LAGUARDIA COMMUNITY COLLEGE
CITY UNIVERSITY OF NEW YORK
DEPARTMENT OF MATHEMATICS, ENGINEERING, AND COMPUTER SCIENCE

MAT 119 –STATISTICS AND ELEMENTARY ALGEBRA
5 Lecture Hours, 2 Lab Hours, 3 Credits
Pre-Requisite: MAT 095 or placement into MAT 096

Instructor Name: _____
Office Hours: _____
Tutoring Hours: _____

CATALOG DESCRIPTION

This is a statistics course with algebra support using the Statway curriculum. The focus is on statistics (data collection, numerical and graphical representation of data, linear correlation and regression, discrete and continuous probability distributions, estimation, and hypothesis testing); relevant algebra topics such as fractions, percent, linear equations in one and two variables and functional relationships are integrated, resulting in a collaborative, problem-based class.

PURPOSES AND GOALS

This course covers the curriculum of a 3-credit elementary statistics course with sufficient developmental mathematics to insure success. Two lab hours and two additional classroom hours are required for this. The purpose of this course is to reduce into one semester the sequence of courses leading to a credit-bearing Math course. In addition, the students will be exposed to productive persistence to deepen learning and understanding the topics of the course. This learning opportunity is present in each lesson of the semester, where students work in groups and experience this teaching model.

INSTRUCTION OBJECTIVES

1. Enable students to create social ties with peers and instructors using the "Productive Persistence" and "Starting Strong" packages, sets of evidence-based activities developed and tested to increase student success and retention.
2. Introduce students to the fundamental questions that arise in a statistical study.
3. Familiarize students with the design of statistical studies, introducing them to the issues of population identification, sample selection and bias.
4. Provide students with qualitative and quantitative descriptions of data distributions in graphical and numerical formats.
5. Provide students with the skills needed to construct graphs from linear and nonlinear equations and, conversely, determine equations from graphs of straight lines.
6. Introduce students to bivariate data to identify correlations, causations and regressions; in order to make predictions.
7. Introduce students to the basic concepts of probability, the law of large numbers, probability rules, and two-way tables.
8. Familiarize students with the binomial, normal, and Student t-distributions, and the Central Limit Theorem.
9. Provide students with the method of estimating a population mean, and enable them to conduct hypothesis testing.

PERFORMANCE OBJECTIVES

1. Demonstrate the ability to work effectively in groups, discussions, and class activities.
2. Compare and contrast observational and experimental statistical studies and describe the conclusions that can be drawn from each.
3. Conduct statistical studies, calculate descriptive statistics, and identify hypotheses.
4. Create, compute, and interpret graphical and numerical summaries of data distributions.
5. Appreciate the interplay of algebra and geometry in the graphical representation of linear and non-linear systems.
6. Compute, analyze and describe the results of linear correlation, causation and regression presented in output data from a statistical package.
7. Compute probabilities using relative frequencies, proportions and basic rules.
8. Compute probabilities and confidence intervals in order to estimate population parameters from sample data.
9. Appropriately use normal or Student t-distributions to estimate the population mean; and formulate and conduct hypothesis tests.

REQUIRED MATERIALS

Instructions to access course materials are provided in class. The course content is organized by modules, each featuring online and written materials.

Online Platform: portal.carnegiemathpathways.org where the e-text and interactive online activities are available. In this Pathways Portal, students have access to:

- All e-text readings of Module topics and interactive "Try These" exercises.
- Online homework labeled "Lesson Check" assignments.
- "End-of-Module Checkpoint" quizzes
- Online part of the midterm and final exams.

Class Workbook: "Statway: A Pathway Through College Statistics. 3.1 (2018)". This workbook contains the activities to be completed during class time and additional written "Take it Home" exercises.

Students are required to have a printed copy of the Workbook materials for each class and must have credentials for the online Pathways Portal.

