

**HOSTOS COMMUNITY COLLEGE  
DEPARTMENT OF MATHEMATICS  
AND COMPUTER SCIENCE**

Semester: Spring 2026

Prof. Name: Reginald Dorcely

Course: MAT 120 Section: 136A [44612]

Time: MoWe, & Th 8:00 AM - 9:15 AM Online Synchronous

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Office Hours: MoWe, & Th 9:30 AM – 11:30 AM Room: B446

MAT 120:	Introduction to Probability and Statistics
CREDIT HOURS:	3.0
EQUATED HOURS:	3.0
CLASS HOURS:	4.5

PREREQUISITES: Passing score on: MAT 15, MAT 20, MA 20 OR equivalent, or placemat

PRE/REQUISITES: ESL 35

**DESCRIPTION:**

The student will identify, define, and compute the measures of central tendency and dispersion; develop frequency distributions and related histograms; determine the level of correlation; and draw inferences from regression lines. The student will also solve problems involving sample spaces, counting techniques, and mathematical expectation; determine the probability of normally distributed events through use of tables; conduct hypothesis testing; and determine confidence intervals.

All students should have the suggested CALCULATOR TI 83 OR TI84. Any scientific calculator will do; the instructor is not responsible of showing HOW TO USE IT.

**RECOMMENDED TEXTS BOOKS:**

Michael Sullivan, III Fundamentals of Statistics

Informed Decisions Using Data, 5<sup>th</sup> edition, Pearson-Addison Wesley, C2018.

Instructor's Lecture Notes: Study.Com and PowerPoint Slides.

Bluman, A. G. (2018). *Elementary statistics: A step-by-step approach* (8th ed.). Publisher.

<https://ugess3.wordpress.com/wp-content/uploads/2016/01/bluman-step-by-step-statistics-8th-edition.pdf>

Illowsky, B., & Dean, S. (2023). *Introductory Statistics* (2nd ed.) [PDF]. OpenStax.

<https://openstax.org/details/books/introductory-statistics-2e>

## STUDENT LEARNING OUTCOMES:

1. Interpret and draw appropriate inferences from quantitative representations of data in numerical, chart or tabular form. This includes summarizing data by constructing frequency distributions, histograms, stem and leaf plots, box plots, pie charts or Pareto charts.
2. Use numerical and statistical methods as well as techniques from probabilities to reason statistically, i.e., to draw accurate conclusions and correctly interpret patterns of data sets. This includes measures of center, spread or variation, combining probabilities, estimation procedures, hypothesis testing, correlation, regression and analysis of variance.
3. Represent quantitative problems expressed in natural language in a suitable statistical format and techniques.
4. Effectively communicate quantitative analysis or solutions to mathematical problems in written or oral form. This involves understanding and using the basic language and tools of statistics such as fundamental definitions with some very basic principles to attain statistical literacy.
5. Evaluate solutions to problems for reasonableness using a variety of means, including informed estimation. This includes estimation procedures, hypothesis tests and testing the fitness of linear models to represent data sets.
6. Apply statistical methods to model and analyze problems in other fields of study including economics, social sciences, education, political science, health, etc.

## PERFORMANCE OBJECTIVES:

At the end of the course, the student should be able to do the following:

- A. Categorize statistical studies as either descriptive or inferential
- B. Difference between population and samples in an inferential study, compare different sampling methods.
- C. Categorize variables as either qualitative or quantitative, and discrete or continuous.
- D. Generate and interpret frequency distributions and graphs representing data sets.
- E. Get and interpret descriptive measures of univariate data sets for both samples and populations. Also differentiate between a parameter and a statistic.
- F. Be familiar with and use the basic definitions and rules of probability theory.
- G. Study binomial, normal, and Student's t-random variables and their probability distributions.
- H. Decide the sampling distribution of the mean for either a normally distributed variable or a variable that is not normally distributed, and state and apply the central limit theorem.
- I. Apply the normal or the student's t-distribution to estimate population parameters and conduct hypothesis tests.
- J. Perform hypothesis and create confidence intervals for standard deviation of a normally distributed random variable using chi-square distribution.
- K. Apply the chi-square goodness-of-fit test to make inferences about a distribution of a qualitative variable or discrete quantitative variable.

### INSTRUCTIONAL OBJECTIVES:

The expectations of the instructor are as follows:

- A. Explain the nature of statistics
- B. Show how data sets, tables, graphical displays and descriptive measures can be used.
- C. Explain the binomial, normal and Student's t-distributions and explain how they can be applied to estimate population parameters and conduct hypothesis tests. Clarify the assumptions and limitations of the statistical techniques that are based on these distributions.
- D. Establish the basic concepts of probability and the rules that apply to the probability of both simple and compound events
- E. Establish the concepts of correlation and regression; explain the interpretation of the slope, correlation coefficient, and coefficient of determination, and the use of regression equations to make predictions.
- F. Introduce to the student the basic understanding of the hypothesis testing procedure and theory estimation.
- G. Offer a general examination of hypothesis testing, which will include the following:
  - Formulation of hypothesis
  - Purpose of decision rules for given significance levels
  - Testing Procedure (Ex: use of normal, t-distribution, chi-square distribution, F-distribution)
  - Analysis of Type I and II errors
- H. Have the student familiarize itself with one-way analysis of variance method for testing more than two population means (ANOVA)

