STA   Master of Science in Applied Statistics

STA 645 COMPUTATIONAL THEORY AND DATA VISUALIZATION   (3)

This course aims to teach students to use programming to gain intuition about statistical theory and fundamental concepts and to visualiz data appropriately. Specifically, computational methods covered include simulation methods and numerical methods in maximization an integration. Appropriate graphical displays of statistical and simulation results will be emphasized. Statistical concepts covered include sampling distributions, confidence intervals and p-values, the central limit theorem, expectation, and maximum likelihood estimation. Student understanding of course ideas will rely heavily on performing simulation studies and discussing the assimilated class results online.

STA 646 FOUNDATIONS OF PROBABILITY AND INFERENCE   (4)

This course introduces probability, random variables, independence, and distribution theory. Inference topics include, but are not limited to, estimation, hypothesis tests, likelihood ratio tests, confidence intervals, sufficiency, and efficient estimators.

STA 647 STATISTICAL COMPUTING WITH SAS   (2)

This course aims to teach students to use the SAS statistical programming language and to apply this knowledge appropriately in a variety of settings. Student achievement in the course will rely heavily on performing computational tasks, data management, editing data, running basic statistical procedures, and producing reports using SAS.

STA 648 REGRESSION MODELING   (4)

Simple and multiple linear regression, diagnostics, model selection, nonparametric regression, models with categorical variables.

STA 649 DESIGN OF EXPERIMENTS   (4)

Common experimental designs, analysis of variance (ANOVA) for different experimental designs, methods for variance reduction in experimental design, designs with quantitative and qualitative treatments, post-hoc ANOVA testing using multiple comparisons, response surface methodology.

STA 650 APPLIED MULTIVARIATE ANALYSIS   (3)

Multivariate Descriptive Measures, Graphical Displays for Multivariate Data, Inference on Mean Vectors, Multivariate Relationships, Inference on Covariance Structures, Dimension Reduction, Classification and Discrimination, Clustering and Ordination

STA 651 ADVANCED PROGRAMMING WITH R   (1)

Handling various facets of data structures in R, producing simple and advanced graphics in R, and mastering the components of simulation studies.

STA 652 ADVANCED STATISTICAL MODELING   (3)

This course aims to teach students to use advanced statistical modeling techniques and to interpret the results in context. Specifically, the statistical methods covered include general linear models and linear mixed models, semiparametric regression, nonlinear models, mixed models in ANOVA, generalized linear models, ridge regression, and repeated measures experiments.

STA 654 APPLIED BAYESIAN ANALYSIS   (3)

This course provide an introduction to Bayesian inference and a summary of Bayesian methods for fitting, assessing, and selecting models. Topics include Bayes' Rule and Probability, Binomial Models for Proportions, Poisson Models for Counts, Normal Models for Continuous Data, Linear Regression, Log-linear and Contingency Tables, Hierarchical Models, Hypothesis Testing, Model Comparison, Model Comparison, and Selected Applications.

STA   **Master of Science in Applied Statistics**

STA 656 STATISTICAL QUALITY CONTROL (3)

Dimensions of quality, numerical and graphical descriptions of data, discrete and continuous distributions, basic reliability concepts, control charts for variables and attributes, process capability studies, and selected additional topics as time permits such as cusum charts, acceptance sampling.

STA 659 APPLIED STATISTICAL METHODS (3)

Supervised reading, discussion, and practice of a selected statistical methodological area.