STATISTICS (STAT)

STAT 263  Introduction to Statistics  3 Credit Hours
Frequency distributions and descriptive measures. Populations, sampling, and statistical inference. Elementary probability and linear regression, use of statistical computer packages to analyze data. Students intending to elect this course should have taken at least one year of high school algebra. (F,W,S).

STAT 301  Biostatistics I  3 Credit Hours
Samples and populations, quantitative vs. categorical data; clinical vs. epidemiological studies; comparative displays and analysis; linear regression. Estimation of effect size is emphasized along with the P-value for a statistical test: difference of means in simple comparative data together with a confidence interval and t-test; relative risk for appropriate categorical data; slope of a regression line together with a confidence interval and t-test. Study design is emphasized: clinical trials in experimental settings; case-control and cohort studies in epidemiological settings. Students are expected to make presentations interpreting and reporting the results of research from the literature. Students can receive credit for only one of MATH 301, MATH 363, STAT 301, CRJ 383, SOC 383, STAT 325.
Prerequisite(s): MATH 113 or MATH 115

STAT 305  Intro. to Data Science  3 Credit Hours
With increasing availability of data, companies, governments, and nonprofits alike are striving to convert this data into knowledge and insight. This course will provide students with the basic skill set needed to handle such data. The course will focus on three broad areas: inferential thinking, computational thinking, and real-word applications. We will discuss data collection, data cleaning and exploratory analysis of data so that students can connect the data to the underlying phenomena and be able to think critically about the conclusions that are drawn from the data analysis. The students will also learn how to write short programs to be able to automate the data analysis process developing an applied understanding of different analytics methods, including linear regression, logistic regression, clustering, data visualization, etc. Most of the material will be taught using real world data. (YR)

STAT 325  Applied Statistics I  4 Credit Hours
This course studies the principles and applications of statistics. Topics include descriptive statistics, random variables, probability distributions, sampling distributions, the central limit theorem, confidence intervals, hypothesis testing for mean and variance and the use of normal, chi-square, F and t distributions in statistical problems. Other topics are selected from regression and correlation, the design of experiments and analysis of variance. Students can receive credit for only one of CRJ 383, MATH 301, 363, STAT 301, 363, SOC 363 and STAT 325. (F,W)
Prerequisite(s): MATH 113 or MATH 115 or Mathematics Placement with a score of 116

STAT 327  Statistical Computing  3 Credit Hours
This course focuses on computational techniques that are crucial for statistics applications. Using the statistical packages R and SAS, the course teaches students about importing and storing data, manipulating and visualizing data, debugging and re-sampling, as well as simulation methods including bootstrap and Monte Carlo methods. (YR)
Prerequisite(s): STAT 325

STAT 330  Intro to Survey Sampling  3 Credit Hours
An introduction to survey sampling techniques assuming only a limited knowledge of higher-level mathematics. Topics include: simple and stratified random sampling, estimation, systematic sampling, simple and two stage cluster sampling, population size estimation.
STAT 460  Time Series Analysis   3 Credit Hours
An Introduction to time series, including trend effects and seasonality, while assuming only a limited knowledge of higher-level mathematics. Topics include: linear Gaussian processes, stationarity, autocovariance and autocorrelation; autoregressive (AR), moving average (MA) and mixed (ARMA) models for stationary processes; likelihood in a simple case such as AR(1); ARIMA processes, differencing, seasonal ARIMA as models for non-stationary processes; the role of sample autocorrelation, partial autocorrelation and correlograms in model choice; inference for model parameters; forecasting: dynamic linear models and the Kalman filter.

Prerequisite(s): STAT 430

STAT 490  Topics in Applied Statistics   3 Credit Hours
STAT 490A  Topics in Applied Statistics   3 Credit Hours
TOPIC TITLE: Multivariate Statistical Analysis A coverage of commonly encountered statistical and multivariate techniques, while assuming only a limited knowledge of higher-level mathematics. Topics include: Multivariate analysis of variance, multivariate regression, principal components and factor analysis, canonical correlation, discriminant analysis, and cluster analysis.

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering

The following abbreviations are used to denote the frequency of offering: (F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally