

MATH M15H: Honors – Introductory Statistics

Course Objectives (COR)

- Summarize data graphically by displaying data using methods from descriptive statistics, interpreting data in tables graphically by using histograms, frequency distributions, box-and-whisker (five-number summary); find measures of central tendency for data sets: mean, median, and mode; find measures of variation for data sets: standard deviation, variance, and range; relative positions of data and distinguish among scales of measurements and their implications; distinguish between populations and samples; and identify the standard method of obtaining data and the advantages and disadvantages of each.
- Find simple probabilities and probabilities of compound events and compute probabilities using the complement, discrete probability distributions, apply concepts of sample space, the binomial probability distribution.
- Standardize a normally distributed random variable, use normal distribution tables to find probabilities for normally distributed random variables and the t-distribution, and use the Central Limit Theorem to find probabilities for sampling distributions.
- Construct and interpret confidence intervals for proportions and means.
- Identify the basics of hypothesis testing and perform hypothesis testing for means, proportions and standard deviations from one population, and difference of means and proportions from two populations, including finding and interpreting p-value and examining Type I and Type II error.
- Find linear least-squares regression equations for appropriate data sets, graph least-square regression equations on the scatter plot for the data sets, and find and apply the coefficient of correlation.
- Use the chi-square distribution to test independence and to test goodness of fit.
- Conduct a one-way Analysis of Variance (ANOVA) hypothesis test.
- Select an appropriate hypothesis test and interpret the result using p-value; use appropriate statistical technique to analyze and interpret applications based on data related to business, social sciences, psychology, life sciences, health sciences or education, and interpret results using technology-based statistical analysis.
- Honors: find probabilities using Poisson distributions.
- Honors: estimate binomial probabilities.
- Honors: find and use standard deviations.

Course Learning Outcomes (CLO)

- Construct a histogram for a given set of data. This can be done by hand or with a graphing calculator.
- Construct a single-sample confidence interval, and draw an appropriate conclusion. This can be done by hand or with a graphing calculator.
- Construct a single-sample hypothesis test based on a given claim, and draw an appropriate conclusion. This can be done by hand or with a graphing calculator.