### ATTENDANCE:

- A. Students are required to attend all class meetings
- B. Students are responsible for all class information, materials, and assignments
- C. Students should check with the college catalog to find the terms and conditions under which a WU, WN, incomplete, or F grade may be given by the instructor

### GRADES:

A, A<sup>-</sup>, B<sup>+</sup>, B, B<sup>-</sup>, C<sup>+</sup>, C, D, I, F

### GRADING:

Class participation/Quizzes / Assignments	30%
At least two partial Test	20%
Project(s)	10%
Midterm	15%
Departmental Final Exam	25%

**MAT 120-136A [44612]  
Course Outline for SPRING 2026**

**Bluman, A. G. (2018). *Elementary statistics: A step-by-step approach* (8th ed.). Publisher.**  
<https://ugess3.wordpress.com/wp-content/uploads/2016/01/bluman-step-by-step-statistics-8th-edition.pdf>

Week	Chapter & Sections	Activities
1	Chapter 1: Introduction to Statistics - 1.1 What are Statistics? - 1.2 Types of Data	Class discussion: “What stats tell us vs. what AI tells us”; survey collection exercise
2	Chapter 2: Organizing Data - 2.1 Frequency Distributions - 2.2 Histograms, Bar Graphs, and Pie Charts	Create frequency tables; plot histograms and bar charts manually
3-4	Chapter 3: Descriptive Statistics - 3.1 Measures of Central Tendency (mean, median, mode) - 3.2 Measures of Variation (range, variance, standard deviation) - 3.3 Interpreting Descriptive Stats	Compute mean, median, mode, range, variance manually; class discussion on significance
5-6	Chapter 4: Probability Concepts - 4.1 Probability Rules - 4.2 Counting Methods	Solve probability exercises; small class experiments (coin flips, dice)
7	Chapter 5: Discrete Probability Distributions - 5.1 Expected Value - 5.2 Binomial Distribution	Analyze distributions of class-collected data
8	Chapter 6: Continuous Probability Distributions - 6.1 Normal Distribution - 6.2 Using z-scores	Calculate z-scores manually; interpret probabilities
9-10	Chapter 7: Sampling and Sampling Distributions - 7.1 Random Sampling - 7.2 Sampling Errors	Discuss sampling methods; simulate sample collections manually
11-12	Chapter 8: Estimation - 8.1 Point Estimation - 8.2 Confidence Intervals	Construct confidence intervals manually
12-13	Chapter 9: Hypothesis Testing - 9.1 One-Sample Tests - 9.2 Two-Sample Tests	Perform step-by-step hypothesis tests
14-15	Chapter 10: Correlation - 10.1 Scatterplots - 10.2 Pearson’s r	Plot data; compute correlation manually
	Chapter 11: Regression Analysis - 11.1 Linear Regression - 11.2 Interpreting Regression Coefficients -12–1 One-Way Analysis of Variance (ANOVA)	Fit linear regression manually; predict outcomes

## SYNCHRONOUS CLASS PROTOCOL

Purpose:

To ensure a respectful, engaging, and productive learning environment during live (real-time) class sessions.

### 1. Attendance & Punctuality

- Log in on time using your full, real name.
- Remain present for the entire session unless prior permission is granted.
- Use the chat to notify the instructor if you must step away briefly.

### 2. Technology Readiness

- Test your internet connection, microphone, and camera before class.
- Keep your device charged or plugged in.
- Have required materials (notebook, calculator, textbook, slides) ready.

### 3. Camera & Microphone Use

- Camera on is strongly encouraged to promote engagement (unless otherwise stated).
- Keep your microphone muted when not speaking.
- Use a headset, when possible, to reduce background noise.

### 4. Participation & Engagement

- Actively participate through verbal responses, chat, polls, or shared work.
- Use the “raise hand” feature before speaking.
- Stay focused on class activities; avoid multitasking.

### 5. Communication & Chat Etiquette

- Use respectful, academic language always.
- Keep chat messages relevant to the lesson.
- Do not interrupt others while they are speaking.

### 6. Academic Integrity

- Complete all in-class activities independently unless group work is assigned.
- Do not share answers inappropriately during quizzes or assessments.
- Follow all institutional academic honesty policies.

### 7. Breakout Rooms & Group Work

- Contribute actively and respectfully in breakout rooms.
- Assign roles if requested (facilitator, recorder, presenter).
- Return to the main room promptly when instructed.

### 8. Recording & Privacy

- Class sessions may be recorded for educational purposes.
- Do not record, screenshot, or share class content without permission.
- Respect the privacy of classmates and the instructor.

#### 9. Professional Conduct

- Dress and behave appropriately for an academic setting.
- Choose a neutral background when possible.
- Any disruptive behavior may result in removal from the session and disciplinary action.

#### 10. Questions & Support

- Ask questions during designated times or via chat/email.
- Reach out during office hours for additional support.
- Inform the instructor promptly about technical or access issues.

By attending the synchronous class, students agree to follow this protocol to maintain a positive and effective learning environment.