Standard Scientific Calculator. A basic calculator that can add, subtract, multiply, and divide plus basic functions like exponents and square roots. Check with your instructor the types of calculators allowed in class. *Mobile phone calculators are not allowed to be used during quizzes or exams.*

GRADING POLICY AND ATTENDANCE

1. Students are expected to attend all class meetings, as in-class work is an integral part of the course.
2. Students are responsible for all materials and assignments covered in class.
3. All absences are required to be explained and documented to the instructor.
4. A failing grade is assigned to any student with 6 or more unexcused absences—approximately equivalent to 12 hours of class.
5. An absence is marked when the student misses more than half of a class session.
6. A student is considered late if she or he misses more than 20 minutes of class time.
7. Three late marks are equivalent to one absence.
8. Students should consult the college catalog to find out the terms and conditions under which WU, incomplete, or F grades may be given by an instructor.

EXPECTIONS FOR STUDENTS ENROLLED IN STATWAY:

1. The nature of the Statway program requires students to work in groups for a significant amount of the class time.
2. The learning process depends heavily on taking opportunities to work, discuss, and cooperate with others to solve problems.
3. Students should expect a significant amount of reading and writing compared to other math classes.
4. Students are expected to spend at least one hour every day outside of class for activities like course text readings, practice exercises, homework, and working with a tutor.

ACADEMIC INTEGRITY

This class will be conducted in compliance with LaGuardia Community College's academic integrity policy. For more information check: http://www.laguardia.edu/asc/Academic-Standing-FAQs/

EVALUATION

The purpose of a grading system is to give you and readers of your transcript an accurate record of your activities in this course. The role of the MEC Department is to provide a fair, valid, and reliable structure for assessing your achievement. MAT119 is an intensive course and all the work you complete in class, at home, and in the online platform counts towards your final grade.

Collaborative Assignments	In-class group and computer lab work	20%	Attendance, preparation, and participation. Statway Workbook exercises collected for review and grading. (10%) Activities assigned during computer lab hours, e.g., using Statistical software. (10%)
Home Work	Assignments and projects	10%	Statway Workbook Take-it-home exercises, Fundamentals Lessons, written homework, and at least one Data Project.
	Online Activities	10%	Online portal activities to be completed out-of-class, including: e-text reading, 'Try These', and 'Checkpoints'.
6 End-of-Module Checks		15%	Online quiz at the end of each Statway module.
Midterm Assessment		20%	Departmental Midterm Exam composed of one online (5%) and one written (10%) part. Mid-semester *Inquiry & Problem Solving* Essay (5%).
Final Assessment		25%	3-hour Departmental Exam composed of one online (5%) and one written (20%) part.
	TOTAL	**100%**	*In order to pass, you must have an average total score at least 60%.*

COURSE OUTLINE

The course content is divided into modules. In total, the course covers 6 modules. The table below, it is included to help you plan your term and be aware of the checks and exams due dates in advance.

The "Number of Hours" is an estimate of the class time needed to cover the corresponding lesson. "Lesson" and "Title" correspond to the Statway workbook and e-text readings.

The column labeled "Lesson Fundamentals" lists activities that support mathematics background skills required for you to feel comfortable during a given topic or module. These lessons are available to be printed at the online portal. Keep in mind that this class requires a lot of reading and writing. Your instructor will provide you with additional support, tools, and resources to acquire and deliberately practice the math background skills.

