**Guttman Community College**

**MATH 103: Statistics**

**CID Effective Date: Fall 2012**

*About this document: A Course Information Document (CID) is a compendium of approved information about a given Guttman course that serves as an instructor-facing reference sheet. It does not substitute for a student-facing syllabus and it only changes when a course revision is approved through official governance processes (Curriculum Committee, College Council, and University Chancellor’s Office.)*

**Course Creation:** Fall 2012 **Last Modification:** Spring 2021

**Items below this line require governance approval to be changed.**

**Course Subject:** MATH

**Course Number:** 103

**Course Title:** Statistics

**Credits/Hours:** 3/5

**Writing-Intensive (Y/N)**: No

**CUNY Common Core Category:** N/A

**Requirement Designation:**  RMQC

**Experiential Learning**: N/A

**Zero Cost/OER:** N/A

**Course Description:**

This course will provide students with an in-depth understanding of the fundamental concepts and computational methods of statistics. These concepts will be developed through the question of how to estimate an unknown quantity using sample data. Students will learn to incorporate the foundational concepts of mathematics with statistical analysis to describe and solve real-life problems and questions. Students will be taught to use estimation and precision and will learn the math study skills to assess and enhance their learning, their processes and their results. Students will use statistical software, graphing calculators, Microsoft Excel, MyMathLab and MyStatsLab to carry out a semester-long project involving data description and analysis. Students will work collaboratively and write using appropriate mathematical and non-mathematical language in order to successfully complete their project. The topics addressed include: displaying categorical data using tables, bar graphs, and circle graphs; drawing conclusions about categorical data; displaying quantitative data using dot plots, stem-and-leaf plots, histograms and box-and-whisker plots; describing data distributions using measures of center (mode, mean, and median) and measures of spread (standard deviation, range and IQR); Displaying bivariate data using scatterplots; analyzing bivariate data using linear regression; elementary probability; normal probability distributions, sampling distributions; confidence intervals and hypothesis testing of the proportion and the mean.

**Course Learning Outcomes:**

Upon successful completion of this course, you will be able to do the following:

1. Identify and apply the concepts of numeracy to solve statistical and mathematical problems both with and without technological assistance.
2. Represent and know how to read, collect and organize data in written and graphical forms as well as interpret the data and make appropriate inferences from their readings.
3. Demonstrate an understanding of proportional relationships and how statistical inference is based in probability.
4. Design a project involving sample data from a variety of fields and appropriate statistical data analysis including formulating a question, selecting data and recognizing which statistical model is most appropriate for different data types and to answer different questions.
5. Recognize and understand functions as a way of modeling correspondence between two variables and employ appropriate statistical language, correct Standard English, and illustrative graphical depictions to communicate the relationship.
6. Construct, compute and accurately interpret confidence intervals and hypothesis tests and determine if the data supports a hypothesis to a given level of significance.
7. Demonstrate the ability to work collaboratively and independently on assignments in and outside a classroom setting.
8. Estimate mathematical quantities and evaluate the accuracy of their answers and adjusting their work when necessary.

**MQR Pathways Course Learning Outcomes:**

Upon successful completion of this course, you will be able to do the following:

1. Interpret and draw appropriate inferences from quantitative representations, such as formulas, graphs, or tables.
2. Use algebraic, numerical, graphical, or statistical methods to draw accurate conclusions and solve mathematical problems.
3. Represent quantitative problems expressed in natural language in a suitable mathematical format.
4. Effectively communicate quantitative analysis or solutions to mathematical problems in written or oral form.
5. Evaluate solutions to problems for reasonableness using a variety of means, including informed estimation.
6. Apply mathematical methods to problems in other fields of study.

**Prerequisites:** Demonstration of Elementary Algebra Proficiency

**Co-Requisites:** None

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| **Program of Study** | **Required** | **Elective** | **Not Applicable** |
| A.A. Business Administration |  |  | X |
| A.A. Human Services |  |  | X |
| A.A.S. Information Technology |  |  | X |
| A.A. Liberal Arts – Social Science and Humanities Track |  |  | X |
| A.A. Liberal Arts – Science and Mathematics Track |  |  | X |
| A.A. Urban Studies |  |  | X |

**Items below this line are recommendations. Please consult Program, Area, or Course Coordinator.**

**Topical Outline**:

* Statistical Studies and Overview of Data Analysis and Collection
* Summarizing Data Graphically and Numerically
* Measures of Centrality and Variability
* Modeling Bivariate Data
* Probability
* Assessment and Projects
* Normal Distribution
* Sampling Distributions of the Sample Mean and Sample Proportion
* Confidence Intervals
* Hypothesis Tests for Means and Proportions
* Hypothesis Tests for Differences Between Means and Proportions
* Presentations and Assessment

**Required Texts/Readings:**

Sullivan III, Michael. 2011. Fundamentals of Statistics [NCC Customized Edition]. Boston: Prentice Hall. Price: $80-$120. ISBN-13: 9780321641878

**Required Materials:**

MS Excel™, TI-85™ calculator, Digication™, Blackboard™, Web access; MyMathLab™; MyStatsLab™

**Signature Assignment:**

Note: Individual sections of a course may vary. Please consult CUNYfirst and the course syllabus for section-specific requirements and details.