NJIT New Jersey's Science & Technology University

THE COLLEGE OF SCIENCE AND LIBERAL ARTS

THE DEPARTMENT OF MATHEMATICAL SCIENCES

# MATH 661: Applied Statistics
## *Summer 2020 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.

**Number of Credits**: 3

**Prerequisites**: MATH 112 with a grade of C or better.

**Course-Section and Instructors**

| Course-Section | Instructor |
|---|---|
| Math 661-850 | Professor A. Pole |
| Math 661-J32 | Professor A. Pole |

**Office Hours for All Math Instructors**: Summer 2020 Office Hours and Emails

**Required Textbook**:

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

**Withdrawal Date**: Please see the Summer 2020 Academic Calendar for the last day to withdraw based on the summer session you are registered for.

# COURSE GOALS

**Course Objectives**

- This course will acquaint students with statistical techniques, with emphasis on applications: Turning data into information.

**Course Outcomes**

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

- Demonstrate understanding and application of statistical methods for displaying, summarizing and describing data
- Demonstrate knowledge and use of basic probability and inference
- Demonstrate conceptual understanding and practical application of sampling distributions and the central limit theorem
- Perform statistical analysis including estimation, hypothesis testing, and analysis of variance.

**Course Assement**

- Assessment of objectives is achieved through homework assignments and two examinations: a midterm exam and a comprehensive 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:

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|---|---|
| **Homework Assignments** | 40% |
| **Midterm Exam** | 30% |
| **Final Exam** | 30% |

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. Absences from class will inhibit your ability to fully participate in class discussions and problem solving sessions. Tardiness to class is very disruptive to the instructor and students and will not be tolerated. Students might be withdrawn from the class or receive an "F" because of absences.

**Exams**: There will be one midterm exam held during the semester and one comprehensivebfinal exam. Exams are held on the following days:

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|---|---|
| Midterm Exam | Week 6 |
| Final Exam | Week 12 |

**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

**Math Tutoring Center**: Located in the Central King Building, Room G11, See: (Summer 2020 Hours)

**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. 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: Summer 2020 Academic Calendar, Registrar)

| Date | Event |
|---|---|
| May 18, 2020 | First Day of Classes |
| May 18, 2020 | Last Day to Add/Drop Classes for **FIRST, MIDDLE, AND FULL** |
| May 25, 2020 | University Closed for Memorial Day |
| June 22, 2020 | Last Day of **FIRST SUMMER SESSION** |
| June 29, 2020 | First Day of **FTF AND SECOND SUMMER SESSION** |
| July 4, 2020 | University Closed for Independence Day |
| July 13, 2020 | Last Day of **MIDDLE SUMMER SESSION** |
| August 3, 2020 | Last Day of **FULL AND SECOND SUMMER SESSIONS** |
| August 12, 2020 | Last Day of **FTF SUMMER SESSIONS** |

# Course Outline

| Week | Chapters |
|---|---|
| Week 1 | Chapter 1. Looking at Data Distributions |
| Week 2 | Chapter 2. Looking at Data Relationships |
| Week 3 and 4 | Chpater 4. Probability: The Study of Randomness |
| Week 4 and 5 | Chapter 5. Sampling Distributions |
| Week 6 | **MIDTERM EXAM** |
| Week 7 and 8 | Chpater 6. Introduction to Inference |
| Week 8 and 9 | Chapter 7. Inference for Means |
| Week 10 | Chpater 8. Inference for Proportions |
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|---|---|
| Week 11 | Chapter 9. Analysis fo Two-Way Tables/Chapter 12. One Way Analysis of Variance |
| Week 12 | **FINAL EXAM** |

*Updated by Professor A. Pole - 4/9/2020*
*Department of Mathematical Sciences Course Syllabus, Summer 2020*