

# Syllabus: Course Policies and Procedures

## Contact Information

**Instructor:**

**Email:**

**Phone:**

**Office Hours:**

## Course Information

**Course Titles:** Introduction to Statistics with Integrated Support and Integrated Support for Non-Algebra Pathway

**Course Numbers:** MATH158S and MATH061

**Semester:**

**Class Meetings:**

**Classroom:**

## Course Descriptions and Prerequisites

- *MATH158S Introduction to Statistics with Integrated Support:* This course provides a basic introduction to statistics. It is recommended for students in business, social science, human resources, allied health, and criminal justice and provides an excellent preparation for any career. Topics include descriptive statistics, probability, probability distributions, the normal distribution, hypothesis testing, estimates and sample sizes, the chi square distribution, correlation, and regression. Corequisite: MATH061 Integrated Support for Non-Algebra Pathway.
- *MATH061 Integrated Support for Non-Algebra Pathway:* This course is designed to be paired with a college-level non-algebra sequence mathematics course to support underprepared students. Students review the skills necessary for success in the associated college-level course in an ongoing as-needed just-in-time fashion. Topics include: numeracy, basic data analysis, proportional reasoning, an introduction to algebraic expressions and algebraic reasoning, and linear functions. Note: credits earned in this course cannot be applied toward graduation. Corequisite: MATH154S Topics in Mathematics with Integrated Support or MATH158S Introduction to Statistics with Integrated Support.

## Required Materials

- For this course we will use the following textbook: Triola, *Elementary Statistics*, 14<sup>th</sup> edition, Pearson, 18-week MyMathLab Code: 9780136803102.
- A Texas Instruments TI-83/84 graphing calculator is required for these courses and can be rented from the college for a small fee.

## Instructional Objectives/Student Learning Outcomes

*MATH158S Introduction to Statistics with Integrated Support:*

| COURSE OUTCOMES                                                                                                                                            | OUTCOMES ACTIVITIES                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
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| Upon successful completion of this course students should:                                                                                                 | To achieve these outcomes students may engage in the following activities:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Understand and be able to use the basic definitions and rules of descriptive statistics in order to apply them later in this course and in the real world. | <ol style="list-style-type: none"> <li>1. Draw and interpret histograms, circle graphs, and box and-whisker plots.</li> <li>2. OPTIONAL: Draw and interpret frequency polygons, dot plots and stem-and-leaf plots.</li> <li>3. Find the mean, median, mode, range, and standard deviation of ungrouped data.</li> <li>4. Summarize data using frequency tables.</li> <li>5. Find the mean from a frequency table.</li> <li>6. OPTIONAL: Find the standard deviation from a frequency table.</li> <li>7. Find percentiles and quartiles.</li> <li>8. OPTIONAL: Find Deciles.</li> </ol>                                                                                                                                                                                                       |
| Use the rules of basic probability in order to solve related problems.                                                                                     | <ol style="list-style-type: none"> <li>1. Apply the basic concepts of probability including the addition and multiplication rules.</li> <li>2. Find conditional probabilities.</li> <li>3. Find probabilities from contingency tables.</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Identify and use the rules for probability distributions in order to solve related problems.                                                               | <ol style="list-style-type: none"> <li>1. Determine if a given set of circumstances satisfies the requirements of a probability distribution.</li> <li>2. Find the mean, standard deviation, and expected value for a probability distribution.</li> <li>3. Know when to use the binomial distribution.</li> <li>4. Find the probability of an event, the mean, and the standard deviation given a binomial distribution.</li> <li>5. Solve problems involving the normal distribution. <ol style="list-style-type: none"> <li>a. Find z-scores.</li> <li>b. Find probabilities.</li> <li>c. Find the data value for a given probability.</li> <li>d. Apply the Central Limit Theorem.</li> <li>e. OPTIONAL: Use a normal approximation to the binomial distribution.</li> </ol> </li> </ol> |
| Determine how effective sample data is in estimating the value of a population parameter.                                                                  | <ol style="list-style-type: none"> <li>1. Calculate the confidence interval for the mean with large and small samples.</li> <li>2. Calculate the confidence interval for proportions.</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

