

STAT - Statistics

Courses numbered 100 to 299 = *lower-division*; 300 to 499 = *upper-division*; 500 to 799 = *undergraduate/graduate*.

STAT 370. Elementary Statistics (3). †

General education math and natural sciences course. Surveys elementary descriptive statistics, binomial and normal distributions, elementary problems of statistical inference, linear correlation and regression. Not open to mathematics majors. Students cannot receive credit for both STAT 171 and STAT 370. This is a Kansas Systemwide Transfer Course. Prerequisite(s): MATH 111 with a C or better or equivalent.

STAT 460. Elementary Probability and Mathematical Statistics (3).

General education math and natural sciences course. Covers elementary probability concepts, some useful discrete and continuous distributions and mathematical aspects of statistical inference including maximum likelihood estimation, confidence intervals, hypothesis testing and regression. Prerequisite(s): MATH 243 with a C or better.

STAT 570. Special Topics in Statistics (3).

An umbrella course created to explore a variety of subtopics differentiated by letter (e.g., 570A, 570B). Not all subtopics are offered each semester – see the course schedule for availability. Students enroll in the lettered courses with specific topics in the titles rather than in this root course. Prerequisite(s): departmental consent.

STAT 570G. Statistical Programming in R (3).

Introduces the R programming language for data management, visual representation of data, basic statistical tests, and utilizing R as a programming language for advanced statistical methodology. Topics include data import/export; data format and types; logical operators and control statements; program design; statistical graphics for exploratory data analysis; basic statistical testing; generating random variables and Monte Carlo simulations; and introduction to several advanced computational statistical methods. Prerequisite(s): departmental consent.

STAT 570I. Introduction to Biostatistics (3).

Aims to provide a solid undergraduate foundation in biostatistics and its applications in practical problems. Topics include statistical estimation, hypothesis testing, calculation of power and sample size, and analysis of epidemiologic studies. To succeed in this course, basic calculus and STAT 571 knowledge is required prior to course enrollment. Prerequisite(s): MATH 344 and STAT 571.

STAT 571. Statistical Methods I (3).

General education math and natural sciences course. Includes probability models, points and interval estimates, statistical tests of hypotheses, correlation and regression analysis, introduction to nonparametric statistical techniques, least squares, analysis of variance, and topics in design of experiments. Prerequisite(s): MATH 243 with a grade point of 2.000 or better, or departmental consent.

STAT 572. Statistical Methods II (3).

General education math and natural sciences course. Includes probability models, points and interval estimates, statistical tests of hypotheses, correlation and regression analysis, introduction to nonparametric statistical techniques, least squares, analysis of variance, and topics in design of experiments. Prerequisite(s): MATH 243 with a grade point of 2.000 or better, or departmental consent.

STAT 574. Elementary Survey Sampling (3).

Reviews basic statistical concepts. Covers simple, random, stratified, cluster and systematic sampling, along with a selection of sample size, ratio, estimation and costs. Applications studied include problems

from social and natural sciences, business and other disciplines. Prerequisite(s): any elementary course in statistics, such as STAT 370, SOC 501 or PSY 301 with a grade point of 2.000 or better.

STAT 701. Matrix Theory (3).

Studies matrix theory as a tool for studying linear models, analysis of variance, regression analysis, time series, and multivariate analysis. Topics include Eigenvalues and Eigenvectors, matrix factorization and matrix norms, generalized inverses, partitioned matrices, Kronecker product, vec operator, and matrix derivatives, with applications to statistics in each topic and special emphasis on quadratic forms in normal variates. Although some background in statistics is desirable, it is not necessary. Prerequisite(s): MATH 511 with a grade point of 2.000 or better.

STAT 761. Probability (3).

A study of axioms of probability, discrete and continuous random variables, expectation, examples of distribution functions, moment generating functions, and sequences of random variables. Prerequisite(s): MATH 344 with a grade point of 2.000 or better.

STAT 763. Applied Regression Analysis (3).

Studies linear, polynomial and multiple regression. Includes applications to business and economics, behavioral and biological sciences, and engineering. Uses computer packages for doing problems. Prerequisite(s): STAT 571, MATH 344 and 511 with a grade point of 2.000 or better in each, or departmental consent.

STAT 764. Analysis of Variance (3).

An introduction to experimental design and analysis of data under linear statistical models. Studies single-factor designs, factorial experiments with more than one factor, analysis of covariance, randomized block designs, nested designs, and Latin square designs. Uses computer packages for doing problems. Prerequisite(s): STAT 571, MATH 344 and 511 with a grade point of 2.000 or better in each, or departmental consent.

STAT 771. Theory of Statistics I (3).

An examination of stochastic dependence distributions of functions of random variables limiting distributions, order statistics, theory of statistical inference, non-parametric tests, and analysis of variance and covariance. Prerequisite(s): MATH 547 with a grade point of 2.000 or better, or departmental consent.

STAT 772. Theory of Statistics II (3).

An examination of stochastic dependence distributions of functions of random variables limiting distributions, order statistics, theory of statistical inference, non-parametric tests, and analysis of variance and covariance. Prerequisite(s): MATH 545 or 547 with a grade point of 2.000 or better, or departmental consent.

STAT 774. Statistical Computing I (3).

Trains students to use modern statistical software for statistical modeling and writing of technical reports. Examines many of the advanced features of most commercial statistical packages. Students perform complete statistical analyses of real data sets. Prerequisite(s): STAT 763 and 764, or departmental consent.

STAT 775. Applied Statistical Methods I (3).

Covers selected topics from time series analysis including basic characteristics of time series, autocorrelation, stationarity, spectral analysis, linear filtering, ARIMA models, Box-Jenkins forecasting and model identification, classification, and pattern recognition. Prerequisite(s): STAT 763 with a grade point of 2.000 or better, or departmental consent.

STAT 776. Applied Statistical Methods II (3).

Covers selected topics from multivariate analysis including statistical theory associated with the multivariate normal, Wishart

and other related distributions, partial and multiple correlation, principal component analysis, factor analysis, classification and discriminant analysis, cluster analysis, James-Stein estimates, multivariate probability inequalities, majorization and Schur functions. Prerequisite(s): STAT 764 with a grade point of 2.000 or better, or departmental consent.