STATISTICS

Course Search
Not all courses are offered every semester. Refer to the schedule of courses for each term’s specific offerings.

Courses

STA 2023 Introduction to Statistics 1 3 Credits
Graphical and numerical descriptive measures. Simple linear regression. Basic probability concepts, random variables, sampling distributions, central limit theorem. Large and small sample confidence intervals and significance tests for parameters associated with a single population and for comparison of two populations. Use of statistical computer software and computer applets to analyze data and explore new concepts. (M)
General Education - Mathematics

STA 3024 Introduction to Statistics 2 3 Credits
Prereq: STA 2023 or the equivalent
General Education - Mathematics

STA 3032 Engineering Statistics 3 Credits
The basic concepts in probability and statistics with engineering applications. Topics include probability, discrete and continuous random variables, estimation, hypothesis testing, and linear and multiple regression. (M)
Prereq: MAC 2311
General Education - Mathematics

STA 4183 Theory of Interest 3 Credits
Measurement of simple and compound interest, accumulated and present value. Annuities, yield rates, amortization schedules, sinking funds, bonds, securities and related funds.
Prereq: MAC 2312

STA 4210 Regression Analysis 3 Credits
Simple linear regression and multiple linear regression models. Inference about model parameters and predictions, diagnostic and remedial measures about the model, independent variable selection, multicollinearity, autocorrelation and nonlinear regression. SAS implementation of the above topics.
General Education - Mathematics

STA 4211 Design of Experiments 3 Credits
The basic principles of experimental design: analysis of variance for experiments with a single factor; randomized blocks and Latin square designs; multiple comparison of treatment means; factorial and nested designs; analysis of covariance; response surface methodology.
Prereq: STA 4210

STA 4222 Sample Survey Design 3 Credits
An introduction to the design of sample surveys and the analysis of survey data, the course emphasizes practical applications of survey methodology. Topics include sources of errors in surveys, questionnaire construction, simple random, stratified, systematic and cluster sampling, ratio and regression estimation, and a selection of special topics such as applications to quality control and environmental science.
Prereq: STA 4321 and either STA 2023 or STA 3032 or STA 4222
General Education - Mathematics

STA 4321 Introduction to Probability 3 Credits
Introduction to the theory of probability, counting rules, conditional probability, independence, additive and multiplicative laws, Bayes Rule. Discrete and continuous random variables, their distributions, moments and moment generating functions. Multivariate probability distributions, independence, covariance. Distributions of functions of random variables, sampling distributions, central limit theorem.
Prereq: STA 4321 or the equivalent
General Education - Mathematics

STA 4502 Nonparametric Statistical Methods 3 Credits
Introduction to nonparametric statistics, including one- and two-sample testing and estimation methods, one- and two-way layout models and correlation and regression models.
Prereq: STA 2023 or STA 3032 or STA 4210 or STA 4322

STA 4504 Categorical Data Analysis 3 Credits
Description and inference using proportions and odds ratios, multi-way contingency tables, logistic regression and other generalized linear models, log-linear models applications.
Prereq: STA 3024 or STA 3032 or STA 4210 or STA 4322

STA 4702 Multivariate Statistical Methods 3 Credits
Review of matrix theory, univariate normal, t, chi-squared and F distributions and multivariate normal distribution. Inference about multivariate means including Hotelling’s T2, multivariate analysis of variance, multivariate regression and multivariate repeated measures. Inference about covariance structure including principal components, factor analysis and canonical correlation. Multivariate classification techniques including discriminant and cluster analyses. Additional topics at the discretion of the instructor, time permitting.
Prereq: (STA 3024 or STA 4210 or STA 4322 or STA 6127 or STA 6167) and either MAS 3114 or MAS 4105 or the equivalent

STA 4712 Introduction to Survival Analysis 3 Credits
Survival analysis data methods including Kaplan-Meier and Nelson estimators of the survival, accelerated failure time and proportional hazards models and frailty and recurrent event models.
Prereq: STA 4210

STA 4821 Stochastic Processes 3 Credits
Theoretical development of elementary stochastic processes, including Poisson processes and their generalizations, Markov chains, birth and death processes, branching processes, renewal processes, queuing processes and genetic and ecological processes.
Prereq: STA 4321 or equivalent
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>STA 4853</td>
<td>Introduction to Time Series and Forecasting</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Stationarity, autocorrelation, ARMA models; frequency domain methods and the spectral density; forecasting methods; and computationally-oriented application to case studies.</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Prereq:</strong> STA 4210 and STA 4321</td>
<td></td>
</tr>
<tr>
<td>STA 4905</td>
<td>Individual Work</td>
<td>1-5</td>
</tr>
<tr>
<td></td>
<td>Special topics designed to meet the needs and interests of individual students.</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Prereq:</strong> department permission</td>
<td></td>
</tr>
<tr>
<td>STA 4911</td>
<td>Undergraduate Research in Statistics</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Course provides firsthand, supervised research in Statistics. Projects may involve inquiry, design, investigation, scholarship, discovery or application in Statistics.</td>
<td></td>
</tr>
<tr>
<td>STA 4930</td>
<td>Special Topics</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Variable topics designed to meet the students’ needs and interests.</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Prereq:</strong> department permission</td>
<td></td>
</tr>
<tr>
<td>STA 4940</td>
<td>Internship</td>
<td>1-3</td>
</tr>
<tr>
<td></td>
<td>Supervised activity associated with planning and/or analyzing data from a research project. Supervision by a faculty member or delegated authority and a post-internship written report are required. (S-U)</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Prereq:</strong> STA 4211 and undergraduate coordinator permission</td>
<td></td>
</tr>
</tbody>
</table>