

BST

Biostatistics

#BST 639 COMPUTING TOOLS FOR THE BIOMEDICAL SCIENCES. (3)

This course is an introduction to statistical and epidemiologic software technologies commonly used for the collection, management, and analysis of data. Prereq: STA 580 or consent of instructor and basic computer literacy. (Same as CPH 639.)

#BST 675 BIOMETRICS I. (4)

This course, the first of a two-semester sequence in biometrics, introduces probability, discrete random variables, continuous random variables, joint distributions, and sampling distributions. Prereq: STA 580 and CPH 608.

#BST 676 BIOMETRICS II. (4)

This course, the second of a two-semester sequence in biometrics, introduces techniques for constructing and evaluating point estimators, hypothesis testing procedures, and interval estimators. Prereq: BST 675.

#BST 713 CLINICAL TRIALS. (3)

Design and analysis of Phase I-III clinical trials, interim monitoring of trials, sample size, power, crossover trials, bioequivalency, mixed models, and meta analysis. Prereq: STA 643. (Same as STA 653.)

#BST 740 SPATIAL STATISTICS. (3)

Course will cover risks and rates, types of spatial data, visualizing spatial data, analysis of spatial point patterns, spatial clustering of health events based on case control studies, and based on regional counts, linking spatial exposure data to health events through regression modeling, Bayesian spatial analysis. Prereq: BST 760

#BST 760 ADVANCED REGRESSION. (3)

This course provides an introduction to theoretical methods and applications of linear and generalized linear models. Regression methods for normally distributed outcomes will provide a discussion of experimental design, design matrices, and modes of parametric inference for the linear model. Students will learn to apply these concepts in sophisticated data analysis where they will implement tools for model building and selection, variable selection, and handling categorical predictors, confounders and interactions. Additionally, students will learn polynomial regression and flexible alternatives such as weighted least squares and robust, ridge and nonparametric regression. Regression models for non-normal outcomes (focusing on binomial and count data) will be covered in detail, providing students with foundational tools for understanding and implementing generalized linear models that are commonly used to analyze epidemiologic and public health data from various study designs including but not limited to cohort, case-control, and clinical trials. Prereq: BST 675 and STA 580; coreq: BST 676.

#BST 761 TIME TO EVENT ANALYSIS. (3)

Analysis of time to event data encountered in Public Health and Medicine. Survival distributions and hazard functions. Time to event analysis using Kaplan-Meier method and life-table method. Accelerated failure time model, logit model for discrete data, complimentary log-log model, and proportional hazards model. Tests for goodness-of-fit, graphical methods, and residual and influence statistics. Time-dependent covariates, non-proportional hazards, left truncation, and late entry into the risk set. Sample size and power, competing risks, and time to event analysis with missing data. Prereq: STA 580 or equivalent.

#BST 762 LONGITUDINAL DATA ANALYSIS. (3)

This course presents statistical techniques for analyzing longitudinal studies and repeated measures experiments that occur frequently in public health, clinical trials, and outcomes research. This course will cover linear mixed models, generalized linear mixed models and an introduction to nonlinear models as they apply to the analysis of correlated data. Prereq: BST 676 and BST 760 OR STA 532 and STA 603. (Same as STA 632.)

#BST 763 ANALYSIS OF CATEGORICAL DATA. (3)

Multinomial and product-multinomial models; large-sample theory of estimation and testing, Pearson chi-square and modified chi-square statistics, Pearson-Fisher Theorem, Wald Statistics and generalized least squares technique; applications to problems of symmetry, association and hypotheses of no interaction in multi-dimensional contingency tables. Prereq: STA 603. (Same as STA 665.)