

Statistics

Textbook : Prentice-Hall, Statistics, Sullivan, 2nd edition

I have read and agree to all policies and procedures as stated in the Terra Nova Student Handbook.

California has only 8 standards for Statistics. They are located as a “pdf” file on the State webpage. The state webpage for all Math standards <http://www.cde.ca.gov/be/st/ss/documents/mathstandard.pdf>.

This course will go a little beyond the state standards, by doing some regression analysis, using z-scores, t-scores, some Chi-Square analysis, and analysis of confidence intervals for normal distributions of sample data.

Some review of Algebra Two material will be included during the course, specifically:

- 1) linear equations, systems of linear equations, and matrices during chapter 4 of the first semester
- 2) logarithms during chapter 6 of the second semester

There will also be at least 4 Excel projects involving handling data and organizing a basic statistical display of various data. The students will learn Excel as well.

The content of the course per semester and per chapter or unit of study is broken down as follows:

Semester One

Chapter 1

qualitative and quantitative statistical data, random samples, analysis of bias and errors from samples, understanding lurking variables, designing statistical experiments

Chapter 2

organizing data, frequency distributions, graphical display of data, relative and cumulative frequency, skewed data, stem & leaf plots, time-series plots, frequency ogives, study of misrepresentation of data

Chapter 3

Measures of Central Tendency & position, parameters and statistics from population and samples. mean, median, mode, standard deviation, variance, degrees of freedom, Chebychev's inequality, weighted means, determining median and standard deviation from grouped data, interpolation, z-scores, percentiles, quartiles, outliers, box & whiskers plots

Chapter 4

Review of linear equations and systems of equations

Review of matrices and matrix systems

Scatter diagrams, correlation, correlation coefficient, causation vs. lurking variable, least-squares regression, coefficient of determination, using matrices to fit data, transpose matrices

Chapter 5

empirical vs. theoretical probability, events, outcomes, venn diagrams, disjuncting sets, mutual exclusion, Or probability, Benford's law, or probability, independence and dependence, contingency tables,

conditional probability, Counting techniques, permutations and combinations, factorials, probabilities involving Permutations and Combinations; geometric probabilities and other counting processes.

Semester Two

Chapter 6

Review of logarithms and exponential growth

log regressions with exponential data

Chapter 7

Probability distributions, normal distributions, binomial theorem, binomial probability, cumulative distribution functions, using the z-score to determine probabilities, Normal probability plots, Binomial approximations to the Normal

Chapter 8

Sampling standard error, impact of sample size, non-normal populations, central Limit theorem, using proportions

Chapter 9

Confidence intervals, level of confidence, margin of error, t-distributions, Chi-square distributions

Chapter 10

Hypothesis testing

Chapter 11

Inferences between Two samples

If time permits

Chapter 12

Using the Chi-square distribution to Test Homogeneity of proportions in a contingency table.