



## **MATH 93 - Foundational Mathematics for Statistics Course Outline**

**Approval Date:** 12/09/2021

**Effective Date:** 08/12/2022

### **SECTION A**

**Unique ID Number** CCC000602587

**Discipline(s)** Mathematics

**Division** Mathematics

**Subject Area** Mathematics

**Subject Code** MATH

**Course Number** 93

**Course Title** Foundational Mathematics for Statistics

**TOP Code/SAM Code** 1701.00 - Mathematics, General / E - Non-Occupational

**Rationale for adding this course to the curriculum** Change the name of the course to align with the name for the co-requisite to Statistics. Update online and distance education information.

**Units** 3

**Cross List** N/A

**Typical Course Weeks** 18

**Total Instructional Hours**

#### **Contact Hours**

**Lecture** 36.00

**Lab** 0.00

**Activity** 36.00

**Work Experience** 0.00

**Outside of Class Hours** 90.00

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**Total Contact Hours** 72

**Total Student Hours** 162

**Open Entry/Open Exit** No

**Maximum Enrollment** 30

**Grading Option** Letter Grade or P/NP

**Distance Education Mode** On-Campus  
**of Instruction** Hybrid  
Entirely Online  
Online with Proctored Exams

## SECTION B

**General Education Information:**

## SECTION C

### Course Description

**Repeatability** May be repeated 0 times

**Catalog Description** Math 93 provides students with the algebraic skills necessary for success in Statistics (Math 232). Students will learn to use core concepts from arithmetic, prealgebra, elementary and intermediate algebra, with emphasis on solving and graphing linear equations; modeling with linear functions; solving contextualized problems; and dimensional analysis. This course is not intended for math, science, computer science, business, or engineering majors.

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## SECTION D

### Condition on Enrollment

**1a. Prerequisite(s):** *None*

**1b. Corequisite(s):** *None*

#### 1c. Recommended

- It is expected that students have a fundamental understanding of signed numbers, including decimals and fractions.

**1d. Limitation on Enrollment:** *None*

## SECTION E

### Course Outline Information

#### 1. Student Learning Outcomes:

- Perform arithmetic and/or algebraic operations, as needed for statistics calculations.
- Create graphs such as histograms, dot-plots and lines.
- Interpret the slope and y-intercept of a linear equation.

#### 2. Course Objectives: Upon completion of this course, the student will be able to:

- Perform arithmetic operations involving integers, fractions and decimals.
- Identify common irrational numbers used in statistics.
- Convert between scientific notation and decimal notation.
- Convert between units of measure.
- Use the Order of Operations to simplify expressions.
- Translate English sentences into mathematical expressions, equations and inequalities.
- Solve equations and inequalities with one variable.
- Graph solutions to equations and inequalities with one variable on the number line.

- I. Understand and appropriately use interval notation, including identification of number both in and out of closed and open intervals
- J. Understand and apply a Problem-Solving Method.
- K. Solve literal equations.
- L. Interpret scatterplots.
- M. Graph linear equations.
- N. Understand and interpret slope and y-intercept.
- O. Understand and use various kinds of set notation.
- P. Apply basic principles of counting.
- Q. Write and compute sums using sigma notation.
- R. Find the area under a linear function.
- S. Identify the graphs of functions used in statistics, such as exponential, logarithmic, rational exponent and power functions.
- T. Use appropriate and effective student skills
- U.

