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Fall 2019

# MATH 661-103: Applied Statistics

J. M. Loh

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## **MATH 661: Applied Statistics** *Fall 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 661-101	Professor J.M. Loh

**Office Hours for All Math Instructors:** [Fall 2019 Office Hours and Emails](#)

**Required Textbooks:**

<b>Title</b>	<i>Introduction to the Practice of Statistics</i>
<b>Author</b>	D.S. Moore, G.P. McCabe and B. Craig
<b>Edition</b>	9th
<b>Publisher</b>	MacMillan Learning
<b>ISBN #</b>	978-1319013622 978-1319055967 (e-book)

**University-wide Withdrawal Date:** The last day to withdraw with a **W** is **Monday, November 11, 2019**. It will be strictly enforced.

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## 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

## 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 final exam.

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## 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	20%
Midterm Exam	35%
Final Exam	40%
Class Attendance/Participation	5%

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

A	90 - 100	C+	60 - 69
B+	80 - 89	C	50 - 59
B	70 - 79	F	0 - 49

**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:

No late homework will be accepted. Extensions may be granted at the instructor's discretion if sought **BEFOREHAND**.

Discussing homework with classmates and the instructor is encouraged. However, all homework are to be written and completed individually. Please refer to the university honor code (<http://integrity.njit.edu/>) if there are any ambiguities.

**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	October 16, 2019
Final Exam Period	December 15 - 21, 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](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](tel:973-596-5417) or via email at [lyles@njit.edu](mailto: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:

- <https://www.njit.edu/studentssuccess/accessibility/>

**Important Dates** (See: [Fall 2019 Academic Calendar](#), [Registrar](#))

Date	Day	Event
September 3, 2019	T	First Day of Classes
September 13, 2019	F	Last Day to Add/Drop Classes
November 11, 2019	M	Last Day to Withdraw
November 26, 2019	T	Thursday Classes Meet
November 27, 2019	W	Friday Classes Meet
November 28-29, 2019	R-F	Thanksgiving Recess
December 11, 2019	W	Last Day of Classes
December 12, 13 2019	R & F	Reading Days
December 14-20, 2019	F - R	Final Exam Period

## Course Outline

Lecture	Topic	Chapter
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1	Distributions, descriptive statistics	1
2	Looking at data - relationships	2
3	Producing data	3
4	Probability: the study of randomness	4
5	Sampling distributions	5
6	Introduction to inference	6
7	Inference for distributions	7
8	<b>MIDTERM EXAM</b>	
9	Inference for proportions	8
10	Analysis of 2-way tables	9
11	Inference for regression	10
12	One-way analysis of variance (ANOVA)	12
13	TBD	
14	Review	

*Updated by Professor J.M. Loh- 8/21/2019  
Department of Mathematical Sciences Course Syllabus, Fall 2019*

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