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|                                                                                                                                                                                             | <ol style="list-style-type: none"> <li>3. OPTIONAL: Calculate the confidence interval for standard deviation or variance.</li> <li>4. Calculate sample size for means and proportions.</li> </ol>                                                                                                                                                                          |
| Use the standard procedures involved in hypothesis testing in order to determine if a claim is supported by the sample data.                                                                | <ol style="list-style-type: none"> <li>1. Apply tests involving the mean with large and small samples.</li> <li>2. Apply tests involving a proportion.</li> <li>3. Use p-values to determine if the null hypothesis should be rejected.</li> </ol>                                                                                                                         |
| Solve problems involving linear correlation and regression in order to determine whether there is a relationship between two sets of data and, if so, to identify what the relationship is. | <ol style="list-style-type: none"> <li>1. Calculate a linear correlation coefficient.</li> <li>2. Find the least square regression line and use it to predict values.</li> </ol>                                                                                                                                                                                           |
| Apply the $\chi^2$ -distribution in order to solve related problems.                                                                                                                        | <p>The course must include at least one of the following:</p> <ol style="list-style-type: none"> <li>1. Determine Goodness-of-Fit.</li> <li>2. Determine independence of events from contingency tables.</li> <li>3. Calculate the confidence intervals for standard deviation or variance.</li> <li>4. Apply tests involving a standard deviation or variance.</li> </ol> |
| To strengthen Core Competencies** in order to increase success in this and other courses and in the workplace.                                                                              | Referenced above                                                                                                                                                                                                                                                                                                                                                           |

*MATH061 Integrated Support for Non-Algebra Pathway:*

| COURSE OUTCOMES                                                                                                                                                        | OUTCOMES ACTIVITIES                                                                                                                                                                                                                                                                      |
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| At the end of this course, students will be able to                                                                                                                    |                                                                                                                                                                                                                                                                                          |
| Successfully complete MATH154S Topics in Mathematics with Integrated Support or MATH158S Introduction to Statistics with Integrated Support.                           | 1. Review prerequisite knowledge in an as needed, just-in-time fashion.                                                                                                                                                                                                                  |
| Explain information presented in mathematical forms (e.g., equations, graphs, diagrams, tables, words)                                                                 | 4. Interpret the graph of a linear function.<br>5. Solve appropriate real-world application problems.                                                                                                                                                                                    |
| Convert relevant information into various mathematical forms (e.g., equations, graphs, diagrams, tables, words)                                                        | 6. Translate English statements into algebraic expressions and equations.<br>7. Connect the table-of-values, graph, and equation representations of linear equations.<br>8. Model real-world problems using equations and graphs.                                                        |
| Perform arithmetic and algebraic calculations (e.g., adding fractions, factoring quadratic expressions, solving quadratic equations).                                  | 5. Review arithmetic and prealgebra calculations such as adding fractions.<br>6. Review introductory algebra concepts such as solving and graphing linear equations.<br>7. Review intermediate algebra concepts such as factoring quadratic expressions and solving quadratic equations. |
| Make judgements and draw appropriate conclusions based on the quantitative analysis of data, while recognizing the limits of this analysis.                            | 4. Solve real world applications problems.                                                                                                                                                                                                                                               |
| Make and evaluate important assumptions in estimation, modeling, and data analysis                                                                                     | 3. Solve real world applications problems.                                                                                                                                                                                                                                               |
| Express quantitative evidence in support of the argument or purpose of work (in terms of what evidence is used and how it is formatted, presented, and contextualized) | 5. Solve real world applications problems.                                                                                                                                                                                                                                               |

## Teaching Procedures

This course will be taught in a lecture/discussion format with ample opportunity for student questions. Generally, class will begin with a question and answer session on the most recent homework assignment. New material will then be presented in a lecture format and homework be assigned to reinforce the topics covered in class.

