Department Master Syllabus

# Camden County College

**Blackwood, New Jersey**

**Course Title**: **Statistics I**

**Course Number**: **MTH-171**

**Department/Program Affiliation: Mathematics**

**Date of Review: 11/2018**

(This Department Master Syllabus has been examined by the program/department faculty members and it is decided that no revision is necessary at this time.)

**Date of Last Revision**: **11/2018**

(This Department Master Syllabus has been examined by the program/department faculty members and it is decided a change requiring a revision is necessary at this time.)

**N.B.** A change to the course materials alone (textbooks and/or supplementary materials) may not constitute a revision. Any other change to the items listed below on this form is considered a revision and requires approval by the program faculty at a Program/Department Meeting and by the division at a Chairs and Coordinator Meeting.

**Credits:** 3

**Contact Hours**: **Lecture** 3 **Lab** 0 **Other**

**Prerequisites:** MTH-114 (College Algebra for Business and Social Science) **OR** MTH-123 **(**Precaclulus Mathematics I) **OR** MTH-125 (Accelerated Precalculus) **AND** ENG-013 (Reading Skills III) **OR** proper placement exam scores.

**Corequisites**: None

**Course Description:**

This course is designed for business, social science, and other majors requiring knowledge of the basic principles and methods of statistics and elementary research techniques. Topics include measures of central tendency and dispersion; probability theory; descriptive methods in linear regression and correlation; random variables and probability distributions; binomial, normal, and t-distributions; sampling distributions and the central limit theorem; confidence intervals; 1-sample and 2-sample hypothesis testing for means and proportions. Students will learn to use a statistical software package through assigned projects.

**Course Student Learning Outcomes:** (Cognitive, Psychomotor, Affective Domains)

Upon completion of this course students will be able to:

* Explain the basic definitions and concepts used in statistics, as assessed by tests, quizzes, homework, or projects.
* Develop frequency distributions, and generate statistical graphics, as assessed by tests, quizzes, homework, or projects.
* Find and interpret measures of central tendency, dispersion, and relative position for grouped and ungrouped data, as assessed by tests, quizzes, homework, or projects.
* Demonstrate comprehension of linear regression and correlation and interpret slope, as assessed by tests, quizzes, homework, or projects.
* Calculate and interpret probabilities, as assessed by tests, quizzes, homework, or projects.
* Exhibit comprehension of probability and sampling distributions, as assessed by tests, quizzes, homework, or projects.
* Make estimates of population parameters and demonstrate an understanding of the principles underlying estimation and hypothesis testing, as assessed by tests, quizzes, homework, or projects.

**General Education Student Learning Outcomes:**

## Students will apply appropriate mathematical and statistical concepts and operations to interpret data and to solve problems.

## Course Outline:

### **Unit I**

### Statistics Basics--Terminology

Descriptive vs. Inferential Statistics

### Types of Variables

### Levels of Measurement

### Grouped Data/Frequency Distributions

### Graphs and Charts—dotplots, stemplots, histograms, line charts

**Unit II**

. Measures of Center—mean, median, mode, modal class; mean versus median

Weighted Mean

Distribution Shapes

Measures of Relative Standing

Measures of Dispersion—MAD, range, interquartile range, standard deviation

i) when to use IQR and median versus mean and standard deviation.

The Five-Number Summary; boxplots, side-by-side boxplots

Descriptive Measures for Populations; Use of Samples

**Unit III**

Data Collection

Sampling Methods

Research Basics

Probability Basics

Types of Events

Rules of Probability

Counting Techniques (Permutations and Combinations)

Contingency Tables

Conditional Probability

**Unit IV**

Discrete Random Variables and Probability Distributions

The Mean and Standard Deviation of a Discrete Random Variable

The Binomial Distribution

Continuous Random Variables and Introducing Normally Distributed Variables

Areas Under the Standard Normal Curve

Working With Normally Distributed Variables & the Empirical Rule

Assessing Normality; Normal Probability Plots

Normal Approximation to the Binomial Distribution

**Unit V**

### Sampling Distributions of the Sample Mean and Sample Proportion

The Central Limit Theorem

### Confidence Intervals for One Population Mean When Is Known

Confidence Intervals for One Population Mean When  Is Unknown

Confidence Intervals for One Population Proportion

### Hypothesis Testing--Terms, Errors, Hypotheses, Power

Hypothesis Tests Involving a Sample Mean When  Is Known

Hypothesis Tests Involving a Sample Mean When  Is Unknown

Hypothesis Tests for One Population Proportion

**Unit VI**

Hypothesis Tests Involving Two Sample Means

Linear Equations With One Independent Variable & Scatterplots

The Regression Equation

The Correlation Coefficient

**Course Activities:**

The classroom activities will include formal and informal lectures where new material and assigned problems will be explained. Students will have the opportunity to contribute to the discussion and to ask questions about the material. Statistical software is integrated via projects completed outside of class.

**Assessment of Student Learning Outcomes**: The student will be evaluated on the degree to which student learning outcomes are achieved. In addition to a minimum of two tests, a variety of methods may be used such as class participation, projects, homework assignments, etc. (there must be some evidence that the learning outcomes have been achieved.) Student progress will be evaluated on the following basis:

1. Unit Tests

2. Periodic Quizzes, if you deem they are necessary to motivate students to study and attend class on a regular basis

3. Electronic Homework assignments, if graded.

4. Software projects

5. Class attendance, if you have specified this at the beginning of the semester.

6. Comprehensive final examination

**Grading:**

Grades will be based on the student’s performance in the above designated areas. Percentages will be assigned by each individual professor.

A 90 to 100

B 80 to 89

C 70 to 79

D 60 to 69

F Below 60

I Incomplete (only under extreme emergencies)

Must be completed within one semester.

NA Not Attending

XA Never Attended

W Withdraw (student must submit an official withdrawal form by the deadline)

**Course Materials:**

Textbook: *Introduction to Business Statistics*, Weiers, Cengage, current ed.

Student Solution Manual

**Supplemental Materials:**

Textbook specific course management system.