

**BOROUGH OF MANHATTAN COMMUNITY COLLEGE THE
CITY UNIVERSITY OF NEW YORK**

Department of Mathematics

**INTRODUCTION TO STATISTICS
WITH ALGEBRA
MAT 150.5**

Class hours: 4

Recitation: 2

Credits: 4

Telephone:

Email:

**Instructor:
Office:**

Course Description

Statistics with algebra is a statistics course (4 credits and 60 hours) with an additional 30 hours focusing on elementary algebraic concepts useful in statistics. After covering the selected algebraic concepts, the course covers the study of basic statistics. It includes measures of central tendency, measures of dispersion, graphs, probability, the binomial distribution, the normal distribution, sampling distributions, the chi-square distribution, t -tests, estimation and hypothesis testing, correlation and regression.

Prerequisites

This course is recommended for non-STEM majors. **It does not satisfy the prerequisites for MAT 056.**

To qualify students must be exempt from MAT 008 or pass MAT 008.

MAT 150.5 is equivalent to MAT 150. (Students who passed MAT 150 cannot register for MAT 150.5. Students who passed MAT 150.5 cannot register for MAT 150).

Evaluation and Requirements of Students

At the beginning of the semester, the instructor will advise the student on how the final grade will be determined (based on class work, examinations, quizzes, writing assignments and the final examination).

Each summative assessment will have two parts: algebra and statistics. **In order to satisfy the algebra requirement, students must earn a 70% or higher throughout the semester on the designated questions.** Students will receive a second try on algebra if needed during finals week. Given below is the grade distribution.

Class Participation	10%
Homework	20%
Tests	25%
Midterm	20%
Final Exam	25%

Student Learning Outcomes:

<p align="center">Course Student Learning Outcomes</p>	<p align="center">Measurements</p>
<p>1. Students will study basic concepts of descriptive statistics, including graphical representations of data and measures of central tendency, position and dispersion.</p> <p>Students will:</p> <ul style="list-style-type: none"> Know the difference between a population and a sample. Classify data by type. Design a sampling plan for a statistical study. Construct frequency distributions from data sets. Construct histograms, polygons and ogives from frequency distributions. Construct pie and Pareto charts. Interpret basic charts and graphs Define the vocabulary, terminology and symbols used in statistics. Calculate and <i>interpret</i> key statistics and parameters such as <ul style="list-style-type: none"> <input type="checkbox"/> the mean, the mode, the median, <input type="checkbox"/> the standard deviation <input type="checkbox"/> quartiles and percentiles <input type="checkbox"/> standard (z) scores 	<p>1. Quizzes, tests, homework and/or projects</p>
<p>2. Students will study basic concepts of probability leading to the study of the binomial and normal probability distributions and the Central Limit Theorem.</p> <p>Students will:</p> <ul style="list-style-type: none"> Identify the sample space of a probability experiment. Find classical and experimental probabilities, and explain how the two are related using the Law of Large Numbers. Use the Multiplication and Addition Rules for finding probabilities. Find permutations and combinations. Construct and graph discrete probability distributions. Find the mean and standard deviation for discrete probability distributions and for binomial probabilities. Find binomial probabilities using the formula and a table and/or technology. Understand the properties of the normal distribution. Use the standard normal table and/or technology to find probabilities. Use the standard normal table and/or technology to find data values. Understand and use the Central Limit Theorem. 	<p>2. Quizzes, tests, homework and/or projects</p>

<p>3. Students will be able to construct simple statistical studies and hypothesis tests using Normal distributions as well as with other distributions such as the t and the chi-squared distribution.</p> <p>Students will:</p> <ul style="list-style-type: none"> Construct confidence intervals for means (large samples). Construct confidence intervals for means (small samples). Construct confidence intervals for population proportions. Perform hypothesis tests for means (large samples). Perform hypothesis tests for means (small samples). Interpret the results of hypothesis tests and confidence intervals. Find the linear correlation coefficient, using software if possible Test the linear correlation coefficient for significance. Find the equation of a regression line, using software if possible Predict y values using regression equations. Interpret a positive, negative or close to zero correlation Perform Chi Square Goodness-of-Fit tests 	<p>3. Quizzes, tests, homework and/or projects</p>
--	--

General Education Learning Outcomes

	General Education Learning Outcomes	Measurements
<input type="checkbox"/>	Communication Skills- Students will be able to write, read, listen and speak critically and effectively.	
✓	Quantitative Reasoning- Students will be able to use quantitative skills and the concepts and methods of mathematics to solve problems.	Quizzes, tests, homework and/or projects
<input type="checkbox"/>	Scientific Reasoning- Students will be able to apply the concepts and methods of the natural sciences.	
<input type="checkbox"/>	Social and Behavioral Sciences- Students will be able to apply the concepts and methods of the social sciences.	
<input type="checkbox"/>	Arts & Humanities- Students will be able to develop knowledge and understanding of the arts and literature through critiques of works of art, music, theatre or literature.	