## Course Topics, Assignments, and Readings

|                                                                 |
|-----------------------------------------------------------------|
| <b>Topics</b>                                                   |
| 1.1 Statistical and Critical Thinking                           |
| 1.2 Types of Data                                               |
| 1.3 Collecting Sample Data                                      |
| 1.4 Ethics in Statistics                                        |
| 2.1 Frequency Distributions for Organizing and Summarizing Data |
| 2.2 Histograms                                                  |
| 2.3 Graphs that Enlighten and Graphs That Deceive               |
| 2.4 Scatterplots, Correlation, and Regression                   |
| <b>Exam 1</b>                                                   |
| 3.1 Measures of Center                                          |
| 3.2 Measures of Variation                                       |
| 3.3 Measures of Relative Standing and Boxplots                  |
| 4.1 Basic Concepts of Probability                               |
| 4.2 Addition Rule and Multiplication Rule                       |
| 4.3 Complements, Conditional Probability, and Bayes' Theorem    |
| 4.4 Counting                                                    |
| <b>Exam 2</b>                                                   |
| 5.1 Probability Distributions                                   |
| 5.2 Binomial Probability Distributions                          |
| 6.1 The Standard Normal Distribution                            |
| 6.2 Real Applications of Normal Distributions                   |
| 6.3 Sampling Distributions and Estimators                       |
| 6.4 The Central Limit Theorem                                   |
| 6.5 Assessing Normality                                         |
| <b>Exam 3</b>                                                   |
| 7.1 Estimating a Population Proportion                          |
| 7.2 Estimating a Population Mean                                |
| 7.3 Estimating a Population Standard Deviation or Variance      |
| 8.1 Basics of Hypothesis Testing                                |
| 8.2 Testing a Claim About a Proportion                          |
| 8.3 Testing a Claim About a Mean                                |
| 8.4 Testing a Claim About a Standard Deviation or Variance      |
| 10.1 Correlation                                                |
| 10.2 Regression                                                 |
| <b>Final Exam</b>                                               |

## Tentative Test Schedule

- Exam 1:
- Exam 2:
- Exam 3:
- Final Exam:

## Basis for Student Grading

Grades for these courses will be assigned as follows based on the percentages. You will be assigned the same grade for both courses.

|    |            |
|----|------------|
| A  | 93% - 100% |
| A- | 90% - 92%  |
| B+ | 87% - 89%  |
| B  | 83% - 86%  |
| B- | 80% - 82%  |
| C+ | 77% - 79%  |
| C  | 73% - 76%  |
| C- | 70% - 72%  |

|    |           |
|----|-----------|
| D+ | 67% - 69% |
| D  | 63% - 66% |
| D- | 60% - 62% |
| F  | 0% - 59%  |

## Basis for Evaluating Student Performance

The grade for this course will be determined by the percentage of points earned to total points available, based on the following categories:

- Exams (75%): There will be three in-class exams given during the semester. Each exam will account for 25% of your final grade.
- Final Exam (25%): There will be a cumulative final exam given at the end of the course worth 25% of your final grade.

## Attendance Policy

Attendance for this course is mandatory and students are expected to attend all class meetings.

## Access & Disability Resources

The Office of Access & Disability Resources (ADR) is committed to ensuring that students with disabilities have equal, effective, and meaningful access to all academic programs, community events, goods, and services provided by the College in compliance with the Americans with Disabilities Act and Section 504 of the Rehabilitation Act. Students with disabilities interested in establishing eligibility for services and/or academic accommodations will need to voluntarily disclose their disability to ADR, submit qualifying documentation and complete an ADR Intake meeting. During the meeting reasonable and appropriate academic accommodations will be determined. Visit the [Office of Access and Disability Services website](#) for more information and to begin the process to establish eligibility.

ADR uses a platform called Accommodate to manage the accommodation process. To make an initial accommodation request, please [submit a request through Accommodate to ADR](#).

Returning students with accommodations previously approved can request updated Accommodation Letters by accessing the ADR card in the MyMassasoit student portal. Log into Accommodate and click on Semester Request.

Students are expected to check in with faculty regarding approved accommodations. Communication between students, faculty, and ADR is key to successful accommodation implementation.

Students can contact ADR at 508-588-9100 x1807 or by email at [adr@massasoit.mass.edu](mailto:adr@massasoit.mass.edu).

Visit [the ADR website](#) for more information.