	Time	Lesson	Topic	Lesson	Fundamentals
Week 1	1	1.1.0	Setting Course Expectations, Creating Productive Classroom Norms	1	Quantitative Reasoning
	2	1.1.1	The Statistical Analysis Process	2	Order of Operations Addition and Subtraction
	1	1.1.2	Statway Mindset Activity and Populations and Samples	3	Order of Operations Multiplication and Division
	1	1.1.3	Research Questions and Types of Statistical Studies - Part I	4	Order of Operations Multi-Step Calculations
	2	*Lab*	*Getting Started with portal.carnegiehub.org*		
Week 2	1	1.1.3	Research Questions and Types of Statistical Studies - Part II	5	Place Value
	1	1.2.1	Random Sampling	6	Rounding
	1	2.1.1	Distributions of Quantitative Data: Dotplots	7	Large Numbers and Powers of Ten
	1	2.1.2	Distributions of Quantitative Data: Constructing Histograms	8	Multiples and Factors
	1	Review	Module 1		
	1	*Lab*	*Creating Dotplots and Histograms*		
	1	***Check***	***Module 1***		
Week 3	1	2.2.1	Quantifying the Center of a Distribution	9	Prime Factorization, GCF, and LCM
	2	2.3.1	Quantifying Variability Relative to the Median	10	Fraction Basics
	2	2.4.1	Quantifying Variability Relative to the Mean	11	Fractions Multiplying and Dividing
	1	*Lab*	*Introduction to Midterm Essay*	12	Ratio and Proportions
	1		*Center and Spread of Samples and Distributions*		
Week 4	2	5.1.0	SWC 2.1 Introduction to Probability	14	Percents Just the Basics
	1	5.1.1	An Introduction to Two-Way Tables	15	Percents Operations
	1	5.1.2	Marginal, Joint, and Conditional Probabilities	16	Estimation
	1	Review	Module 2		
	1	*Lab*	*Simulation to Estimate Probabilities*		
	1	***Check***	***Module 2***		
Week 5	2	5.1.3	Building Two-Way Tables to Calculate Probabilities	17	Conversion Percents, Decimals, and Fractions
	2	6.1.2	Probability Rules	18	Real Line
	1	Review	Module 5		
	1	*Lab*	*Survey Data and Two-Way Tables*		
	1	***Check***	***Module 5***		
Week 6	2	6.1.3	Probability Distributions of Discrete Random Variables	19	Units and Measurements
	2	6.1.5	Binomial Experiments	27	Practice with Functions
	1	6.2.1	Probability Distributions of Continuous Random Variables		
	1	*Lab*	*Introduction to Data Project*		
	1		*Discrete Distributions*		

	Time	Lesson	Topic	Lesson	Fundamentals
Week 7	2	6.2.2	*Z*-Scores and Normal Distributions	21	Geometry Perimeter, Area and Volume
	2	Review	Midterm. Modules 1, 2, 5		
	1	**Exam**	**Midterm Written Part**		
	1	*Lab*	*Using tables to obtain probabilities*		
	1	***Exam***	***Midterm Online Part***		
Week 8	2	6.2.3	The Standard Normal Distribution	20	Algebra Basics
	1	9.1.1	Sampling Distributions of Sample Means	22	Translating Word Expressions into Notation
	2	Review	Module 6		
	1	*Lab*	*Continuous Distributions*		
	1	***Check***	***Module 6***		
Week 9	2	9.1.2	Central Limit Theorem for Sample Means	23	Linear Equations (Part I)
	1	9.2.1	The *T*-Distribution and *T*-Statistics	24	Linear Equations (Part II)
	2	9.2.2	Confidence Intervals for a Population Mean		
	1	11.1.1	Statsitical Models and Mathematical Functions		
	1	*Lab*	*Central Limit Theorem Experiments*		
Week 10	1	9.3.1	Hypothesis Testing	13	Rates
	2	9.3.1	Hypothesis Tests for Population Means	25	Pattern Recognition
	1	3.0.0	Bridge 1.1. Linear Equations	26	Plotting Points
	1	11.1.2	*Linear Functions*		
	2	*Lab*	*Hypothesis Testing*		
Week 11	1	3.1.1	Introduction to Scatterplots and Bivariate Relationships		
	1	3.1.2	Form, Direction, and Strength of Bivariate Relationship		
	1	3.1.3	Introduction to the Correlation Coefficient and Its Properties		
	1	3.2.1	Using Lines to Make Predictions		
	1	Review	Module 9		
	1	*Lab*	*Linear Correlation and Scatterplots*		
	1	***Check***	***Module 9***		
Week 12	1	3.2.3	Investigating the Slope and *Y*-intercept of LS Regression Lines		
	1	3.2.4	Special Properties of the Least-Squares Regression Line		
	3	Review	Final Exam		
	1	*Lab*	*Predictions and LSR Model*		
	1	***Check***	***Module 3***		