

STATISTICS (STA)

STA 1013 - Statistics Through Examples (3 Credits)

This course provides students with a background in applied statistical reasoning. Fundamental topics are covered, including graphical and numerical description of data, understanding randomness, central tendency, correlation versus causation, line of best fit, estimation of proportions, and statistical testing. Statistical thinking, relevant ideas, themes, and concepts are emphasized over mathematical calculation. In this class students learn many of the elementary principles that underlie collecting data, organizing it, summarizing it, and drawing conclusions from it.

Prerequisite(s): MGF 1106 or MGF 1107 or MGF 1130

Attribute(s): GEST - Gen. Ed -Statistics, GRMT - Computation Skills, Gen. Ed -Statistics

STA 2023 - Statistical Methods (3 Credits)

In this course students will utilize descriptive and inferential statistical methods in contextual situations, using technology as appropriate. The course is designed to increase problem-solving abilities and data interpretation through practical applications of statistical concepts. This course is appropriate for students in a wide range of disciplines and programs.

Prerequisite(s): (MAT 1033 or MAC 1105 or MAC 1147 or MAC 2233 or MGF 1107 or MGF 1106) or (SAT Math Score with a score of 490 or MATH SECTION SCORE with a score of 520) or ACT Math with a score of 21 or (Accuplacer Algebra Subscore with a score of 090 or Mobius Alg&Pre-Calc Readiness Test with a score of 15) or PERT Mathematics with a score of 123 or ALEKS APPL with a score of 46

Attribute(s): CRIT - GE Critical Think Competency, GE Critical Think Competency, GE Quan Reasoning Competency, GEST - Gen. Ed -Statistics, GRMT - Computation Skills, Gen. Ed -Statistics, QUAN - GE Quan Reasoning Competency

STA 2122 - Social Science Statistics (3 Credits)

Intermediate course covering applied statistical analysis including analysis of variance, probability theory, correlation, non-parametric, and regression methods.

Prerequisite(s): STA 2023

Attribute(s): CRIT - GE Critical Think Competency, GE Critical Think Competency, GE Quan Reasoning Competency, GEMA - Gen. Ed -Math, GRMT - Computation Skills, Gen. Ed -Math, QUAN - GE Quan Reasoning Competency

STA 3038 - Prob & Stat for Data Sci (3 Credits)

This course covers the main mathematics, probability, and statistics topics necessary for a comprehensive understanding of data science. Overview and applications of math concepts in data science, linear algebra and calculus, probability and statistical inference, regression and Bayesian statistics, introduction to search and optimization, graph theory.

Prerequisite(s): STA 2023

STA 3163 - Applied Statistics (3 Credits)

An intermediate level survey of applied statistical methods with reference to practical problems in science and engineering. This course focuses on single and multi-sample inferential statistics, categorical data hypothesis testing, non-parametric methods, regression and correlation methods, experimental design and applications of statistical software.

Prerequisite(s): STA 2023 or STA 2037

Attribute(s): GRMT - Computation Skills, MRSE - Marine Sci Restrict Elec, SUSC - Sustainability Component

STA 4234 - Intro. to Regression Analysis (3 Credits)

Study of theory and applications of regression analysis. Topics include: general linear model, parameter estimation, residual analysis, polynomial and logarithmic regression, model identification, applications to biological and social sciences.

Prerequisite(s): (STA 2023 or STA 2037) and (MAC 2311 or MAC 2233)

Attribute(s): GRMT - Computation Skills, SUSC - Sustainability Component

STA 4502 - Nonparametric Inference (3 Credits)

Nonparametric inference involves the analysis of small data sets or data that do not follow a bell-shaped distribution. Applications will be drawn from areas such as education, economics, the biological or social sciences, among others. Emphasis will be placed on applied techniques which include Spearman's rho correlation, chi-squared tests, a confidence interval for the median, and 1-, 2-, and k-sample hypothesis tests.

Prerequisite(s): STA 2023 or STA 2037

STA 4853 - Time Series Analysis (3 Credits)

This is an introductory course, with emphasis on practical aspects of time series analysis. Methods are hierarchically introduced - starting with terminology and exploratory graphics, progressing to descriptive statistics, and ending with basic modeling procedures. Topics include detrending, filtering, autoregressive (ARMA) modeling, forecasting, and spectral analysis. Software such as S-plus, R, or MATLAB will be used.

Prerequisite(s): STA 2023 or STA 2037

Attribute(s): SUSC - Sustainability Component

STA 4930 - Special Topics in Statistics (3-4 Credits)

Topics of current or special interest in Statistics. Topics may vary according to interest and needs of instructor and students. Credit hours may vary.

Prerequisite(s): STA 2023

STA 5348 - Bayesian Data Analysis (3 Credits)

Fundamentals of Bayesian data analysis, methodologies, and applications. Topics include Bayes Theorem and the Bayesian approach, differences between Bayesian and Frequentist inference: estimating confidence intervals and high-density intervals and their interpretation, difference between posterior and prior distributions, selection of appropriate priors, Markov Chain Monte Carlo (MCMC) and Gibbs Sampling techniques, Hypothesis testing (and interval estimation) in Bayesian approaches, and model selection criteria and model fitting using data. Software such as R/Python and JAG/Stan will be used.

STA 5355 - Appl Mathematical Statistics (3 Credits)

Topics in applied mathematical statistics, including point and interval estimation, hypothesis testing, nonparametric methods, correlation, and design and analysis of experiments.

Attribute(s): GRMT - Computation Skills

STA 5666 - Statistical Quality Control (3 Credits)

This course will introduce students to the Six Sigma process for quality control that is commonly used in service and manufacturing industries. Students will learn about the DMAIC paradigm and determine whether a system based on variable or attribute data is in- or out-of-control using control charts such as X-bar, R, S, CUSUM, MA, and EWMA charts. Capability analysis and gauge R&R studies will be presented.