

**Course Outline for: MATH 1080 Introduction to Statistics****A. Course Description**

1. Number of credits: 4
2. Lecture hours per week: 4
3. Prerequisites: MATH 0630 (C- or better); or  
MATH 0980 (C- or better); or  
Math 0601, 0602, or 0603 with mastery of sufficient topics; or  
High School GPA: 2.70+; or  
Accuplacer Quantitative Reason Score of 265+; or  
MCA Math score: 1148-1157
4. Corequisites: None
5. MnTC Goals #4.

Concepts and application of descriptive and inferential statistics. Measures of central tendency and variation: z-scores and percentiles, normal distribution, and central limit theorem. Estimation, hypothesis testing, t and z tests, chi-square tests, analysis of variance (ANOVA), and linear regression.

**B. Date last reviewed: March 2023****C. Outline of Major Content Areas**

1. Elements of experimental design - controlled experiments vs. observational studies
2. Statistical variables and variable values
3. Numerical measures of central tendency/variability - mean, median, mode, standard deviation, z-scores, and percentile rank
4. Graphical summaries of data - histograms
5. Normal approximation to data
6. Correlation coefficient and linear regression
7. Expected value and standard error for sampling distributions
8. Central limit theorem
9. Confidence intervals for population means and proportions
10. One and two sample hypothesis testing (z and t)
11. Chi-square test
12. Analysis of variance
13. Additional topics may include nonparametric tests, control charts, etc.

**D. Course Learning Outcomes**

Upon successful completion of MATH 1080, students will be able to:

1. Compute mean, median, modes, standard deviation, z-scores and percentile ranks from data, and give simple common sense interpretations of these numerical measures. (Goal 4b)
2. Construct histograms and graphical descriptions of numerical data, and estimate the common numerical measures from them. (Goal 4b)
3. Apply the normal approximation to estimate percentages and percentiles for data that are normally distributed. (Goal 4b, d)
4. Compute and interpret correlation coefficient as a measure of the strength of the linear association between two numerical variables. (Goal 4a, b, d)
5. Apply regression methods to estimate dependent variable values from a single independent variable value, and interpret the slope and constant in regression equations. (Goal 4a, b, c, d)
6. Compute and interpret the expected value and standard error for probability distributions. (Goal 4b, d)
7. Apply the central limit theorem to estimate probabilities of sample means and percentages falling in a range of values. (Goal 4b, d)
8. Compute and interpret confidence intervals for means and proportions. (Goal 4a, b, d)
9. Carry out one and two sample hypothesis test (z or t) for population means and percentages, including the formulation of null/alternative and interpretation of p-value. (Goal 4a, b, c, d)
10. Perform Chi-square tests of goodness of fit, independence, and homogeneity. (Goal 4a, b, c, d)
11. Perform analysis of variance. (Goal 4a, b, c, d)
12. Perform simple statistical procedures related to the above using a statistical package (e.g. Excel) or a statistical calculator (e. g. TI-83/84). (Goal 4a,b, d)

**E. Methods for Assessing Student Learning**

The instructor will choose from among various evaluation techniques including, but not limited to:

1. In-class testing
2. Take-home testing
3. Assignments
4. Quizzes
5. Attendance
6. Group or individual projects
7. Research
8. End-of--semester evaluation

**F. Special Information**

Your instructor will choose to use either Excel or TI-83/84 calculator or Minitab software or StatCrunch. After registering for your section, contact the instructor.