<input type="checkbox"/>	Information & Technology Literacy- Students will be able to collect, evaluate and interpret information and effectively use information technologies.	
<input type="checkbox"/>	Values- Students will be able to make informed choices based on an understanding of personal values, human diversity, multicultural awareness and social responsibility.	

Required Text and Supplementary Material

Elementary Statistics: Picturing the World, Seventh Edition, By Ron Larson and Betsy Farber, 2018, Pearson Education, Inc. THIS MUST BE PURCHASED IN THE BMCC STUDENT BOOKSTORE WITH THE MYSTATLAB BUNDLE!!

My course id (given by instructor): _

Other Resources

The resources available in the Math Lab (Room S535) include tutors, videotaped lessons, technology (statistics computer programs, graphing calculators and internet access) and additional worksheets.

Use of Technology

A scientific calculator is required. The new textbook comes with a free internet account that provides online tutorials, extra practice problems and video recorded lessons. Some MAT 150 sections listed in the Schedule of Classes as taught with technology require students to use computers and/or graphing calculators.

College Attendance Policy

At BMCC, the maximum number of absences is limited to one more hour than the number of hours a class meets in one week. For example, you may be enrolled in a three-hour class. In that class, you would be allowed 4 hours of absence (not 4 days). In the case of excessive absences, the instructor has the option to lower the grade or assign an F or WU grade.

Academic Adjustments/Students with Disabilities

Students with disabilities who require reasonable accommodations or academic adjustments for this course must contact the Office of Services for Students with Disabilities (Room N324;220-8180). BMCC is committed to providing equal access to all programs and curricula to all students.

BMCC Policy on Plagiarism and Academic Integrity Statement

Plagiarism is the presentation of someone else’s ideas, words or artistic, scientific, or technical work as one’s own creation. Using the idea or work of another is permissible only when the original author is identified. Paraphrasing and summarizing, as well as direct quotations, require citations to the original source. Plagiarism may be intentional or unintentional. Lack of dishonest intent does not necessarily absolve a student of responsibility for plagiarism. Students who are unsure how and when to provide documentation are advised to consult with their instructors. The library has guides designed to help students to appropriately identify a cited work. The full policy can be found on BMCC’s Web site, www.bmcc.cuny.edu. For further information on integrity and behavior, please consult the college bulletin (also available online).

Outline of Topics

<i>Class hours</i>	<i>Sections in Larson</i>	<i>Topics</i>
6 hours	1.1 – 1.3	Introduction to Statistics, Types of Data, Data Collection <i>Algebra Topics: Exponents & Scientific Notation</i>
12 hours	2.1 – 2.5	Exploring Data with Tables and Graphs, Measures of Center, Measures of Variation. <i>Algebra Topics: Radicals, Radicals with Variables, and Solving Literal Equations</i>
2 hours	Review for Test 1	
2 hours	Chapter 1-2	Test 1
8 hours	9.1 – 9.2	Correlation and Regression. <i>Algebra Topics: Linear Equations and Linear Inequalities</i>
12 hours	3.1 – 3.4	Probability: Addition Rule, Multiplication Rule, Conditional Probability and Counting. <i>Algebra Topics: Percents, Decimals, Fractions, Two Way Tables, and Percent Change</i>
2 hours	Review for Midterm	
2 hours	Chapters 1-3, 9	Midterm
6 hours	4.1 – 4.2	Discrete Probability Distributions; Random Variables, Binomial Distributions.
8 hours	5.1 – 5.4	Normal Probability Distributions; Sampling distributions and the Central Limit Theorem.
8 hours	6.1 – 6.3	Confidence Intervals for Means and Proportions, Estimating Sample Sizes.
2 hours	Review for Test 2	

2 hours	Chapters 4-6	Test 2
10 hours	7.1 – 7.4	Introduction to Hypothesis Testing, Tests for a Mean, Test for a Proportion.
2 hours	10.1 – 10.2	Chi-squared tests of Independence and Goodness of Fit.
2 hours	Review for Final	
2 hours	Final Examination	