### 3. Course Content

- A. Arithmetic Operations and Numbers
  - a. Identify integers, fractions, decimals, percentages and irrational numbers.
  - b. Arithmetic operations using fractions and decimals by hand.
  - c. Round decimals.
  - d. Reduce fractions to lowest terms.
  - e. Convert between decimal, fraction and percent notation.
  - f. Convert between scientific and decimal notation.
  - g. Calculate and interpreting percentages and percent error.
  - h. Convert quantities between units of measurement.
- B. Introduction to Expressions and Equations
  - a. Translate English sentences into mathematical expressions, equations and inequalities.
  - b. Evaluate and simplify expressions using the Order of Operations.
  - c. Evaluate expressions using given values.
  - d. Evaluate expressions using square roots.
- C. Equations, Inequalities and Problem Solving
  - a. Solve equations in one variable requiring several steps using the Addition and Multiplication Properties as well as the distributive law.
  - b. Solve literal equations involving fractions, squares and square roots.
  - c. Convert plus/minus notation to interval notation.
  - d. Solve compound inequalities.
  - e. Use interval and plus/minus notation for solutions to compound inequalities in context.
  - f. Use a Problem-Solving method to solve word problems.
- D. Linear Equations in Two Variables
  - a. Graph points on a plane.
  - b. Graph scatterplots using application data.
  - c. Identify Independent and Dependent Variables.
  - d. Identify linear equations in two variables.
  - e. Determine the intercepts of graphs of Linear Equations.
  - f. Compute the slope of a line through two points.
  - g. Graph a line using the slope and a point.
  - h. Determine the slope and y-intercept of a Line given the statistical linear equation.
  - i. Interpret the slope and y-intercept of a linear model.

- j. Write and solve linear equations to model data.
- E. Fundamentals of Sets
  - a. Use list notation to write sets.
  - b. Determine the intersection, union and complement of sets.
  - c. Construct and use Venn diagrams.
  - d. Construct a tree diagram and apply the multiplication principle to count outcomes.
  - e. Use factorial notation.
  - f. Compute sums involving constants and powers.
  - g. Compute the square of a sum and the sum of a square.
- F. Introduction to Functions
  - a. Find the domain and range of a function.
  - b. Evaluate functions in an application.
  - c. Find the area under constant and linear functions.
  - d. Identify graphs of functions used in statistics, such as exponential, logarithmic, rational exponent and power functions.
- G. Effective Student Skills
  - a. Affective Domain exercises including Growth Mindset and Grit
  - b. Effective note taking and study strategies
  - c.

#### 4. Methods of Instruction:

**Activity:**

**Directed Study:**

**Discussion:**

**Lecture:**

**Projects:**

**Online Adaptation:** Activity, Directed Study, Discussion, Group Work

**Explain how the online adaptation of the methods of instruction aligns with the course**

**outcomes:** Online adaptation will include some combination of; video instruction, live and/or recorded online meetings, online meetings including breakout rooms, discussion boards.

Use of these methods will provide students with a robust exposure to course outcomes and objectives while also providing detailed instruction, feedback and interaction from the instructor.

**4. Methods of Evaluation:** Describe the general types of evaluations for this course and provide at least two, specific examples.

#### **Typical classroom assessment techniques**

Exams/Tests --

Quizzes --

Projects --

Home Work --

Final Exam --

Additional assessment information:

Example Questions:

1. Suppose total cholesterol levels between 220 and 270 milligrams per deciliter, not including 220 and 270, are considered borderline. Letting  $x$  represent a patient's total blood cholesterol level, write an inequality that describes the ranges corresponding to the borderline of total blood cholesterol. Then give the solution to the inequality in interval notation.

2. State and interpret the slope of the of the line given by the equation;  $\text{Calories} = 25.7 + .05\text{Fat}$

Letter Grade or P/NP

**5. Assignments:** State the general types of assignments for this course under the following categories and provide at least two specific examples for each section.

A. Reading Assignments

Read the section on slope as a rate of change before our next class and be ready to apply those concepts to an in-class activity.

B. Writing Assignments

Example 1. Online or Paper Homework: Complete assigned exercises from the applicable section in the text.

Example 2. Group Project: Given the scatterplot and regression equation, determine whether or not there is linear correlation between the data sets. In addition, interpret the slope and y-intercept of the regression equation.

C. Other Assignments

D.

**6. Required Materials**

**A. EXAMPLES of typical college-level textbooks (for degree-applicable courses) or other print materials.**

Book #1:

Author: The Consortium for Foundation Mathematics  
Title: Mathematics in Action. An introduction to algebraic, graphical, and numerical problem solving.  
Publisher: Pearson Education  
Date of Publication: 2016  
Edition: 5th

Book #2:

Author: Davis, Armstrong, McCraith  
Title: PreStatistics  
Publisher: Cengage  
Date of Publication: 2019  
Edition: 1st

**B. Other required materials/supplies.**

- These texts may be accompanied by an online homework component in the platform of the publisher.