>	25%

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

<b>A</b>	90 - 100	<b>C+</b>	55 - 64
<b>B+</b>	75 - 89	<b>C</b>	40 - 54
<b>B</b>	65 - 74	<b>F</b>	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**.

**Homework:** 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 three exams during the semester and a cumulative final exam during the final exam week:

Midterm Exam	March 24, 2022
Final Exam Period	May 6 - May 12, 2022

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.

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

## 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 contact Scott Janz, Associate Director of Disability Support Services at [973-596-5417](tel:973-596-5417) or via email at [scott.p.janz@njit.edu](mailto:scott.p.janz@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/studentssuccess/accessibility/>

**Important Dates** (See: [Spring 2022 Academic Calendar, Registrar](#))

Date	Day	Event
January 18, 2022	Tuesday	First Day of Classes
January 22, 2022	Saturday	Saturday Classes Begin
January 24, 2022	Monday	Last Day to Add/Drop Classes
March 14, 2022	Monday	Spring Recess Begins
March 19, 2022	Saturday	Spring Recess Ends
April 4, 2022	Monday	Last Day to Withdraw
April 15, 2022	Friday	Good Friday - No Classes
April 17, 2022	Sunday	Easter Sunday - No Classes
May 3, 2022	Tuesday	Friday Classes Meet
May 3, 2022	Tuesday	Last Day of Classes
May 4 - May 5, 2022	Wednesday and Thursday	Reading Days
May 6 - May 12, 2022	Friday to Thursday	Final Exam Period

## Course Outline

Lecture	Date	Topic
1	1/20/2022	Overview of Statistical Consulting; Introduction to R
2	1/27/2022	Regression review; Phases of an analysis; Data structures in R
3	2/3/2022	Variation and inference; Data frames in R
4	2/10/2022	Exploratory data analysis; data cleaning and visualization
5	2/17/2022	Experimental design and sampling; sample size calculations
6	2/24/2022	Measurement error models; fixed and random effects; model choice
7	3/3/2022	Prospective and retrospective analyses; case-control studies
8	3/10/2022	Statistical models; logistic and ordinal regression
9	3/24/2022	<b>Midterm Exam</b>
10	3/31/2022	Multiple testing; variable selection; dimension reduction
11	4/7/2022	Decision trees; Clustering analysis
12	4/14/2022	Longitudinal data analysis and Generalized Estimating Equations
13	4/21/2022	Working with spatial data/big data
14	4/28/2022	Student presentations
15	5/7/2022	Reading day (no class)

*Updated by Professor J. M. Loh - 1/13/2022  
Department of Mathematical Sciences Course Syllabus, Spring 2022*